

MAY 2023

DRAFT NWGGA STRATEGIC ASSESSMENT REPORT

PUBLIC EXHIBITION VERSION

PART 1: OVERVIEW

PREPARED FOR THE CITY OF GREATER GEELONG

ACKNOWLEDGEMENT OF COUNTRY

The Country known now as Geelong is the traditional lands of the Wadawurrung, “the people who belong to the water”. Wadawurrung Country spreads from the Great Dividing Range of Ballarat, through to the coast from Werribee to Aireys Inlet. Wadawurrung Country includes the cities of Geelong (Djilang), Ballarat (Ballaarat) and Torquay (Jan Jook).

Open Lines and Biosis acknowledge the Wadawurrung Ancestors who care for and nurture Wadawurrung country. We acknowledge the harm and hardships Wadawurrung people have suffered, and continue to feel today. We acknowledge the Wadawurrung Traditional Owners today, who continue to practice and share their culture and maintain their role in looking after Country.

Contents of the NWGGA Strategic Assessment Report

**PART 1: OVERVIEW**

Chapter 1 – Introduction 1-1

Chapter 2 – Regulatory context 2-1

Chapter 3 – Overview of the Northern and Western Geelong Growth Areas 3-1

Chapter 4 – How to read the Assessment Report 4-1

**PART 2: DESCRIPTION OF THE PLAN**

Chapter 5 – Introduction 5-1

Chapter 6 – Need for the Plan and consideration of alternatives 6-1

Chapter 7 – Development under the Plan 7-1

Chapter 8 – Conservation framework 8-1

Chapter 9 – Assurance and implementation framework 9-1

**PART 3: ASSESSMENT APPROACH**

Chapter 10 – Introduction 10-1

Chapter 11 – Identifying relevant potential impacts 11-1

Chapter 12 – Identifying protected matters 12-1

Chapter 13 – Data used in the assessment 13-1

Chapter 14 – Addressing uncertainty and risk 14-1

Attachment A – Summary of site visits to the Growth Areas A-1

**PART 4: IMPACT ASSESSMENT**

Chapter 15 – Introduction 15-1

Chapter 16 – Avoidance of impacts 16-1

Chapter 17 – Managing indirect impacts 17-1

Chapter 18 – Relevant protected matters 18-1

Chapter 19 – Listed threatened fauna 19-1

Chapter 20 – Listed threatened flora 20-1

Chapter 21 – Listed threatened ecological communities 21-1

Chapter 22 – Ramsar wetlands 22-1

Chapter 23 – Migratory species 23-1

Chapter 24 – Finalised Priority Assessment List (FPAL) 24-1

Chapter 25 – Cumulative impact assessment 25-1

Chapter 26 – Socio-economic impact assessment 26-1

Attachment A – Detailed categorisation and preliminary assessment for protected matters A-1

Attachment B – Background information for the combined fauna assessment: birds B-1

Attachment C – Background information for the combined fauna assessment: fish C-1

**PART 5: EVALUATION**

Chapter 27 – Introduction 27-1

Chapter 28 – Ecologically sustainable development 28-1

Chapter 29 – Evaluation of the Plan’s adequacy 29-1

Maps used in the Strategic Assessment Report

The Assessment Report presents a range of maps which are provided as separate PDF files. These are accessed by clicking on the map links throughout the report and the maps will open in a separate tab in your internet browser.

The table below outlines the maps in the report. Note that the map number is associated with the relevant chapter (for example, Map 3-1 is the first map in Chapter 3).

| **Chapter number** | **Map number** | **File name** |
| --- | --- | --- |
| **PART 1: OVERVIEW** | | |
| 3 | [3-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Locality of the Strategic Assessment Area and Growth Areas |
| [3-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Administrative context of the Study Area, Strategic Assessment Area and Growth Areas |
| [3-3](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | IBRA bioregion boundaries within the Study Area |
| [3-4](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Historic land use within the Strategic Assessment Area |
| [3-5](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Current land use within the Study Area |
| [3-6](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Current land use within the Strategic Assessment Area |
| [3-7](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Existing protected areas within the Study Area |
| [3-8](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Vegetation within Strategic Assessment Area |
| [3-9](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Location of key landforms within the Study Area |
| [3-10](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) | Drainage of development areas within the WGGA and NGGA |
| **PART 2: DESCRIPTION OF THE PLAN** | | |
| 7 | [7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf) | Development land within the Strategic Assessment Area |
| **PART 3: ASSESSMENT APPROACH** | | |
| 13 | [13-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_13_Report_Maps.pdf) | Surveyed and unsurveyed areas of the Growth Areas |
| [13-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_13_Report_Maps.pdf) | Areas of the Growth Areas subject to landholder survey |
| **PART 4: IMPACT ASSESSMENT** | | |
| 19 | [19-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Golden Sun Moth within the Study Area |
| [19-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Golden Sun Moth within the Strategic Assessment Area |
| [19-3](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat Golden Sun Moth within the Strategic Assessment Area |
| [19-4](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Growling Grass Frog within the Cowies Creek corridor |
| [19-5](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Growling Grass Frog within the Study Area |
| [19-6](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Indicative layout of the Cowies Creek Conservation Area |
| [19-7](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Alluvium map |
| [19-8](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Striped Legless Lizard within the Study Area |
| [19-9](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Striped Legless Lizard within the Strategic Assessment Area |
| [19-10](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Australasian Bittern within the Study Area |
| [19-11](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Australian Fairy Tern within the Study Area |
| [19-12](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Australian Painted Snipe within the Study Area |
| [19-13](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Curlew Sandpiper within the Study Area |
| [19-14](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Eastern Curlew within the Study Area |
| [19-15](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Great Knot within the Study Area |
| [19-16](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Greater Sand Plover within the Study Area |
| [19-17](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Lesser Sand Plover within the Study Area |
| [19-18](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Orange-bellied Parrot within the Study Area |
| [19-19](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Red Knot within the Study Area |
| [19-20](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Western Alaskan Bar-tailed Godwit within the Study Area |
| [19-21](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Australian Grayling within the Study Area |
| [19-22](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Eastern Dwarf Galaxias within the Study Area |
| [19-23](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of habitat and records of Yarra Pygmy Perch within the Study Area |
| [19-24](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_19_Report_Maps.pdf) | Occurrence of records of Blue-winged Parrot within the Study Area |
| 20 | [20-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_20_Report_Maps.pdf) | Occurrence of habitat and records of Adamson's Blown-grass within the Study Area |
| [20-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_20_Report_Maps.pdf) | Occurrence of habitat and records of Adamson's Blown-grass within the Strategic Assessment Area |
| [20-3](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_20_Report_Maps.pdf) | Occurrence of habitat and records of Spiny Rice-Flower within the Study Area |
| 21 | [21-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_21_Report_Maps.pdf) | Occurrence of Natural Temperate Grassland of the Victorian Volcanic Plain within the Study Area |
| [21-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_21_Report_Maps.pdf) | Occurrence of Natural Temperate Grassland of the Victorian Volcanic Plain within the Strategic Assessment Area |
| 22 | [22-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_22_Report_Maps.pdf) | Map of Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site |
| [22-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_22_Report_Maps.pdf) | Site map of Point Wilson / Limeburners Bay |
| [22-3](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_22_Report_Maps.pdf) | Site map of The Lake Connewarre Complex |
| [22-4](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_22_Report_Maps.pdf) | Site map of Werribee / Avalon |
| 23 | [23-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Map of Important Bird Areas within the Study Area |
| [23-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records from the past five years (2017-2022) of the Common Greenshank |
| [23-3](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records from the past five years (2017-2022) of the Double-banded Plover |
| [23-4](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records from 1990 onwards of the Double-banded Plover |
| [23-5](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records from the past five years (2017-2022) of Latham's Snipe |
| [23-6](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records from the past five years (2017-2022) of the Marsh Sandpiper |
| [23-7](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records from the past five years (2017-2022) of the Red-necked Stint |
| [23-8](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records from the past five years (2017-2022) of the Sharp-tailed Sandpiper |
| [23-9](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_23_Report_Maps.pdf) | Occurrence in the Study Area of records of Little Tern |
| 25 | [25-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_25_Report_Maps.pdf) | Location of other projects included in the quantitative cumulative impact assessment |
| **PART 5: EVALUATION OF THE OUTCOMES OF THE PLAN** | | |
| There are no maps for Part 5. | | |

Terms and acronyms used in the Strategic Assessment Report

| **Term** | **Acronym / Abbreviation** | **Description** |
| --- | --- | --- |
| **Biodiversity Conservation Strategy** | BCS | The overarching strategy for protecting matters of state environmental significance and national environmental significance. |
| **Catchment Management Authority** | CMA | The regulatory body responsible for integrated planning and coordination of water, land, and biodiversity management within each catchment. |
| **Class of Actions** | CoA | The term used to describe a single group of actions proposed to be undertaken for development under the strategic assessment |
| **Classes of Actions** | CoAs | The term used when referring to all 'class of actions' for the strategic assessment collectively. |
| **Commonwealth Government Department of Climate Change, Energy, the Environment and Water** | DCCEEW | The Commonwealth Government department primarily responsible for environment protection and conservation at a national level. |
| **Commonwealth Minister for the Environment** | The Minister | The Commonwealth Minister responsible for the *Environment Protection and Biodiversity Conservation Act 1999*. |
| **Cowies Creek Conservation Area** |  | The section of Cowies Creek within the WGGA to be protected and managed for conservation purposes under the Plan. |
| **Cumulative impact assessment** | CIA | Cumulative impacts relate to the combined impact of a range of activities within a region. Assessing cumulative impacts recognises that the combined effects of multiple activities on protected matters may be greater than the impact of an individual activity. |
| **Development land** |  | Specified land within the Strategic Assessment Area where development under the Plan is proposed to occur. |
| **Development under the Plan** |  | The broad term used to describe the scope of all development covered by the Class of Actions under the Plan. |
| **Ecological Vegetation Classes** | EVC | The standard unit used to classify vegetation types in Victoria. |
| **Ecologically Sustainable Development** | ESD | 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. An additional definition can be found in Section 3A of the *Environment Protection and Biodiversity Conservation Act 1999*. |
| **Ecology and Heritage Partners** | EHP | The consulting company that completed ecological surveys within the Growth Areas. |
| ***Environment Protection and Biodiversity Conservation Act 1999* (Cth)** | EPBC Act | The Commonwealth Government’s central piece of environmental legislation, which provides a framework to protect and manage Matters of National Environmental Significance. |
| **Extent of occurrence** | EOO | The area contained within the shortest continuous imaginary boundary which can be drawn to encompass all known, inferred, or projected sites of present occurrence of a species or ecological community, excluding cases well outside an entity’s normal distribution. |
| **External infrastructure footprints** |  | Proposed location of land within the Strategic Assessment Area but outside of the Growth Areas that is subject to development under the Plan. |
| **Finalised priority assessment list** | FPAL | List of species, ecological communities, and key threatening processes that have been nominated and approved for assessment and consideration for listing by the Minister responsible for the *Environment Protection and Biodiversity Conservation Act 1999.* |
| **Indirect impacts** |  | Secondary impacts to protected matters which can occur adjacent to or downstream of development from either construction or operational phases of development under the Plan |
| **Interim Biogeographic Regionalisation for Australia subregion** | IBRA subregion | Developed by the Commonwealth Government as a key planning tool to identify land for conservation. It has since become a spatial mapping and information source on vegetation communities and ecosystems across Australia. |
| **Land subject to development** |  | Development land within the Growth Areas subject to all classes of actions under the Plan. |
| **Local Government Authority** | LGA | The regulatory body responsible for managing local government matters. |
| **Matters of National Environmental Significance** | MNES | Defined under the *Environment Protection and Biodiversity Conservation Act 1999* as:   * Listed threatened species and communities * Migratory species * Wetlands of international importance (listed under Ramsar) * Commonwealth marine environment * World Heritage properties * National Heritage places * The Great Barrier Reef Marine Park * Nuclear actions * A water resource, in relation to coal seam gas development and large coal mining development |
| **Native vegetation removal regulations** |  | The Victoria requires a permit to destroy, remove or lop areas of native vegetation. These regulations are referred to as the native vegetation removal regulations and are mostly implemented through the planning schemes for local councils. |
| **NGGA Conservation Area** |  | The area of land within the Northern Geelong Growth Area to be avoided for conservation purposes under the Plan. |
| **Northern and Western Geelong Growth Areas** | NWGGA | The two Growth Areas identified by the City for urban development. |
| **Northern and Western Geelong Growth Areas Framework Plan** | The Framework Plan | The planning document developed by the City to describe the Growth Areas and their future development until 2047. |
| **Northern Geelong Growth Area** | NGGA | One of the two Growth Areas identified by the City for urban development. |
| **Precinct Structure Plan** | PSP | The master plan for a local area to provide a guide for localised investment and development. Precinct Structure Plans incorporate relevant directions outlined in a higher level Framework Plan. |
| **Protected matters search tool** | PMST | A database that identifies whether MNES or other matters protected by the *Environment Protection and Biodiversity Conservation Act 1999* are likely to occur within an area or vicinity. |
| **Ramsar Wetlands** |  | A list of Wetlands of International Importance identified in the Ramsar Convention, which is maintained by the Commonwealth. |
| **State Wide Integrated Flora and Fauna Teams** | SWIFFT | An independent network comprised of community groups, government agencies and authorities, education and research institutes, conservation organisations, and landholders and managers with an interest in threatened species and biodiversity conservation. |
| **Strategic assessment** |  | Landscape-scale assessments undertaken under Part 10 of the *Environment Protection and Biodiversity Conservation Act 1999*. Unlike project-by-project assessments, which look at individual actions, strategic assessments can consider a much broader set of actions over a much larger scale and timeframe, such as a plan, policy, or program. |
| **Strategic Assessment Agreement** |  | The formal agreement between the Commonwealth Minister for Environment and the City of Greater Geelong to enter into the Strategic Assessment for the Northern and Western Geelong Growth Areas. It is a mandatory requirement under the *Environment Protection and Biodiversity Conservation Act 1999*, and formally establishes the expectations of both parties. |
| **Strategic Assessment Area** | SAA | The area subject to assessment of impacts on biodiversity values in the Strategic Assessment Report under the *Environment Protection and Biodiversity Conservation Act 1999*. |
| **Strategic Assessment Report** | SAR | An assessment report done in accordance with the Terms of Reference for the strategic assessment provided under the Strategic Assessment Agreement. See also Strategic Assessment Agreement. |
| **Terms of Reference** | ToR | Terms of Reference are a requirement under the *Environment Protection and Biodiversity Conservation Act 1999* for undertaking a strategic assessment and are prepared in accordance with the Strategic Assessment Agreement. The Terms of Reference outline the requirements for the Strategic Assessment Report, including how impacts to matters of national environmental significance should be assessed and how outcomes of the Plan are evaluated. |
| **The City of Greater Geelong** | The City | The Greater Geelong Local Government Authority. The City is responsible for the implementation of the Part 10 Strategic Assessment. |
| **The Consulting Team** |  | The consultants (including Biosis and Open Lines) commissioned by the City to undertake the Strategic Assessment. |
| **The Northern and Western Geelong Growth Areas EPBC Plan** | The Plan | The Northern and Western Geelong Growth Areas EPBC Plan (the Plan) has been prepared as part of the statutory requirements under Part 10 of the EPBC Act. |
| **The Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site.** | The Ramsar site | The Ramsar site is one of the MNES relevant to the implementation on the Plan. It is a site listed under the Ramsar convention and occurs within the Study Area downstream of the Growth Areas. |
| **Threatened Ecological Communities** | TEC | An ecological community may be listed as vulnerable, endangered, or critically endangered under the *Flora and Fauna Guarantee Act 1988* and/or *Environment Protection and Biodiversity Conservation Act 1999* depending on the level of threat and risk of its collapse. |
| ***Victoria Planning Provisions*** | VPP | Comprehensive planning provisions for reference to construct planning schemes in Victoria. |
| ***Victorian Environment Protection Act 2017*** | EP Act | The Victorian legislation which includes environmental obligations and protections. The EP Act gives the Environmental Protection Authority enhanced authority to prevent impacts to the environment from waste and pollution. |
| ***Victorian Planning and Environment Act 1987*** | P&E Act | The Victorian Government Act which provides a framework for the use and development of land, and urban planning, in Victoria. |
| **Victorian State Department of Environment, Energy and Climate Action** | DEECA | The Victorian Government department responsible for environmental protection and conservation of biodiversity amongst other things. |
| **The former Victorian Government Department of Environment, Land, Water and Planning** | DELWP | The former Victorian Government department responsible for environmental protection, state planning regulation and various other things. The department has since been rearranged and split into DEECA and DTP |
| **Victorian State Department of Transport and Planning** | DTP | The Victorian Government department responsible for regulating state planning policies and frameworks |
| **Western Geelong Growth Area** | WGGA | One of the two Growth Areas identified by the City for urban development. Note that this area excludes the following three precincts which are not included in the Strategic Assessment:   * Batesford South * Merrawarp Road * McCanns Land |

DOCUMENT TRACKING

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| **VERSION CONTROL:** | |
| VERSION: | Public exhibition version |
| DATE: | May 2023 |

Contents of Part 1

[List of Figures xii](#_Toc134688579)

[List of Tables xii](#_Toc134688580)

[PART 1: OVERVIEW 1-1](#_Toc134688581)

[1 Introduction 1-1](#_Toc134688582)

[1.1 The Strategic Assessment 1-1](#_Toc134688583)

[1.2 Purpose of this report 1-1](#_Toc134688584)

[2 Regulatory context 2-1](#_Toc134688585)

[2.1 Environment Protection and Biodiversity Conservation Act 1999 2-1](#_Toc134688586)

[2.2 Other approvals required for the proposed development 2-2](#_Toc134688587)

[3 Overview of the Northern and Western Geelong Growth Areas 3-1](#_Toc134688588)

[3.1 Introduction 3-1](#_Toc134688589)

[3.2 Overview of the Strategic Assessment Area and Growth Areas 3-1](#_Toc134688590)

[3.3 Landscape context 3-2](#_Toc134688591)

[3.4 Key threats 3-14](#_Toc134688592)

[4 How to read this report 4-1](#_Toc134688593)

[4.1 Structure of the report 4-1](#_Toc134688594)

[4.2 Advice about how best to navigate the document in electronic form 4-1](#_Toc134688595)

[4.3 How this report addresses regulatory requirements 4-2](#_Toc134688596)

[References A](#_Toc134688597)

List of Figures

[Figure 2‑1: Key steps in the strategic assessment process 2-3](#_Toc134688598)

List of Tables

[Table 3‑1: Threatened species recorded within the catchments downstream of the Growth Areas 3-12](#_Toc134688599)

[Table 4‑1: SAR part structure and descriptions 4-1](#_Toc134688600)

[Table 4‑2:Where requirements for preparing a SAR are addressed in this Assessment Report 4-2](#_Toc134688601)

PART 1: OVERVIEW

# Introduction

## The Strategic Assessment

The City of Greater Geelong (the City) has identified two key areas for urban growth in Geelong’s northwest, known as the Northern and Western Geelong Growth Areas (the Growth Areas).

The Growth Areas were identified through several State planning strategies for future growth. The City subsequently developed the *Northern and Western Geelong Growth Areas Framework Plan* (the Framework Plan) (The City of Greater Geelong, 2021b), which describes the Growth Areas and outlines considerations for their future development until 2047.

Geelong is considered to be Victoria’s primary growth and population centre outside of Melbourne and contains numerous assets that are vital for the state’s social, economic and environmental sustainability (Victoria State Government, 2017). The Growth Areas are the key areas identified for development to support Geelong’s long-term growth. This growth is driven by a strong economy and employment opportunities that are expected to continue in the coming decades (Geelong Region Alliance, 2007; The City of Greater Geelong, 2021b).

Development within the Growth Areas and associated infrastructure development outside the Growth Areas will lead to impacts to biodiversity values protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and biodiversity values protected under Victorian biodiversity regulations.

To support development in the Growth Areas and protect matters of national environmental significance (MNES), the City is undertaking a strategic assessment under Part 10 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This enables a landscape scale assessment and approval of a suite of development actions under the EPBC Act and provides the opportunity to deliver improved environmental and development outcomes compared to project-by-project assessments through strategic consideration of biodiversity issues.

As part of the strategic assessment process, the City has prepared the *Northern and* *Western Geelong Growth Areas EPBC Plan* (the Plan) (The City of Greater Geelong, 2022). The Plan gives effect to the outcomes of the strategic assessment process and has been prepared in accordance with the Endorsement Criteria under the Agreement to undertake the Northern and Western Geelong Growth Areas strategic assessment (Strategic Assessment Agreement). See Part 2 of this document for a description of the Plan and the associated implementation documents.

The Strategic Assessment Report (SAR) (this document) has been prepared to assess the impacts of the development under the Plan on MNES. The SAR also evaluates the adequacy of the Plan’s outcomes, commitments and measures in protecting MNES over the life of the Plan.

## Purpose of this report

The SAR assesses the potential impacts of the proposed development under the Plan on biodiversity values and other matters regulated under the EPBC Act. The SAR has been prepared in accordance with the Terms of Reference (ToR) provided under the Strategic Assessment Agreement (refer to [this link](https://www.geelongaustralia.com.au/common/public/documents/8d9f0907b4ac1f7-finaltermsofreference-geelonggrowthareasstrategicassessment.pdf) for the ToR and [this link](https://www.dcceew.gov.au/sites/default/files/documents/strategic-assessment-agreement-geelong.pdf) for the Strategic Assessment Agreement) between the Commonwealth Minister for the Environment and the City of Greater Geelong under the EPBC Act (27 January 2022).

The purpose of the SAR is to address the ToR and assess the impacts of the proposed development taken under the Plan on all matters protected by Part 3 of theEPBC Act (protected matters).

The SAR will be considered by the Commonwealth Environment Minister in deciding to endorse the Plan under the EPBC Act. If the Plan is endorsed by the Minister, the Minister may subsequently consider approval of the proposed development in accordance with the endorsed Plan. If approved, development can proceed in the NWGGA without further approval under the EPBC Act, as long as it is undertaken in accordance with the Plan and any conditions of the Part 10 approval under the EPBC Act.

It is important to note that the SAR does not attempt to assess the impacts and outcomes to State biodiversity matters which are regulated at the State level.

# Regulatory context

This Chapter provides an overview of the key steps in the legislative processes for strategic assessments under Part 10 of the EPBC Act. The key steps are shown in Figure 2‑1.

## Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is Australia’s key piece of legislation to protect and manage Australia’s nationally and internationally important biodiversity, environment and heritage places. The objectives of the EPBC Act include:

* Providing for the protection of the environment (specifically MNES)
* Promoting Ecologically Sustainable Development (ESD) through the sustainable use of natural resources
* Promoting the conservation of Australian biodiversity and heritage
* Promoting a cooperative approach to the protection and management of the environment
* Assisting in the cooperative implementation of Australia’s international responsibilities
* Recognising and promoting the role and knowledge of Indigenous people in the conservation and ecologically sustainable use of Australia’s biodiversity

Under Part 10 of the EPBC Act, the Commonwealth Minister for the Environment (the Minister) can agree to undertake a strategic assessment of the impacts of a policy, plan or program on matters protected under the EPBC Act.

The Agreement to undertake the strategic assessment was signed by the City of Greater Geelong and the Minister on 27 January 2022. The Agreement includes Terms of Reference (ToR) to guide the preparation of the Strategic Assessment Report (SAR), as well as a set of Endorsement Criteria to ensure the Plan meets the requirements of the EPBC Act and is able to be adequately implemented (refer to [this link](https://www.geelongaustralia.com.au/common/public/documents/8d9f0907b4ac1f7-finaltermsofreference-geelonggrowthareasstrategicassessment.pdf) for the ToR and [this link](https://www.dcceew.gov.au/sites/default/files/documents/strategic-assessment-agreement-geelong.pdf) for the Strategic Assessment Agreement).

The ToR outline what the SAR must contain to allow the Minister to endorse the Plan. The Strategic Assessment Agreement, SAR and Plan must all be publicly exhibited, and any public submissions need to be considered to finalise the documentation.

The Strategic Assessment Agreement for the Northern and Western Geelong Growth Areas strategic assessment provides that, in determining whether or not to endorse the Plan, the Minister will consider the Plan against the Endorsement Criteria provided in the agreement to ensure the Plan meets the requirements of the EPBC Act and is able to be adequately implemented.

Following endorsement of the Plan, the Minister may approve the taking of actions in accordance with the endorsed policy, plan or program subject to a range of general considerations (s 146F) and constraints on decision making (s 146G-M), including to not act inconsistently with a recovery plan or threat abatement plan for a protected matter (s 146K).

Actions undertaken in accordance with a policy, plan or program endorsed by the Minister do not require further assessment and approval for impacts on protected matters under the EPBC Act. The Minister may endorse a policy, plan or program if satisfied that the Assessment Report adequately addresses the impacts on protected matters to which the agreement relates (s 146(2)(f)) and that any recommended modifications to the policy, plan or program by the Minister have been made (s 146 (2f(ii))).

### Matters of environmental Significance

Matters of National Environmental Significance (MNES) are protected matters under the EPBC Act for which impacts need to be adequately addressed to enable the Minister to endorse a policy, plan or program.

Only a subset of MNES are relevant to this strategic assessment (see Chapter 18: Relevant protected matters for details). They are:

* Wetlands of international importance
* Nationally threatened species and ecological communities
* Migratory species

## Other approvals required for the proposed development

The SAR has been prepared to meet the requirements of the EPBC Act (as discussed above) and does not attempt to assess the impacts and outcomes on State biodiversity matters. However, to enable development to proceed and for successful implementation of the Plan, a range of planning and environmental approvals will be required at the State level, including (but not necessarily limited to):

* Planning approvals under the *Planning and Environment Act 1987*
* Non-Aboriginal heritage approvals under the *Heritage Act 2017*
* Aboriginal cultural heritage approvals under the *Aboriginal Heritage Act 2006*
* Pollution and waste approvals under the *Environment Protection Act 2017*
* Water and waterway related approvals under the *Water Act 1989*

Implementation is described further in the Plan and Part 2 of the SAR.

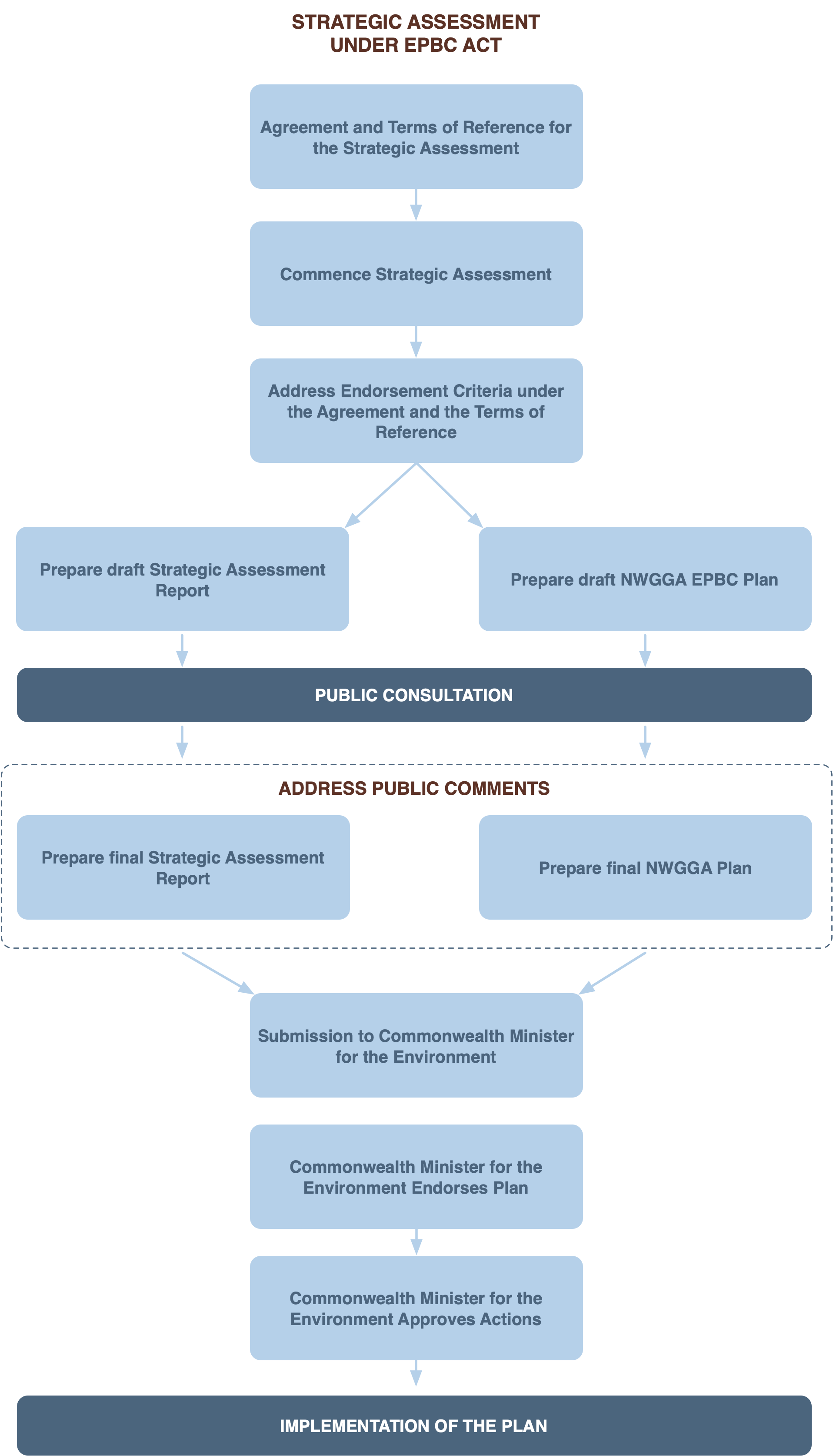


Figure 2‑1: Key steps in the strategic assessment process

# Overview of the Northern and Western Geelong Growth Areas

## Introduction

The strategic assessment proposes development within two Growth Areas, located on the north-western outskirts of Geelong within Victoria. This chapter provides a brief overview of the landscape context of the region, including key environmental values and threats.

More detailed information regarding baseline data, protected matters, and assessments of potential impacts to protected matters under the Plan, are outlined later in the SAR. See Chapter 4 for a detailed outline of where specific information is located within the SAR.

The relevant items in the ToR relating to the overview of the Growth Areas are outlined in the following text box:

*3.1. The Report must describe the nature of the environment within the strategic assessment area that may be impacted by actions proposed to be taken under the Plan. This must include (at a minimum):*

*a) a description and map of current and historical land-use, including consideration of areas which may pose an environmental risk*

*b) a description of indigenous land-use and values*

*c) the broad extent, type and quality of vegetation present in the strategic assessment area, where such information is available or is required in the relevant EPBC Act statutory document for a protected matter (such as a recovery plan)*

*d) a description of the nature of the terrestrial and aquatic environment, including the state of natural and physical resources, ecological processes, and threatening processes*

*e) a description of relevant state-protected environmental and heritage values*

*f) a description of the landscape context and key environmental matters, such as any known habitat connectivity, habitat fragmentation, and ecological processes*

*g) map or maps of areas that are already protected, including national parks, nature reserves, and known offset areas under both Commonwealth and/or State legislation*

*…*

*i) the location of any declared World Heritage properties or National Heritage places in the strategic assessment area and identification of sensitive heritage areas for protected matters*

## Overview of the Strategic Assessment Area and Growth Areas

The area covered by the Plan is called the Strategic Assessment Area.

The Strategic Assessment Area occurs within the Victorian Volcanic Plains Bioregion.

It covers 7,101 ha and includes:

* The Northern Geelong Growth Area (NGGA) which covers 2,103.9 ha and occurs in the Lovely Banks locality
* Two precincts within the Western Geelong Growth Area (WGGA) which cover 767.2 ha and occur in the Bell Post Hill/Batesford localities

The NGGA and WGGA are identified in the Framework Plan. The Strategic Assessment Area includes the entire NGGA as described in the Framework Plan but only the northern portion of the WGGA. The portion of the WGGA included in the Strategic Assessment Area comprises the Creamery Road precinct and Batesford North precinct.

The remaining section of the WGGA identified in the Framework Plan covers 2,472.3 ha and has been excluded from the strategic assessment due to a lack of information and resolution relating to a range of factors needed to support and rationalize a full assessment and approval under the EPBC Act. This includes the anticipated development demand and timing, and the detailed plans for decommission and rehabilitation of the active Batesford Quarry.

The Strategic Assessment Area also includes external infrastructure development outside of the Growth Areas, which are required to support development within the Growth Areas and help deliver the development objectives of the Framework Plan. External infrastructure development is described further in Section 7.4 of Part 2.

Refer to [Map 3-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the locality and layout of the Study Area, Strategic Assessment Area and the Growth Areas.

### Locality

The Strategic Assessment Area occurs towards the northern half of the city of Geelong in southern Victoria, south-west of Melbourne on the western shoreline of Port Phillip Bay.

The Strategic Assessment Area boundary extends to the southern Anakie locality in the north, to the Moorabool locality in the west, and south to the Batesford locality. The eastern boundary of the Strategic Assessment Area is irregular, with two arms extending east, the southern arm capturing the region surrounding Cowies Creek to the shore of Corio Bay, and the northern arm occurring to the north of Geelong Ring Road and extending towards the Princes Freeway.

A 20 km buffer around the Strategic Assessment Area has been used to identify protected matters which may be impacted by the Plan. This area is called the Study Area.

### Administrative context

Both of the Growth Areas occur wholly within the boundaries of the Greater Geelong City LGA. A small area of the Strategic Assessment Area (to the west of WGGA) extends into the neighbouring Golden Plains Shire LGA, otherwise the remainder of the Strategic Assessment Area is located within the Greater Geelong City LGA. The Study area occurs across the Greater Geelong City, Golden Plains Shire, Moorabool Shire, Surf Coast Shire, and Wyndham City LGAs.

The Strategic Assessment Area is wholly contained within the Corangamite Catchment Management Authority (CMA) region. The majority of the Study Area occurs within the Corangamite CMA, with the northern area extending into the Port Phillip and Westernport CMA.

Refer to [Map 3-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the administrative context of the Study Area.

## Landscape context

This section sets out the landscape context for the strategic assessment. It provides brief descriptions of:

* Relevant IBRA bioregions
* Climate of the region
* Geology and soil
* Historical and current land uses
* Heritage values
* Terrestrial environmental values of the strategic assessment area
* Topography and surface hydrology
* Groundwater characteristics and connectivity
* Water-based environmental values

### IBRA bioregions

The region surrounding Geelong includes multiple IBRA bioregions, reflecting the diversity of environments present within the wider landscape. Each of the IBRA regions present, and their relationship to the Strategic Assessment Area, is outlined below.

Refer to [Map 3-3](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the IBRA bioregion boundaries of the Study Area.

#### Southern Victorian Volcanic Plain bioregion

The Strategic Assessment Area itself is wholly contained within the Southern Volcanic Plain bioregion.

The Southern Volcanic Plains bioregion mostly occurs in Victoria (hence it was previously known as the Victorian Volcanic Plains bioregion), yet it is now recognised to extend into South Australia. It stretches from Melbourne in the east to the Mt Gambier region in the west. The bioregion is characterised by broad basaltic plains, interspersed with areas of lakes and swamps. Native grasslands occur in areas where basalts are older and more weathered to produce heavy clays which are generally fertile yet poorly drained. Younger occurrences of relatively unweathered lava flows occur as stony rises, and support thin soils and woodland vegetation (Dahlhaus *et al.*, 2003; Williams, 2022).

#### South-east Coastal Plain bioregion

To the south and downstream of sections of the Strategic Assessment Area is the Otway Plains subregion of the South-East Coastal Plain bioregion.

The South-East Coastal Plain bioregion is comprised of undulating Tertiary and Quaternary coastal plains and hinterlands, and ranges from Tyrendarra in the west to Lakes Entrance in the east. The Otway Plain subregion includes coastal plains, river valleys and foothills from the Bellarine Peninsula, west to Princetown (Environment Australia, 2000).

The South-East Coastal Plain bioregion as a whole includes a wide variety of vegetation, ranging from lowland forests, grasslands and grassy woodlands, heathlands, shrublands, freshwater and coastal wetlands, mangrove scrubs, saltmarshes, dune scrubs and coastal tussock grasslands (Environment Australia, 2000).

#### Victorian Midlands bioregion

The Victorian Midlands bioregion occurs in the region as higher elevation, wooded areas to the north-east and north-west of the Strategic Assessment Area (including the Brisbane Ranges National Park and You Yangs Regional Park). The closest boundaries of this bioregion to the Strategic Assessment Area occur approximately 8.5 km to the north-east and 6 km to the north-west.

This bioregion comprises extensive areas of isolated ranges and foothills which make up the lower inland slopes of the Great Dividing Range and extends from north-eastern Victoria to Casterton in Western Victoria. Vegetation within this bioregion mostly comprises Eucalyptus forests and woodlands. Flatter and more fertile occurrences of this bioregion have been substantially cleared for agriculture or impacted by timber harvesting. In less fertile areas of this bioregion, substantial areas of native vegetation remain in good condition (Environment Australia, 2000).

### Climate

Geelong is located within a temperate climate zone, with dominant westerly winds, variable cloud cover, moderate rainfall and cool temperatures (Agriculture Victoria, 2020).

Geelong experiences average annual rainfall of around 550 mm. Summer temperatures range from average daily maximum temperatures of 24.6oC to average daily minimum temperatures of 13.2oC. Winter temperatures range from average daily maximum temperatures of 14.4oC to average daily minimum temperatures of 5.6oC (Agriculture Victoria, 2020).

The region’s climate is predicted to change as a result of climate change, with predicted increases in maximum and minimum daily temperatures, increased variability in rainfall (with lower winter, spring and autumn rainfall, and increased extreme rainfall events), and increases in the length of the fire danger season (The City of Greater Geelong, 2021a).

### Geology and soil

The Victorian Volcanic Plains was created by volcanic activity which occurred between approximately 4.5 million to 10,000 years ago. Volcanic activity was mostly from many small volcanoes which created lava flows of basalt, which filled in valleys and created broad plains. There are some occurrences of more explosive eruptions in the region which created circular craters which today contain lakes and swamps (Williams, 2022).

Today, the geology of the Strategic Assessment Area is dominated by areas of basalt, interspersed with areas of alluvial deposits (associated with the Moorabool River) and aeolian deposits (associated with Cowies Creek). The areas of basalt are characterised as plains with poorly developed drainage and with shallow bedrock. Aeolian deposits tend to be characterised as plains with unconsolidated sedimentary deposits, and areas of alluvium are described as unconsolidated sediment occurring as terraces, floodplains, and coastal plains (DELWP, 2022).

### Historical land uses, heritage and current land uses

#### Indigenous historical land use and heritage values

The traditional owners of the land are the Wadawurrung Aboriginal people, a recognised tribe consisting of 25 clans (family groups), which form part of the larger Kulin Nation of Aboriginal people. The Country known now as Geelong was occupied for at least 45,000 years by traditional owners prior to European Settlement (Rowe, 2021).

There are a number of registered Aboriginal places across the Growth Areas, comprised mostly of stone artefacts. There has been limited archaeological investigation within the Growth Areas, and the available data may not accurately reflect land use by the Wadawurrung people. Preliminary Aboriginal site sensitivity mapping has indicated areas of high archaeological potential along the waterways on the WGGA and one area in the NGGA near to a registered stone artefact (The City of Greater Geelong, 2021b).

Section 26.3 of Part 4 provides further information about the Wadawurrung people.

#### European historical land use and heritage values

The open and fertile Southern Volcanic Plains bioregion was quickly colonised by European settlers in the 1830’s and 1840’s (Dahlhaus *et al.*, 2003). As part of this bioregion, the Geelong locality has experienced substantial historical agricultural development.

The city of Geelong itself also has a long history of development. It was first proclaimed as a town in 1838 (Monument Australia, 2010). A rail link was established between Geelong and Melbourne in 1857, and since the 1930’s, Geelong has been the second largest city in Victoria (Victorian Places, 2015).

Refer to [Map 3-4](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing historical land uses within the Strategic Assessment Area, as indicated by aerial photographs of the region from 1947.

Post contact heritage values in the NGGA are mostly related to the early settlement of large pastoral estates, and the eventual subdivision to small-scale freehold agricultural enterprises. Post contact heritage values within the WGGA are related to early settlement of large pastoral estates, rail and road infrastructure, quarrying and the history of the Fyansford and Batesford townships (The City of Greater Geelong, 2021b).

Section 26.3 of Part 4 provides further information about post European settlement.

##### World Heritage Properties and National Heritage Places

There are no World Heritage Properties or National Heritage Places within the Strategic Assessment Area or wider Study Area.

##### State heritage places

There are two state heritage places within the Growth Areas. These include (The City of Greater Geelong, 2021b; Heritage Council Victoria, 2022):

* The Elcho Homestead, a Gothic homestead constructed in 1867, located in the north-east of the NGGA
* The bridge over Moorabool River, one of the earliest and longest stone arch road bridges in Victoria, constructed in 1859, located in the south-east corner of the WGGA

Outside of the Growth Areas and within the wider strategic assessment area, there are an additional seven state heritage places (Heritage Council Victoria, 2022):

* Cowies Creek Rail Bridge No1, a two-span segmental arch bluestone railway bridge constructed in 1860
* Cowies Creek Rail Bridge No2, a single span semicircular arch bluestone bridge constructed in 1860
* Ford Motor Company Complex, comprising of two steel-framed factory buildings with attached offices
* Former Moorabool Railway Station, a historical railway station constructed in 1861
* Former Travellers Rest Inn, an inn with a Colonial Georgian structure which was erected in 1849
* Laurence Park Homestead – a ‘H’ shaped colonial building constructed in 1845
* Railway Viaduct – a 396 m railway viaduct constructed over the Moorabool River in 1862

#### Current land use

Today, the Strategic Assessment Area primarily includes land which has been developed for agricultural purposes. The NGGA is primarily used for pastoral and cropping activities, associated with rural residential housing. The WGGA includes a mix of existing land uses, including agriculture, recreation reserves, Council-managed reserves, rural and medium density housing, and educational facilities. While the WGGA does not contain any formal conservation reserves, there are a number of reserves managed by the City – including the Moorabool River Reserve (EHP, 2021).

The city of Geelong is a large urban centre and supports a population of over 250,000, which is forecast to be nearly 400,000 by the early 2040’s (Corangamite CMA, 2022a).

Refer to [Map 3-5](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a larger scale map showing current land uses across the wider Study Area, and [Map 3-6](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a more detailed map showing current land uses within the Strategic Assessment Area.

### Protected areas

The Strategic Assessment Area occurs within the Southern Volcanic Plain bioregion. Due to substantial agricultural development, this bioregion has become one of the bioregions most depleted of native vegetation in Victoria. As of 2003, only 4.5 per cent of the bioregion still had a cover of native vegetation. Further, as of 2003, less than 1.2 per cent of the Southern Volcanic Plains bioregion was in a formal conservation reserve (DSE, 2003).

There are minimal protected areas within the Strategic Assessment Area, including:

* Cowies Creek Frontage – A small (approximately 0.9 ha) Natural Feature Reserve occurring adjacent to Cowies Creek downstream from the WGGA
* Moorabool River Water Frontage – A Natural Feature Area which follows the Moorabool River, occurring adjacent to the WGGA and within the southern edge of the Strategic Assessment Area

There is one national park, the Brisbane Ranges National Park, that occurs partially within the Study Area approximately 15 km north of the Strategic Assessment Area. There are a number of protected areas across the broader Study Area, including:

* Inverleigh Nature Conservation Reserve – approximately 18.6 km north of the Strategic Assessment Area
* Serendip Wetlands Educational Facility – approximately 4 km north-east of the Strategic Assessment Area
* Lake Connewarre Wildlife Reserve -approximately 10.7 km south-east of the Strategic Assessment Area
* Limeburners Lagoon - approximately 1.3 km east of the Strategic Assessment Area
* The Spit Nature Conservation Reserve - approximately 9.2 km east of the Strategic Assessment Area
* The Western Grasslands Reserve - approximately 17 – 18 km north-east of the Strategic Assessment Area
* You Yangs Regional Park – approximately 5 km north of the Strategic Assessment Area
* Dog Rocks Flora and Fauna Sanctuary - approximately 0.2 km south of the Strategic Assessment Area

Refer to [Map 3-7](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the existing protected areas of the Study Area.

### Terrestrial environmental values of the Strategic Assessment Area

#### Overview

The condition of the environment within the Strategic Assessment Area varies and is mostly degraded. Most of the area is highly modified due to agricultural land use and is largely dominated by non-native species. Native vegetation and terrestrial fauna habitat are limited to areas which have not been historically subject to cropping, and to riparian corridors. Where native vegetation is present, much of it is highly modified with a low diversity of native species and lacking in suitable vegetation structure (EHP, 2021).

Despite this, the Strategic Assessment Area supports a range of terrestrial environmental values including habitat for threatened species and TECs, typically in areas which have been subject to reduced levels of historical disturbance. The threatened species and TECs contained within the Strategic Assessment Area are described below.

The existing level of disturbance within the Strategic Assessment Area is consistent with the broader landscape trend within the Southern Volcanic Plains Bioregion, where the vast majority of the bioregion has been developed for agriculture (DSE, 2003).

#### Description of native vegetation communities within the Strategic Assessment Area

Refer to [Map 3-8](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the distribution of native vegetation within the Growth Areas and the Strategic Assessment Area.

##### Native vegetation within the Growth Areas

###### Threatened ecological communities

A total of 1,409.4 ha (67 per cent) of the NGGA and 666 ha (86.8 per cent) of the WGGA was subject to site surveys. The following TECs were identified within the surveyed areas of the NGGA (EHP, 2021):

* 12.7 ha of the Commonwealth listed TEC Natural Temperate Grassland of the Victorian Volcanic Plain
* 123.8 ha of the State significant ecological community Western Basalt Plains Grassland

No TECs (either Commonwealth listed or State listed) were identified within the surveyed areas of the WGGA (EHP, 2021).

A total of 694.5 ha (33 per cent) of the NGGA and 101.2 ha (13.2 per cent) of the WGGA have not been surveyed. These areas generally comprise many small, rural residential landholdings which are fragmented by windrows/landscaping and have a much higher proportion of land use for dwellings and driveways compared to the broader Growth Areas. The environment within these unsurveyed areas tends to be more modified or degraded as a result. It is possible that these unsurveyed areas contain additional patches of native vegetation, and additional Natural Temperate Grassland may occur in the unsurveyed areas of the NGGA (EHP, 2021). See Section 13.3.2 of Chapter 13 for more details on the unsurveyed areas, and Section 21.1.1 of Chapter 21 for a description of Natural Temperate Grassland in the unsurveyed areas.

###### Ecological Vegetation Classes

Within the surveyed areas of the NGGA 146.4 ha of *Low Rainfall* Plains Grassland (EVC 132\_63) was recorded (EHP, 2021). Within the surveyed areas of the WGGA a total of 69.5 ha of native vegetation was recorded. This includes (EHP, 2021):

* 23.1 ha of Floodplain Riparian Woodland (EVC 56)
* 4.9 ha of Creekline Grassy Woodland (EVC 68)
* 41.5 ha of *Low rainfall* Plains Grassland (EVC 132\_63)

Some additional patches of native vegetation may also occur within the unsurveyed areas of the Growth Areas (EHP, 2021).

##### Native vegetation outside of the Growth Areas within the Strategic Assessment Area

Modelled EVCs (DELWP, 2005) across the Strategic Assessment Area and broader Study Area indicate that the Study Area contains a range of native vegetation types. Vegetation is relatively fragmented across the landscape, reflecting the historical and current agricultural land use, and urbanised areas. Some large patches of native vegetation occur in protected areas such as the Brisbane Ranges National Park, You Yangs Regional Park, and in areas of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site.

#### Description of threatened species within the Strategic Assessment Area

###### Threatened flora

Targeted surveys for six Commonwealth listed threatened flora species were undertaken within the Growth Areas, including: *Lachnagrostis adamsonii* (Adamson’s Blown-grass)*, Dianella amoena* (Matted Flax-lily)*, Glycine latrobeana* (Clover Glycine)*, Rutidosis leptorrhynchoides* (Button Wrinklewort)*, Senecio macrocarpus* (Large-fruit Fireweed) and *Pimelea spinescens* subsp. *spinescens* (Spiny Rice-flower).No Commonwealth listed threatened flora species were recorded within the surveyed areas, although, *Lachnagrostis adamsonii* (Adamson's Blown-grass) has been assumed to be present in WGGA based on relatively recent historical records, and the presence of suitable habitat (EHP, 2021).

It is considered highly unlikely that any additional Commonwealth listed flora species occur within the areas which were surveyed within the Growth Areas due to the ongoing land use of the site resulting in the absence of suitable habitat, and the highly modified condition of the understory (EHP, 2021).

One state listed flora species, *Maireana aphylla* (Leafless Bluebush) was recorded at the north-eastern boundary of the NGGA. Known records of *Eucalyptus leucoxylon* subsp. *connata* (Melbourne Yellow-gum) were confirmed to occur approximately 1 km south of the WGGA (EHP, 2021).

On site surveys have not been conducted in the Strategic Assessment Area outside the Growth Areas. There are several records of *Lachnagrostis adamsonii* (Adamson’s Blown-grass) associated with Cowies Creek outside of the WGGA. One additional Commonwealth listed threatened flora species, *Pimelea spinescens* subsp. *spinescens* (Spiny Rice-flower) has been recorded within the Strategic Assessment Area, east of the NGGA.

###### Threatened fauna

Targeted surveys for the following Commonwealth listed threatened fauna species were undertaken within the Growth Areas, *Synemon plana* (Golden Sun Moth), *Delma impar* (Striped Legless Lizard), *Litoria raniformis* (Growling Grass Frog), *Prototroctes maraena* (Australian Grayling) and *Galaxiella toourtkoourt* (Little Galaxias) (EHP, 2021).

Surveys recorded the Striped Legless Lizard and Golden Sun Moth within the NGGA. Growling Grass Frogs were recorded in Cowies Creek within the WGGA. Targeted surveys for the Australian Grayling and Little Galaxias within the WGGA did not identify the species. However, the Australian Grayling is considered likely to be present within the broader catchment area. It is noted that the Corangamite CMA has proposed to remove barriers within the Moorabool River which currently prevent fish accessing habitat further upstream adjacent to the WGGA. Future planning for the WGGA PSPs should assume the presence of the Australian Grayling and Little Galaxias following the removal of these barriers (EHP, 2021).

A single state significant fauna species *Aythya australis* (Hardhead) was observed within the NGGA during surveys, although it is considered unlikely that the species would maintain a resident population within the Growth Areas. *Ardea modesta* (Eastern Great Egret) and *Falco subniger* (Black Falcon) have recently been recorded in close proximity to the Growth Areas, and it is likely that these species would use to the Growth Areas for opportunistic forage, or as a steppingstone throughout the broader landscape. An active *Ornithorhynchus anatinus* (Platypus) burrow was observed within the Moorabool River. The NGGA is considered to support suitable habitat for the *Pseudemoia pagenstecheri* (Tussock Skink), although the species was not recorded during Striped Legless Lizard surveys (EHP, 2021).

On site surveys have not been conducted in the Strategic Assessment Area outside the Growth Areas. Commonwealth listed threatened fauna species which have been recorded within the Strategic Assessment Area include, *Callocephalon fimbriatum* (Gang-gang Cockatoo), *Delma impar* (Striped Legless Lizard), *Litoria raniformis* (Growling Grass Frog), *Macquaria australasica* (Macquarie Perch), and *Synemon plana* (Golden Sun Moth).

### Other landforms connected to the Strategic Assessment Area

While the Strategic Assessment Area itself is comprised largely of basaltic plains, there are a variety of other landforms within the region which are connected to the Strategic Assessment Area by virtue of being downstream. These include:

* Riparian environments (such as those of the Moorabool and Barwon Rivers)
* Wetlands (such as Limeburners Bay and the Lake Connewarre Complex)
* An estuary (Corio Bay, which is connected to Port Phillip Bay)

The degree to which each of these landforms is connected to the Strategic Assessment Area varies, depending strongly upon the topographical and hydrological characteristics of the landscape, and the distance of the landform from the Strategic Assessment Area.

Refer to [Map 3-9](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the locations of each of these landforms.

### Topography and surface hydrology

The Strategic Assessment Area occurs within the Moorabool River Basin. The broader Study Area spans across the Moorabool Basin in the north, the Barwon River Basin in the south, and a small area of the Otway Coast Basin in the southern edge of the Study Area.

There are three catchments which the Growth Areas are hydrologically linked to via overland flow:

* Moorabool River catchment, which occurs to the south of the Strategic Assessment Area. The Moorabool River flows south, joining the Barwon River at Fyansford. The Barwon then continues to flow south, into the Lake Connewarre Complex. This wetland complex then drains into the ocean at Barwon Heads
* Hovells Creek catchment, which occurs to the east of the northern half of the Strategic Assessment Area. This catchment contains Limeburners Bay, and drains southward into Corio Bay
* Cowies Creek catchment, which occurs to the east of the central and southern half of the Strategic Assessment Area. This creek does not contain wetlands and drains eastward into Corio Bay

Refer to [Map 3-10](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the drainage of the Growth Areas to each of these catchments.

The topography of the NGGA is varied. A largely flat, elevated area occurs in the north-western and central areas of the Growth Area. Along the eastern section of the Growth Area, an escarpment occurs, with the landscape falling steeply towards the east, draining into the Hovells Creek catchment, upstream of Limeburners Bay. In the south-west of the Growth Area, the land slopes downwards towards the south-west, draining into the Cowies Creek catchment.

The topography of the WGGA is also varied. The central area of the WGGA is largely flat. The north-eastern corner of the Growth Area slopes towards the north-east, draining into the Cowies Creek catchment. The western section of the Growth Area is steep and drains westwards, into the catchment of the Moorabool River. A small section of the south-eastern corner of the Growth Area slopes gently towards the south-east, also flowing into the catchment of the Moorabool River.

The characteristics and environmental values of each of the catchments and the estuary connected to the Growth Areas is outlined in Section 3.3.10.

### Groundwater characteristics and connectivity

Groundwater is present within the Geelong locality. The characteristics of groundwater systems vary depending upon the geological characteristics of the landscape, ranging from small, local systems where water tables rise and fall quickly, through to large, regional aquifers which operate at a basin scale and are very slow to respond to landscape change (Dahlhaus, Cox et al., 2008).

The volcanic basalt plains which dominate the Strategic Assessment Area are associated with very large-scale aquifers with high permeability and slow response times to land use change (Dahlhaus *et al.*, 2008).

However, it is noted that Hovells Creek (including Limeburners Bay) and sections of the Barwon River (including the Lake Connewarre Complex) are characterised by local groundwater systems (Dahlhaus *et al.*, 2008). It is possible that groundwater interactions with surface water play an important role in the hydrological characteristics of these systems.

### Water-based environmental values

As outlined in Section 3.3.8, the Growth Areas are hydrologically connected to three catchments:

* Hovells Creek catchment, which flows into Limeburners Bay and the Corio Bay estuary
* Cowies Creek catchment, which flows into the Corio Bay estuary
* Moorabool River catchment (which then flows into the Barwon River, followed by the Lake Connewarre Complex, and eventually into the ocean at Barwon Heads)

Refer to [Map 3-9](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf) for a map showing the locations of each of these catchments.

A description of these environments is provided below.

#### Hovells Creek catchment

Hovells Creek is the principal waterway of the Hovells Creek catchment. The majority of the creek’s catchment is agricultural, with some areas of conservation reserves and urban development. In the north, the headwaters of Hovells Creek extends up towards the Anakie locality. The creek flows through a largely agricultural landscape, then flows along the western boundary of You Yangs Regional Park, before flowing through the centre of the township of Lara. Downstream of Lara, the creek widens to flow into Limeburners Bay (part of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site). The north-eastern section of the Strategic Assessment Area and approximately 52 per cent of the NGGA will drain to the Hovells Creek Catchment (The City of Greater Geelong, 2016).

Based on 2010 data, the state-wide Index of Stream Condition found that the Hovells Creek was in ‘very poor’ environmental condition (the lowest environmental condition category in the rating system). This index takes into account a range of environmental indictors, including hydrology, physical form, riparian vegetation, water quality and aquatic life (macroinvertebrates). Contributors to the degraded state of Hovells Creek include agricultural and urban impacts to riparian zones and water quality, reduced riparian vegetation width and connectivity, degraded riparian and estuarine vegetation and reduced estuary extent, barriers to fish passage and changes to flow regime (Corangamite CMA, 2014).

The section of Hovells Creek which is downstream of the NGGA is the section which is downstream of Lara, and includes Limeburners Bay. Limeburners Bay is an internationally significant wetland which includes a range of aquatic vegetation communities and provides key habitat for birds and amphibians (including migratory and threatened species), in addition to a range of recreational values (Corangamite CMA, 2014).

Table 3‑1 identifies the Commonwealth listed threatened species which have been recorded in Hovells Creek and Limeburners Bay.

Further details on the environmental values of Limeburners Bay is provided in Chapter 22 of Part 4, which provides a detailed overview and assessment of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site.

#### Cowies Creek catchment

Cowies Creek is a small creek, whose catchment occurs between Hovells Creek catchment (to the north-east) and the Moorabool River catchment (to the west and south). The upstream areas of the catchment extend into the Moorabool locality and include agricultural land. Downstream and to the west of the Princes Freeway, Cowies Creek traverses through heavily urbanised areas within the North Geelong locality, before discharging into Corio Bay. Most of the stream length occurs in urban areas. The Cowies Creek catchment occurs in the southern half of the Strategic Assessment Area. Approximately 25 per cent of the NGGA and 61 per cent of the WGGA drains to Cowies Creek (The City of Greater Geelong, 2016).

Cowies Creek is a densely vegetated riparian corridor with remnant Creekline Grassy Woodland (EVC 68) occurring along most of the creek. Cowies Creek supports a range of biodiversity values including a significant population of Growling Grass Frog (*Litoria raniformis*). The corridor is also known to support the Eastern Longneck Turtle (*Chelodina longicollis*). Cropping in adjacent upstream areas of the creek has implications for water quality, with salinity and turbidity in the corridor restricting access to viable habitat for some species (GbLA Landscape Architects, 2022).

Table 3‑1 identifies the Commonwealth listed threatened species which have been recorded in Cowies Creek.

#### Moorabool River catchment

The Strategic Assessment Area occurs entirely within the Moorabool Basin.

The Moorabool River occurs adjacent to the western border of the WGGA and continues south to into the Barwon River and Lake Connewarre Complex. The sections of the Moorabool River which are adjacent to and downstream of the WGGA contain multiple environmental values, including the environmental values of the Moorabool and Barwon Rivers and the Lake Connewarre Complex. Approximately 39 ha of the WGGA will drain into the Moorabool river adjacent to the WGGA. A small section (~ 2 per cent) of the NGGA is hydrologically linked to the Moorabool river via Sutherland Creek (The City of Greater Geelong, 2016).

The Moorabool River, Barwon River, and Lake Connewarre Complex are described below.

##### Values of the Moorabool River and Barwon River

The Moorabool River and Barwon River support a diversity of flora and fauna. The Moorabool river is an important biodiversity habitat corridor between the Brisbane Ranges National Park and the Barwon River, and sustains critical ecological processes for native fish, macroinvertebrates, mammals, birds, and vegetation communities (Corangamite CMA, 2016). The Barwon River supports aquatic vegetation communities and provides important breeding and feeding habitat for wetland dependant birds and native fish (Corangamite CMA, 2014).

The condition of the Moorabool and Barwon River is impacted heavily by land use upstream from the Geelong locality. Upstream water extraction has led to significantly reduced flows in both rivers. This trend in declining flow is predicted to continue with climate change. Further, agriculture and land clearing in the upstream catchment reaches has resulted in increased river turbidity and nutrient loads, causing algal blooms and reduced fish habitat (Corangamite CMA, 2022b).

Where the Barwon River flows through Geelong, much of the river is bordered by parkland which is valued and actively used by residents for a range of recreational activities including fishing, water skiing, angling, rowing and paddle sports, and major on-water events. During hot and dry summers, regular algal blooms can disrupt the enjoyment and use of the river for weeks to months (Barwon River Ministerial Advisory Committee, 2020).

The natural water flows of the lower Barwon within Geelong have been substantially disturbed since settlement. A weir (which was first constructed in 1898) is located where the Barwon River discharges into the Lake Connewarre Complex, which prevents the incursion of saline water upstream, and has raised the river level upstream (Barwon River Ministerial Advisory Committee, 2020).

Based on 2010 data, the state-wide Index of Stream Condition found that the Moorabool River and Barwon River segments downstream of the Strategic Assessment Area were in ‘very poor’ environmental condition (Corangamite CMA, 2014). In the past decade, there has been significant progress to improve the flows and waterway management in the Barwon catchment to improve the environmental condition of the river (Barwon River Ministerial Advisory Committee, 2020).

Table 3‑1 identifies the Commonwealth listed threatened species which have been recorded in the Barwon and Moorabool Rivers.

##### Lake Connewarre Complex

South of Geelong, the Barwon River flows into the Lake Connewarre Complex. This complex includes a series of wetlands, including Lake Connewarre, Reedy Lake, Hospital Swamp, and Murtnaghurt Lagoon. The wetland is an estuarine system which supports a diverse range of aquatic vegetation communities and provides important feeding and breeding grounds for a wide range of native fish, wetland birds, migratory birds, and threatened species (Corangamite CMA, 2014).

The Lake Connewarre Complex is important both culturally and socially. The site is significant for the Wadawurrung people, the traditional owners of Geelong. The area is also used recreationally for fishing (with a recreational fishing licence), small craft boating (such as canoes, kayaks, and small fishing boats) and duck hunting within designated areas during duck hunting season (March to June) (DELWP, 2020).

Further details on the environmental values of the Lake Connewarre Complex are provided in Chapter 22 of Part 4, which provides a detailed overview and assessment of the Port Phillip Bay and Bellarine Peninsula Ramsar Site. Table 3‑1 identifies the EPBC listed threatened species which have been recorded in the Lake Connewarre Complex.

#### Corio Bay estuary

Corio Bay is a small bay on the western edge of Port Phillip Bay. Port Phillip Bay is the largest marine embayment in Victoria, covering approximately 1930 km2 with a coastline of 333 km in length. While the maximum depth of Port Phillip Bay is 24 m, the majority of the bay (including Corio Bay) is shallower than 8 m (Walker, 1999; DELWP, 2017). Corio Bay occurs to the east of the Strategic Assessment Area.

Drainage into Corio Bay from the Growth Areas will occur through three drainage pathways (The City of Greater Geelong, 2016):

* Wharf Road and St Georges drainage system - 21 per cent of the NGGA
* Hovells Creek and Limeburners Bay – 52 per cent of the NGGA
* Cowies Creek – 25 per cent of the NGGA, and 61 per cent of the WGGA

Cumulatively, a total of 98 per cent of the NGGA and 61 per cent of the WGGA will drain to Corio Bay.

Port Phillip Bay is connected to the ocean via a narrow entrance at Port Phillip Heads. The narrow entrance limits water exchange between the ocean and the bay. Movement of water is important for dispersing water from the bay to ocean, including freshwater, nutrients, and sediments. However, the efficiency of mixing and flushing across the wider bay varies. Due to its location, depth and other hydrodynamic characteristics, Corio Bay has limited mixing and flushing (DELWP, 2017).

Environmental management of Port Phillip Bay, including Corio Bay, is guided by the Port Phillip Bay Environmental Management Plan 2017-2021. This plan outlines a range of priorities, including ensuring nutrient and sediment loads do not exceed current levels, reducing pollutant loads, reducing litter, managing marine pests, and conserving and restoring habitats and marine life (DELWP, 2017).

Corio Bay has a range of significant environmental values. The northern shoreline of Corio Bay is comprised of two areas of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site, Point Wilson / Limeburners Bay area, and Werribee River / Avalon. The point Wilson / Limeburners Bay area supports a seagrass community and is recognised to provide significant habitat for native and migratory species (DELWP, 2017). Further details and assessment of the environmental values of this Ramsar site are provided in Chapter 22 of Part 4.

Further, the shoreline of Point Henry (the south-eastern boundary to Corio Bay) is also recognised to support significant environmental values. Seagrass communities occur along both the eastern and western shores of Point Henry (DELWP, 2017). The locality of Point Henry has been identified as an Important Bird Area by Birdlife Australia, supporting internationally significant numbers of migratory birds, in addition to nationally significant numbers of the critically endangered Curlew Sandpiper (Birdlife Australia, 2020).

Land use of Point Henry peninsula is guided by the Moolap Coastal Strategic Framework Plan, which protects areas for environmental, historical and cultural purposes, in addition to providing opportunities for new residential, industrial and tourism developments. It is noted the peninsula has previously been used as an aluminium smelter and rolling mill, which recently closed operations in 2014 (DELWP, 2019a).

Table 3‑1 identifies the Commonwealth listed threatened species which have been recorded in Corio Bay.

Table 3‑1: Threatened species recorded within the catchments downstream of the Growth Areas

| **Scientific name** | **Common name** | **EPBC listing** | **Presence within catchments** | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Hovells Creek** | **Cowies Creek** | **Barwon / Moorabool** | **Lake Connewarre** | **Corio Bay Estuary** |
| **THREATENED FLORA** | | | | | | | |
| *Glycine latrobeana* | Clover Glycine | Vulnerable |  |  | ✓ |  |  |
| *Lachnagrostis adamsonii* | Adamson’s Blown-grass | Endangered |  | ✓ |  |  |  |
| *Lepidium aschersonii* | Spiny Peppercress | Vulnerable |  |  | ✓ | ✓ |  |
| **THREATENED FAUNA** | | | | | | | |
| *Anthochaera phrygia* | Regent Honeyeater | Critically Endangered |  |  |  |  | ✓ |
| *Botaurus poiciloptilus* | Australasian Bittern | Endangered | ✓ |  | ✓ | ✓ | ✓ |
| *Calidris canutus* | Red Knot | Endangered, Migratory, FPAL | ✓ |  |  | ✓ | ✓ |
| *Calidris ferruginea* | Curlew Sandpiper | Critically Endangered, Migratory, FPAL |  |  |  | ✓ | ✓ |
| *Calidris tenuirostris* | Great Knot | Critically Endangered, Migratory, FPAL |  |  |  | ✓ | ✓ |
| *Callocephalon fimbriatum* | Gang-gang Cockatoo | Endangered | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Charadrius leschenaultii* | Greater Sand Plover | Vulnerable, Migratory |  |  |  |  | ✓ |
| *Charadrius mongolus* | Lesser Sand Plover | Endangered, Migratory |  |  |  |  | ✓ |
| *Dermochelys coriacea* | Leatherback Turtle | Endangered, Migratory |  |  |  |  | ✓ |
| *Diomedea exulans* | Wandering Albatross | Vulnerable, Migratory |  |  | ✓ | ✓ |  |
| *Halobaena caerulea* | Blue Petrel | Vulnerable |  |  |  | ✓ |  |
| *Hirundapus caudacutus* | White-throated Needletail | Vulnerable, Migratory | ✓ |  | ✓ | ✓ | ✓ |
| *Isoodon obesulus obesulus* | Southern Brown Bandicoot | Endangered |  |  | ✓ |  |  |
| *Lathamus discolor* | Swift Parrot | Critically Endangered | ✓ |  | ✓ | ✓ |  |
| *Lepidochelys olivacea* | Pacific (Olive) Ridley | Endangered |  |  |  |  | ✓ |
| *Limosa lapponica baueri* | Western Alaskan Bar-tailed Godwit | Vulnerable, FPAL |  |  |  | ✓ | ✓ |
| *Litoria raniformis* | Growling Grass Frog | Vulnerable |  | ✓ | ✓ | ✓ | ✓ |
| *Maccullochella peelii* | Murray Cod | Vulnerable |  |  | ✓ |  |  |
| *Macquaria australasica* | Macquarie Perch | Endangered |  |  | ✓ |  |  |
| *Macronectes giganteus* | Southern Giant-Petrel | Endangered, Migratory |  |  |  | ✓ | ✓ |
| *Macronectes halli* | Northern Giant Petrel | Vulnerable, Migratory |  |  |  | ✓ |  |
| *Mirounga leonina* | Southern Elephant Seal | Vulnerable |  |  |  |  | ✓ |
| *Nannoperca obscura* | Yarra Pygmy Perch | Vulnerable |  |  | ✓ | ✓ |  |
| *Neophema chrysogaster* | Orange-bellied Parrot | Critically Endangered | ✓ |  |  | ✓ | ✓ |
| *Neophema chrysostoma* | Blue-winged Parrot | Vulnerable | ✓ |  | ✓ | ✓ |  |
| *Numenius madagascariensis* | Eastern Curlew | Critically Endangered, Migratory, FPAL | ✓ |  |  | ✓ | ✓ |
| *Pachyptila turtur* | Fairy Prion (southern) | Vulnerable |  | ✓ |  | ✓ |  |
| *Pedionomus torquatus* | Plains-wanderer | Critically Endangered |  |  |  | ✓ | ✓ |
| *Prototroctes maraena* | Australian Grayling | Vulnerable |  |  | ✓ | ✓ |  |
| *Pteropus poliocephalus* | Grey-headed Flying-fox | Vulnerable |  |  | ✓ |  | ✓ |
| *Rostratula australis* | Australian Painted Snipe | Endangered |  |  | ✓ | ✓ |  |
| *Sternula nereis nereis* | Australian Fairy Tern | Vulnerable | ✓ |  |  | ✓ | ✓ |
| *Thalassarche carteri* | Indian Yellow-nosed Albatross | Vulnerable, Migratory |  |  |  | ✓ |  |
| *Thalassarche melanophris* | Black-browed Albatross | Vulnerable, Migratory |  |  |  | ✓ |  |
| *Thinornis cucullatus cucullatus* | Eastern Hooded Plover | Vulnerable |  |  |  | ✓ |  |

## Key threats

A key threat to biodiversity values within the Geelong locality is loss of habitat for development. The region surrounding Geelong has historically been heavily developed for agricultural production, resulting in substantial losses of native vegetation (DSE, 2003). The city of Geelong itself has also long been a centre of development in Victoria and has been the second largest city in Victoria since the 1930’s (Victorian Places, 2015). Historical development and clearing has resulted in loss of native vegetation and landscape degradation, reducing habitat availability and quality for native species.

Today, Geelong’s population is continuing to grow, with a predicted 2.5 per cent annual growth rate, and is anticipated to have an additional 500,000 residents by 2050 (The City of Greater Geelong, 2021b). Careful management is required to minimise impacts of development to support this forecast increase in population.

Other key environmental threats within the region include:

* Invasive species, including pests and weeds
* Modification of water systems, including historical construction of infrastructure such as dams and weirs, ongoing water abstraction, and water pollution from agricultural and urban sources
* Disturbance pressures upon habitats used recreationally, such as estuarine and beach environments
* Climate change

Each of these is discussed briefly below.

### Invasive species

As a result of extensive historical development, there is a high density of weeds within the Geelong locality. For instance, surveys conducted within the Growth Areas found a high density of weeds and introduced pasture species across most of the surveyed areas (EHP, 2021). Weeds also pose a threat within the wider Study Area, including within the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar site (DELWP, 2020).

Pest animals are also present within the region. Within the Growth Areas, there is evidence that sites are occupied by rabbits, hares and foxes (EHP, 2021). Additionally, foxes, cats, rabbits, deer are identified as invasive species of concern at the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar site (DELWP, 2020). Other invasive species, such as pigs, goats, are likely to also be present within the region. It is not considered possible to eradicate existing pests within the region and therefore asset protection approaches are considered the most effective management mechanism to minimise potential impacts to MNES (EHP, 2021).

### Water system modification

All of the major watercourses within the Geelong region have experienced environmental impacts from development.

In-stream dams or similar barriers are located where the Barwon River discharges into Lake Connewarre, and along the Barwon and Moorabool Rivers (upstream of Geelong) (Corangamite CMA, 2014). Dams pose a range of threats to riverine environments, including acting as barriers to fish passage, through altering characteristics of the water (such as water temperature and oxygen content), and through artificially altering water levels.

Water extraction from the Barwon and Moorabool rivers occurs to support consumptive and agricultural purposes. Current environmental water allocations for both of these rivers is not sufficient to meet environmental needs into the future (DELWP, 2021).

The environmental values of the Moorabool River, Barwon River, Hovells Creek, and Lake Connewarre Complex are all threatened by indirect impacts from agricultural and urban development within these catchments, including grazing pressures, invasive species, poor water quality, erosion and sedimentation, and degradation of native vegetation (Corangamite CMA, 2014).

### Recreational Disturbance

The Geelong locality is a popular destination for recreational purposes. Recreational activities in estuarine and coastal environments (including dog walking on beaches, driving vehicles off-road, and water-based activities such as jet skiing, kite surfing, kayaking) can pose a threat of disturbance, particularly to waterbirds and migratory birds which occur in coastal environments, and within and near the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar site. The consequence of disturbance impacts upon waterbirds and migratory birds (many of which are protected under the EPBC Act) can be significant, leading to nest abandonment, population declines, or potentially reduced migratory success. The impacts of disturbance are forecast to increase as the human population within the region increases (DELWP, 2020).

### Climate change

Climate change is rapidly emerging as one of the most significant threats to ecosystems and biodiversity (Prober *et al.*, 2019). Victoria’s climate is among the driest and most variable globally, and ecosystems in Victoria are particularly vulnerable to climate change (Jin, Cant and Todd, 2009). Various changes in Victoria’s climate have been recorded in recent decades: temperatures have increased by over 1.0°C since 1910, and fire season length and severity has increased. Future projections forecast that Victoria will continue to experience increased temperatures, in addition to less rainfall and more extreme weather events (DELWP, 2019b). Victoria’s Climate Change Strategy, released in 2021, outlines the Victorian Government’s approach to managing climate change, including emissions reductions targets and measures to build climate resilience (DELWP, 2021b).

More locally in the Geelong region, climate change poses specific threats through:

* Sea level rise, which particularly threaten coastal and estuarine habitats, including the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar site (DELWP, 2020)
* Increased storm intensity and frequency, which is likely to exacerbate the impacts of sea level rise (DELWP, 2020)
* Decreased water availability, which threatens water supply within the region and environmental values (Corangamite CMA, 2014; DELWP, 2021a)

# How to read this report

This chapter:

* Sets out the structure of the report
* Provides advice about how best to navigate the document in electronic form
* Describes how the report addresses regulatory requirements

## Structure of the report

Table 4‑1 outlines the structure and content of each of the main components (parts) of the SAR. Each part contains multiple chapters. Please refer to the ‘Contents of the NWGGA Strategic Assessment Report’ at the beginning of this document for the full SAR contents.

Table 4‑1: SAR part structure and descriptions

|  |  |
| --- | --- |
| **Report part** | **Content description** |
| **Part 1:**  **Overview** | Provides a general introduction to the project, the regulatory context, an overview of the landscape context, and outlines how to read the SAR. |
| **Part 2:**  **Description of the Plan** | Describes the Plan, including its development, conservation framework, and assurance and implementation framework. |
| **Part 3:**  **Assessment approach** | Provides details of the assessment approach, including:   * Methods for identifying relevant protected matters that need assessing in the SAR * Methods for mapping native vegetation, TECs and species habitat * Identification of impacts that may occur as a result of implementing the Plan * The Plan’s approach to addressing uncertainty and risk |
| **Part 4:**  **Impact assessment** | Covers the requirements of the ToR relating to identifying existing biodiversity values and assessing the impacts of the Plan on relevant protected matters. |
| **Part 5:**  **Evaluation of the outcomes of the Plan** | Evaluates how the Plan meets the principles of ecologically sustainable development and the adequacy of the Plan in relation to the ToR and endorsement criteria. |

## Advice about how best to navigate the document in electronic form

We recommend viewing the SAR using Adobe Acrobat Reader as per the following instructions:

* Download and install Adobe Acrobat Reader by following this link https://get.adobe.com/reader/
* Download the report and save to your computer
* Right click on the report and select ‘Open with Adobe Acrobat Reader’
* Click the bookmark symbol in the Adobe interface - the headings for each report Part will appear
* Click on the > symbol next to the Part headings - the headings for each report Chapter will appear
* Navigate through the report by clicking on the Part and Chapter headings

As outlined previously, the Assessment Report presents a range of maps which are provided as separate PDF files. These are accessed by clicking on the map links throughout the report and the maps will open in a separate tab in your internet browser.

## How this report addresses regulatory requirements

The requirements for preparing a SAR are set out under the ToR under the Part 10 Strategic Assessment Agreement.

Table 4‑2 sets out the ToR requirements for preparing the SAR and identifies where each of these requirements are addressed.

Table 4‑2:Where requirements for preparing a SAR are addressed in this Assessment Report

| **Section** | **ToR requirement** | **Chapter of Assessment Report** |
| --- | --- | --- |
| 1. Purpose of the strategic assessment report | 1.1. The Report must assess the impacts of actions under the Plan on all relevant protected matters. | Part 4 (Chapter 16) |
| 1.2. The Report must address how those impacts will be avoided, mitigated and offset (where necessary or appropriate) to ensure the long-term protection of protected matters. | Part 4 (Chapter 16, 17) |
| 1.3. The Report must provide sufficient detail to enable an evaluation of the ability of the Plan to ensure the long-term protection and conservation of the relevant protected matters. | Part 4 |
| 2. Description of the plan | 2.1. The Report must describe the Plan to which the Agreement relates:  a) The Report must provide a summary outlining the Plan’s overall purpose, key elements, spatial extent, and timeframes, including how long the Plan is proposed to be in effect  b) The Report must provide details about the key elements of the Plan, including:  i. the outcomes, commitments, and measures to be delivered for protected matters  ii. the class or classes of actions likely to be taken under the Plan over the term of the Plan  iii. the legal and administrative frameworks to implement and ensure compliance with the Plan, and the persons and authorities responsible for implementation and compliance  iv. the relationship of the Plan to other relevant Commonwealth and State policies, plans and guidelines, commitments, regulations and legislation, including environmental approvals, including impacts of the Plan on biodiversity and other state-protected environmental and heritage matters  v. an identification of actions or classes of actions that are outside the scope of the Plan  vi. management and funding arrangements for implementing the Plan and complying with any approval given with respect to the Plan under Part 10 of the EPBC Act, including but not limited to:   * a description of the mechanism that will be used by City of Greater Geelong to verify the persons who are proposing to take an action in accordance with the Plan, and to inform those persons of approval conditions   c) The Report must describe the need and justification for the Plan including the environmental, social and economic drivers for its development  d) The Report must describe the decision-making framework that was used in considering alternatives and developing conservation outcomes of the Plan. It should identify the alternative options that were evaluated to reach the final Plan, and why these options were not supported  e) The Report must 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 | Part 2  Part 5 (Chapter 28) |
| 3. Description of the protected matters impacted by the plan | 3.1. The Report must describe the nature of the environment within the strategic assessment area that may be impacted by actions proposed to be taken under the Plan. This must include (at a minimum):  a) a description and map of current and historical land-use, including consideration of areas which may pose an environmental risk  b) a description of indigenous land-use and values  c) the broad extent, type and quality of vegetation present in the strategic assessment area, where such information is available or is required in the relevant EPBC Act statutory document for a protected matter (such as a recovery plan)  d) a description of the nature of the terrestrial and aquatic environment, including the state of natural and physical resources, ecological processes, and threatening processes  e) a description of relevant state-protected environmental and heritage values  f) a description of the landscape context and key environmental matters, such as any known habitat connectivity, habitat fragmentation, and ecological processes  g) map or maps of areas that are already protected, including national parks, nature reserves, and known offset areas under both Commonwealth and/or State legislation  h) a description of the type of baseline data that will be used to inform future monitoring of biodiversity  i) the location of any declared World Heritage properties or National Heritage places in the strategic assessment area and identification of sensitive heritage areas for protected matters | Part 1 (Chapter 3)  Part 4 |
| 3.2. The Report must identify and describe each protected matter that may be impacted directly, indirectly and/or cumulatively by actions proposed to be taken under the Plan (these are the ‘relevant protected matters’), including (at a minimum):  a) maps of listed ecological communities and descriptive information including listing status, threatening processes, habitat quality and landscape context  b) maps of species records and habitat for listed threatened species including habitat quality and landscape context  c) descriptive information for listed threated species including listing status, threatening processes, estimates of population size or abundance and distribution within and adjacent to the strategic assessment area  d) extent and condition and ecological character of declared Ramsar wetlands. This must include information on past, present and projected trends in the ecological character and its likelihood to change over time  e) spatial and descriptive information for declared world Heritage properties and National Heritage places and their values, located within or adjoining to the strategic assessment area.  f) spatial and descriptive information on the environment of Commonwealth land within or adjoining the strategic assessment area  g) maps of species records and habitat for listed migratory species located within or adjoining the strategic assessment area, including estimates of habitat usage and species abundance in the context of global populations | Part 4 (Chapters 19 to 25) |
| 4. Assessment of the impacts of the plan on protected matters | 4.1. The Report must describe and assess the likely direct, indirect and cumulative impacts of actions taken under the Plan on all relevant protected matters. This must include, but not necessarily be limited to, an assessment of impacts of clearing, disturbance and fragmentation | Part 3 (Chapter 11)  Part 4 (Chapters 17 and 25) |
| 4.2. The Report must describe and provide justification for the method used to assess likely impacts on all protected matters arising from actions proposed to be taken under the Plan. The method must:  a) be appropriate for assessment at a strategic scale  b) rely on the best available information  c) discuss uncertainty, including reference to the data and information relied upon | Part 3 (Chapters 14 and 14) |
| 4.3. The Report may also consider protected matters that are potentially eligible for listing as a result of inclusion in a final priority assessment listing held by the Commonwealth, or a recommendation to the Minister for listing by the Threatened Species Scientific Committee prior to the Report being submitted | Part 4 (Chapter 24) |
| 4.4. The Report must include analysis of:  a) how impacts on protected matters will be avoided  b) the duration, extent and likely severity of the impacts  c) the mitigation measures that will be implemented and their likely effectiveness to reduce impacts on the protected matters. An evaluation of effectiveness must include whether the key mitigation measures for protecting MNES are feasible, achievable and economically viable  d) how unavoidable impacts will be offset in accordance with the principles of the Environment Protection and Biodiversity Conservation Act, Environmental Offsets Policy, 2012  e) the proposed funding arrangements and the timeframes for the delivery of mitigation and offset requirements | Part 4 (Chapter 16, 17  Part 5 (Chapter 29) |
| 4.5. The Report must include an analysis of the conservation benefits (beneficial impacts) of the Plan, including:  a) how protected matters will be conserved, protected and managed within the strategic assessment area  b) information regarding the process for establishing conservation areas. This must include information regarding land tenure, timing, funding and legal protective mechanisms.  c) 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  d) available evidence to support conclusions reached regarding the effectiveness of the outcomes, commitments and measures identified in the Plan | Part 2 (Chapter 8, 9)  Part 5 (Chapter 29) |
| 4.6. The Report must consider the extent to which the impacts on relevant protected matters of actions proposed under the Plan would be consistent with the EPBC Act, including but not limited to:  a) how approving a class of actions to be taken in accordance with the Plan would not be inconsistent with Australia’s international obligations, including under the Convention on Biological Diversity, World Heritage Convention, Ramsar Convention and the Convention for Migratory Species to the extent they apply to the relevant protected matters (section 146G, 146J, 146K and 146L of the EPBC Act)  b) how approving a class of actions to be taken in accordance with the Plan would not be inconsistent with recovery plans and threat abatement plans (section 146K(2) of the EPBC Act)  c) how regard has been and will be given to relevant information in conservation advices (section 146K(3) of the EPBC Act), threat abatement plans and recovery plans  d) how approving a class of actions to be taken in accordance with the Plan would not be inconsistent with management plans for National Heritage places (sections 324S and 324X of the EPBC Act), management plans for declared World Heritage properties (sections 146G of the EPBC Act), the Australian World Heritage management principles (section 146G of the EPBC Act) and the National Heritage management principles (section 146H of the EPBC Act) | Part 4 (Chapters 17, 22 and 23) |
| 4.7. The Report must include information regarding the process for establishing conservation areas. This must include information regarding land tenure, timing, funding and management | Part 2 |
| 4.8. The Report must include justification for key methods used in the assessment | Part 3 (Chapter 13) |
| 4.9. The Report must include or refer to data from ecological surveys | Part 3 (Chapter 13) |
| 5. Evaluation of the overall outcomes of the plan | 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 | Part 5 (Chapter 29) |
| 5.2. The evaluation must include:  a) the extent to which protected matters are represented in the strategic assessment area  b) the extent to which protected matters are represented in areas to be protected or managed under the Plan  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  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  e) the likely effectiveness of the outcomes, commitments and measures under the Plan in protecting and managing protected matters and any risks and uncertainties  f) an assessment of how the Plan meets the endorsement criteria, asset out in Attachment 2 of the Agreement | Part 5 (Chapter 29) |
| 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:  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 | Part 3 (Chapter 14)  Part 5 (Section 29.4 of Chapter 29) |
| 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) ensure outcomes, commitments and measures for protected matters contained in the Plan are, documented, delivered and adequately resourced throughout the life of the Plan  b) 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 the commitments and measures are not leading to the desired outcomes or where there are risks to protected matters  c) ensure new information relating to protected matters, including legislative changes, may be assessed and accounted for in implementation of the Plan  d) 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  e) ensure compliance with the Plan will be monitored and non-compliance will be reported  f) provide for a 5-yearly assurance review and report | Part 5 (Section 29.6 of Chapter 29) |
| 7.2. 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 | Part 5 (Section 29.6 of Chapter 29) |
| 8. Social and economic impacts | 8.1. The Report must assess the social and economic impacts of the Plan | Part 4 (Chapter 26) |
| 8.2. The Report must describe the consultation with the public (including affected parties) undertaken during the development of the Plan | Part 4 (Chapter 26) |
| 8.3. The Report must describe the process by which parties who may be affected by the strategic assessment will be accorded natural justice and procedural fairness as part of the assessment of impacts of the plan | Part 4 (Chapter 26) |
| 9. Information sources | 9.1. The Report must identify the sources of information and data relied upon including the reliability and currency of the data. | Part 3 (Chapter 13) |

References

Agriculture Victoria (2020) ‘Victorian Resources Online: Corangamite Climate’.

Barwon River Ministerial Advisory Committee (2020) ‘Our living rivers of the Barwon: A discussion paper for the future’.

Birdlife Australia (2020) ‘Australian National Directory of Important Migratory Shorebird Habitat’. Prepared for the Department of Agriculture, Water and the Environment by Birdlife Australia.

Corangamite CMA (2014) ‘Corangamite Waterway Strategy 2014 - 2022’.

Corangamite CMA (2016) ‘Moorabool River Environmental Water Management Plan’.

Corangamite CMA (2022a) ‘Corangamite Catchment Management Authority NRM Planning Portal’.

Corangamite CMA (2022b) ‘Corangamite Regional Catchment Strategy’.

Dahlhaus, P. *et al.* (2003) ‘Victorian Volcanic Plains Scoping Study’. CSIRO Land and Water.

Dahlhaus, P. *et al.* (2008) ‘Beyond hydrogeologic evidence: Challenging the current assumptions about salinity processes in the Corangamite region, Australia’, *Hydrogeology Journal*, 16(7), pp. 1283–1298. Available at: https://doi.org/10.1007/s10040-008-0313-2.

DELWP (2005) ‘Native Vegetation - Modelled 2005 Ecological Vegetation Classes (with Bioregional Conservation Status)’. Department of Environment, Land, Water and Planning.

DELWP (2017) ‘Port Phillip Bay Environmental Management Plan 2017–2027’. Department of Environment, Land, Water and Planning.

DELWP (2019a) ‘Moolap Coastal Strategic Framework Plan’. Department of Environment, Land, Water and Planning.

DELWP (2019b) ‘Victoria’s Climate Science Report 2019’.

DELWP (2020) ‘Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site Ecological Character Description’. Department of Environment, Land, Water and Planning.

DELWP (2021a) ‘Central and Gippsland Region Sustainable Water Strategy Discussion Draft’. Department of Environment, Land, Water and Planning.

DELWP (2021b) ‘Victoria’s Climate Change Strategy’. Department of Environment, Land, Water and Planning.

DELWP (2022) ‘Geomorphology of Victoria’. Dataset published by Department of Environment, Land, Water and Planning.

DSE (2003) ‘Biodiversity Action Planning: Strategic Overview for the Victorian Volcanic Plain Bioregion’. Victorian Government Department of Sustainability and Environment.

EHP (2021) ‘Existing Ecological Conditions: Northern and Western Geelong Growth Areas’. Prepared for the City of Greater Geelong.

Environment Australia (2000) ‘Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1 - Summary Report’.

GbLA Landscape Architects (2022) ‘Draft Cowies Creek Geelong Landscape MasterPlan’.

Geelong Region Alliance (2007) ‘The Geelong Region Plan’. G21 Geelong Region Alliance.

Heritage Council Victoria (2022) ‘Victorian Heritage Register’.

Jin, C., Cant, B. and Todd, C. (2009) *Climate change impacts on wetlands in Victoria and implications for research and policy*. Citeseer.

Monument Australia (2010) ‘Centenary of Geelong’.

Prober, S.M. *et al.* (2019) ‘Recent climate-driven ecological change across a continent as perceived through local ecological knowledge’, *PLOS ONE*. Edited by J. Hewitt, 14(11), p. e0224625. Available at: https://doi.org/10.1371/journal.pone.0224625.

Rowe, D. (2021) ‘About Corayo: A Thematic History of Greater Geelong’. The City of Greater Geelong.

The City of Greater Geelong (2016) ‘catchments-city-of-greater-geelong’. https://www.geelongdataexchange.com.au/explore/dataset/catchments-city-of-greater-geelong/information/.

The City of Greater Geelong (2021a) ‘Climate change response plan 2021-2030’.

The City of Greater Geelong (2021b) ‘The Northern and Western Geelong Growth Areas Framework Plan.’

The City of Greater Geelong (2022) ‘Draft Northern and Western Geelong Growth Areas EPBC Plan’.

Victoria State Government (2017) ‘Plan Melbourne 2017-2050’.

Victorian Places (2015) ‘Geelong’. Monash University, University of Queensland.

Walker, S.J. (1999) ‘Coupled hydrodynamic and transport models of Port Phillip Bay, a semi-enclosed bay in south-eastern Australia’, *Marine and Freshwater Research*, 50(6), pp. 469–481. Available at: https://doi.org/10.1071/MF98071.

Williams, N. (2022) ‘Southern Volcanic Plain’. University of Melbourne, Ecolinc.



MAY 2023

DRAFT NWGGA STRATEGIC ASSESSMENT REPORT

PUBLIC EXHIBITION VERSION

PART 2: DESCRIPTION OF THE PLAN

PREPARED FOR THE CITY OF GREATER GEELONG

DOCUMENT TRACKING

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| **VERSION CONTROL:** | |
| VERSION: | Public exhibition version |
| DATE: | May 2023 |

Contents

[List of Tables iii](#_Toc134688535)

[PART 2: DESCRIPTION OF THE PLAN 5-1](#_Toc134688536)

[5 Introduction 5-1](#_Toc134688537)

[5.1 Purpose and content of the Plan 5-2](#_Toc134688538)

[5.2 The supporting documents 5-2](#_Toc134688539)

[5.3 Objective and outcomes of the Plan 5-4](#_Toc134688540)

[6 Need for the Plan and consideration of alternatives 6-1](#_Toc134688541)

[6.1 Introduction 6-1](#_Toc134688542)

[6.2 Key planning challenges and trends 6-1](#_Toc134688543)

[6.3 Planning and policy context 6-2](#_Toc134688544)

[6.4 Need and justification for the Plan 6-9](#_Toc134688545)

[6.5 Consideration of alternatives 6-10](#_Toc134688546)

[7 Development under the Plan 7-1](#_Toc134688547)

[7.1 Introduction 7-1](#_Toc134688548)

[7.2 Location of development 7-1](#_Toc134688549)

[7.3 Development classes of actions 7-2](#_Toc134688550)

[7.4 Persons who can undertake development and their obligations 7-5](#_Toc134688551)

[8 Conservation framework 8-1](#_Toc134688552)

[8.1 Introduction 8-1](#_Toc134688553)

[8.2 Overview of the conservation framework 8-1](#_Toc134688554)

[8.3 Avoidance and minimisation of impacts 8-1](#_Toc134688555)

[8.4 Mitigation of impacts 8-2](#_Toc134688556)

[8.5 Residual impacts and offsets 8-3](#_Toc134688557)

[8.6 Delivery of external infrastructure 8-5](#_Toc134688558)

[9 Assurance and implementation framework 9-1](#_Toc134688559)

[9.1 Introduction 9-1](#_Toc134688560)

[9.2 Governance framework 9-1](#_Toc134688561)

[9.3 Funding framework 9-1](#_Toc134688562)

[9.4 MERI framework 9-2](#_Toc134688563)

[9.5 Compliance framework 9-3](#_Toc134688564)

[References A](#_Toc134688565)

List of Tables

[Table 5‑1: Definition of the components of the outcomes framework 5-5](#_Toc134688566)

[Table 5‑2: Outcomes of the Plan 5-5](#_Toc134688567)

[Table 6‑1: Overview of planning policy documents and their relevance to the Growth Areas 6-4](#_Toc134688568)

[Table 7‑1: Commitments for development 7-1](#_Toc134688569)

[Table 8‑1: Commitments for avoidance 8-2](#_Toc134688570)

[Table 8‑2: Commitments for mitigation 8-3](#_Toc134688571)

[Table 8‑3: Commitments for offsetting 8-4](#_Toc134688572)

[Table 8‑4: Commitments for external infrastructure development 8-5](#_Toc134688573)

[Table 9‑1: Commitments for governance 9-1](#_Toc134688574)

[Table 9‑2: Commitment for funding 9-2](#_Toc134688575)

[Table 9‑3: Commitments for MERI 9-3](#_Toc134688576)

[Table 9‑4: Commitment for compliance 9-3](#_Toc134688577)

PART 2: DESCRIPTION OF THE PLAN

# Introduction

This part (Part 2) of the assessment report provides a description of the Plan and is structured to address the following:

* The overall purpose, content and structure of the Plan and associated documents (Chapter 5)
* The need and justification for the Plan and how it was developed, including consideration of alternatives (Chapter 6)
* Development that is supported by the Plan including the classes of actions (Chapter 7)
* An overview of the conservation that will be delivered by the Plan (Chapter 8)
* An overview of the assurance and implementation processes for the Plan (Chapter 9)

The sections of the ToR that are relevant to Part 2 are outlined in the following text box:

|  |
| --- |
| *2.1. The Report must describe the Plan to which the Agreement relates:*  *a) The Report must provide a summary outlining the Plan’s overall purpose, key elements, spatial extent, and timeframes, including how long the Plan is proposed to be in effect.*  *b) The Report must provide details about the key elements of the Plan, including:*  *i. the outcomes, commitments, and measures to be delivered for protected matters.*  *ii. the class or classes of actions likely to be taken under the Plan over the term of the Plan.*  *iii. the legal and administrative frameworks to implement and ensure compliance with the Plan, and the persons and authorities responsible for implementation and compliance*  *iv. the relationship of the Plan to other relevant Commonwealth and State policies, plans and guidelines, commitments, regulations and legislation, including environmental approvals*  *v. an identification of actions or classes of actions that are outside the scope of the Plan*  *vi. management and funding arrangements for implementing the Plan and complying with any approval given with respect to the Plan under Part 10 of the EPBC Act, including but not limited to:*   * *a description of the mechanism that will be used by City of Greater Geelong to verify the persons who are proposing to take an action in accordance with the Plan, and to inform those persons of approval conditions*   *c) The Report must describe the need and justification for the Plan including the environmental, social and economic drivers for its development.*  *d) The Report must describe the decision-making framework that was used in considering alternatives and developing conservation outcomes of the Plan. It should identify the alternative options that were evaluated to reach the final Plan, and why these options were not supported.*  4*.5. The Report must include an analysis of the conservation benefits (beneficial impacts) of the Plan, including:*  *a) how protected matters will be conserved, protected and managed within the strategic assessment area*  *b) information regarding the process for establishing conservation areas. This must include information regarding land tenure, timing, funding and legal protective mechanisms.*  *4.7. The Report must include information regarding the process for establishing conservation areas. This must include information regarding land tenure, timing, funding and management* |

The following chapter provides an overall description of the Plan including:

* Purpose and content of the Plan
* Implementation documents which support the Plan
* Objective and outcomes of the Plan

## Purpose and content of the Plan

The purpose of the Plan is to ensure development within the Growth Areas and associated infrastructure development outside the Growth Areas protects MNES and proceeds in accordance with the requirements of the EPBC Act.

The Plan does not address Victorian planning, biodiversity or other regulatory requirements. Separate approvals are needed in accordance with State regulatory requirements before the development under the Plan can proceed.

The Plan:

* Describes the development (classes of actions) for which approval is being sought under the EPBC Act
* Sets out an objective, and a series of outcomes and commitments to define what the Plan will achieve
* Sets out a conservation framework to address the impacts of the development on MNES, including through avoiding and minimising, mitigating, and offsetting residual impacts
* Describes the process for delivering infrastructure outside the Growth Areas
* Sets out an assurance and implementation framework to implement the Plan

The Plan recognises the importance of the biodiversity values within the Greater Geelong area for MNES and will facilitate Geelong’s future growth by streamlining EPBC Act approvals and ensuring implementation is cost efficient in its support of both urban growth and the protection of MNES.

The commitments in the Plan represent agreed pledges by the approval holder (The City of Greater Geelong) for undertaking actions to address impacts to MNES. The commitments will not be changed once the Plan is endorsed under Part 10 of the EPBC Act, and the approval holder will be responsible for the delivery of these commitments over the life of the Plan.

### Plan timing

Implementation of the Plan will commence at the point that the Plan is endorsed and one or more of the classes of action has been approved. Implementation will occur for a period of 30 years. This timing is consistent with the implementation of the development under the *Northern and Western Geelong Growth Areas Framework Plan* (The City of Greater Geelong, 2021b)to 2047 and allows additional time to complete the implementation of the commitments under this Plan.

### Key elements of the Plan

The Plan includes the following key elements:

* Development – details the types of development (the classes of actions) that endorsement and approval under Part 10 of the EPBC Act will cover, including the scope and location of the development
* Conservation framework – describes conservation under the Plan, including the commitments that the Plan will deliver to avoid and minimise, mitigate and offset the impacts of the development on MNES
* Delivery of external infrastructure – describes how external infrastructure development located outside the Growth Areas within the Strategic Assessment Area will be delivered to avoid and minimise, mitigate and offset impacts on MNES
* Assurance and implementation framework – describes how the Plan will be implemented and what assurance mechanisms will be put in place to ensure the Plan’s outcomes are achieved

The key elements are described respectively in detail in Chapters 4, 5, 6 and 7 of the Plan.

## The supporting documents

The Plan is supported by four documents. These include:

* Three implementation documents:
  + 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
* A Strategic Assessment Report (SAR) (this document)

Figure 5‑1 shows the relationship between the documents associated with the strategic assessment.

The three implementation documents do not form part of the Plan to be endorsed by the Minister under Part 10 of the EPBC Act. While the commitments will not be changed once the Plan is endorsed under Part 10, the measures set out in the implementation documents may be updated from time to time as part of adaptive management (see Section 7.5 of the Plan).

### Commitments and Measures document

The Plan identifies a broad objective and national level outcomes relating to the protection of MNES under the EPBC Act and socio/economic considerations. The Plan’s outcomes represent standards of environmental protection that will be achieved for MNES under the Plan in accordance with the requirements of the EPBC Act. The Plan’s objective and outcomes will be achieved through the delivery of a set of commitments and measures. The outcomes, commitments and measures were developed through an ‘outcomes framework’ based on program logic principles (see Section 5.3).

The outcomes and commitments are set out in the Plan and will not be changed once the Plan is endorsed under Part 10 of the EPBC Act. However, 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 (see Section 7.5 of the Plan). 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 focussing on state and local biodiversity, and subsequent state level outcomes, commitments and measures. 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.

### Biodiversity Conservation Strategy

The BCS satisfies the delivery of three key actions (Action N1.3.1, N1.3.2 and W1.3.1) under the Framework Plan for the protection of biodiversity in the Growth Areas. The Framework Plan says an “overarching biodiversity conservation strategy will be prepared for the growth area[s] that provides high level guidance for the management of nationally and state significant biodiversity values…The strategy will spatially identify how outcomes for matters of national environmental significance will be delivered…” (The City of Greater Geelong, 2021b).

The purpose of the BCS is to:

* Identify the national, state and local biodiversity values that are present in the Growth Areas and set out a conservation program for providing genuine, long-term positive results for those values
* Set out how the conservation elements of the EPBC Plan for the Growth Areas will be implemented including through avoiding and minimising, mitigating, and offsetting residual impacts in accordance with the mitigation hierarchy (DSEWPC, 2012; DELWP, 2017b)
* Guide the preparation of Precinct Structure Plans and subsequent development within the Growth Areas will address and implement requirements under Victorian biodiversity regulations 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 Section 7.4 of the Plan. The detailed 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 will set 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 NGGA Conservation Area and Cowies Creek Conservation Area
* Implementing conservation measures
* Implementing the MERI framework and compliance framework

### Strategic Assessment Report

The Strategic Assessment Report (SAR) (this document) has been prepared to assess the impacts of the development under the Plan on MNES. The SAR also evaluates the adequacy of the Plan’s outcomes, commitments, and measures in protecting MNES over the life of the Plan.

The SAR has been prepared in accordance with the Commonwealth Terms of Reference (ToR) for the strategic assessment provided under the Strategic Assessment Agreement.



Figure 5‑1: Strategic assessment documents

## Objective and outcomes of the Plan

The Plan identifies a broad objective, as well as six outcomes relating to the protection of MNES under the EPBC Act and socio/economic considerations. The Plan’s outcomes represent standards of environmental protection that will be achieved for MNES under the Plan in accordance with the requirements of the EPBC Act. The Plan’s objective and outcomes will be achieved through the delivery of a set of commitments and measures.

The outcomes, commitments and measures were developed through an ‘outcomes framework’ based on program logic principles. The outcomes framework provides a way to structure what the Plan will deliver for the conservation of protected matters in a clear and logical way. It supports accountability and transparency by providing the basis and set of benchmarks for monitoring, reporting, and ongoing evaluation and adaptive management of the Plan.

The outcomes framework is a requirement of the Endorsement Criteria in the Strategic Assessment Agreement.

### Outcomes framework

The outcomes framework is comprised of four components:

* A broad ***objective***
* ***Outcomes***
* ***Commitments*** to deliver the outcomes
* ***Measures*** to implement the commitments

The definition of each of these is provided in Table 5‑1.

Table 5‑1: Definition of the components of the outcomes framework

| **Framework component** | **Definition** |
| --- | --- |
| Objective | The contribution that the outcomes of the Plan will make to broader State-wide, regional and local planning policies. It 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 achievement of the outcomes |
| Measures | The specific actions that will be undertaken to meet the commitments |

### Objective of the Plan

|  |
| --- |
| **The objective of the Plan is to:**  ***Provide for the protection of matters of national environmental significance while supporting the delivery of the Northern and Western Geelong Growth Areas Framework Plan and its objectives*** |

### Outcomes of the Plan

The outcomes of the Plan are set out in Table 5‑2. Refer to the Commitments and Measures document for an explanation and justification for each outcome.

The outcomes are fixed for the life of the Plan for the purposes of the EPBC Act once the Plan is endorsed. The measures to implement the commitments are set out in the implementation documents for the Plan and are not set out in the Plan (see Table 5‑2)

While the commitments in this Plan will not be changed once the Plan is endorsed, the measures set out in the implementation 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 (see Section 7.5 of the Plan).

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.

The approval holder is responsible for tracking progress against the achievement of outcomes under the Plan’s MERI framework and adjusting measures as necessary through adaptative management to ensure the outcomes will be achieved.

Table 5‑2: Outcomes of the Plan

| **No.** | **Outcome** |
| --- | --- |
| 1 | Populations of Golden Sun Moth and Striped Legless Lizard are maintained within the NGGA Conservation Area |
| 2 | 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 within the WGGA |
| 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 |
| 4 | Matters of national environmental significance associated with waterways, riparian areas and wetlands are protected from any adverse impacts of development under the Plan |
| 5 | The Plan improves regulatory efficiency by streamlining EPBC Act approvals |
| 6 | Implementation of the Plan is effective, timely, and cost efficient |

### Commitments

The commitments of the Plan are set out under the development, conservation and assurance and implementation chapters in the Plan.

The commitments are fixed for the life of the Plan for the purposes of the EPBC Act once the Plan is endorsed.

The Plan’s commitments cover:

* Incorporating the Plan into the planning system hierarchy so that development occurs in accordance with the Plan
* A series of conservation commitments relating to:
  + Avoiding and minimising impacts
  + Mitigating impacts
  + Offsetting residual impacts
* A series of assurance and implementation commitments, relating to:
  + Governance
  + Funding
  + MERI
  + Compliance

Commitments ae referenced throughout the SAR where relevant. A full list of commitments is provided in the Commitments and Measures document

### Measures

Each commitment has a set of measures associated with it. The implementation of those measures is expected to deliver the commitments.

The measures set out:

* What will be done to deliver the commitment
* Responsibilities for implementation
* Any relevant key support partners for implementation
* Timing of implementation
* Where appropriate:
  + The relevant standards or methods that will be applied
  + Any conditions relating where, when and under what circumstance actions will be carried out

Measures may be adjusted as necessary through adaptative management to ensure the outcomes and commitments are delivered (see Section 9.4).

The full list of the Plan’s measures is provided in the Commitments and Measures document.

# Need for the Plan and consideration of alternatives

## Introduction

The Plan has been prepared as part of a broader and complex long-term planning process for the Geelong region that aims to address a range of key planning challenges including population growth and housing availability.

This Chapter sets out:

* Key planning challenges and trends for Geelong
* Planning and policy context
* Need and justification for the Plan
* Considerations of alternatives in development of the Plan

## Key planning challenges and trends

Geelong is subject to several key planning challenges, including those relating to:

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

### Population growth

Geelong is considered to be the primary population centre outside of Melbourne and is the largest regional city in Victoria, with a current population of approximately 317,857 people (Victoria State Government, 2017; ABS, 2020).

Population growth in Geelong has been strong in recent years with population growing at a rate higher than Victoria and Greater Melbourne, averaging 1.7% per annum between 2007-2016 and reaching 2.7% in 2015-2016 (The City of Greater Geelong, 2021b).

Geelong’s population growth slowed in 2020-21 in line with the rest of Australia as a result of the COVID-19 pandemic and Victoria’s population declined for the first time in recent history (Parliament of Australia, 2021). However, from 2023-24 onwards, Melbourne is expected to be the fastest growing capital city in Australia and is likely to overtake Sydney’s population in 2029-30 (Parliament of Australia, 2021).

Greater Geelong is the largest and closest regional city to Melbourne and is likely to grow in line with Melbourne, especially as urbanisation continues to spread from Greater Melbourne (The City of Greater Geelong, 2021b). The following key factors are considered to contribute to increasing population growth in Geelong (The City of Greater Geelong, 2021b):

* Increasing land and housing demand in Melbourne
* Increased traffic congestion and other perceived stress associated with ‘big city’ living in Melbourne
* Urban growth in Melbourne is shifting to the inner areas and the west (closer to Geelong)
* Geelong offers a high level of amenity and accessibility, with cheaper land and house prices and reduced congestion compared to Melbourne
* Geelong residents have easy access to the metropolitan job market, lifestyle and facilities
* Increasing online and flexible work arrangements may increase Geelong’s viability for perspective residents
* Geelong is likely to continue to benefit from the demand for holiday and retirement housing

Based on recent analysis, the City is projected to exceed a population of 500,000 by 2050 with an anticipated, average annual growth rate of 2.5% (The City of Greater Geelong, 2021b).

### Housing

Population growth is the main driver for increased urban growth and housing demand. In order to accommodate Geelong’s future population, large areas of urban development are required (The City of Greater Geelong, 2021a).

Recently (partly the result of the COVID-19 pandemic), housing availability has not adequately kept pace with demand, which has led to high house and land prices (Ratio, 2022). This trend has been seen across most of Australia and supply of affordable housing is needed (Informed Decisions, 2022; Ratio, 2022).

Increasing the availability and variety of housing options will help to relieve the pressure on the current housing market. Providing diverse housing is also important for the success of new urban areas, as it attracts a range of potential residents at all stages of their life (The City of Greater Geelong, 2021a).

Without adequate planning for Geelong’s future growth, there could be a range of negative consequences for Geelong including (The City of Greater Geelong, 2021a):

* Land and housing shortages
* Increasingly poor housing affordability
* Restricted housing options
* Slowed and reduced economic and social growth

The City has already identified existing and future residential areas (including the Growth Areas) which have the capacity to accommodate approximately 25 years of population growth. However, this may vary depending on the actual growth rate experienced over the coming decades (The City of Greater Geelong, 2021a).

### Natural environment and amenity

The natural environment and built heritage of Geelong provides important social, cultural, aesthetic, economic, historic, and environmental values to the region. The environment of Geelong is under increasing pressure from historical and proposed new land uses (see Chapter 3 in Part 1) and balancing the protection of the environment and heritage with other urban development objectives is a significant planning challenge.

## Planning and policy context

In order to address Geelong’s planning challenges, a range of planning documents have been developed. An overview of the key planning and policy context for the identification and development Growth Areas is provided in this section.

The Victorian planning system is also the key delivery framework for implementing the Plan. The implementation of the Plan through Victorian regulatory frameworks is detailed in Section 2.3 of the Plan.

### Planning policy framework

The Planning Policy Framework (PPF) is the policy content of planning schemes and provides overarching policy to guide land use, subdivision and development in Victoria. The PPF is informed by Victorian Government policy.

The PPF includes planning policies under three tiers:

* State-wide – policies of state significant that apply in all planning schemes in Victoria
* Regional – policies of state significant that apply to allied planning schemes based on geographic groupings
* Local – policies of location significant that apply to an individual local planning scheme

Clause 71.02 requires responsible authorities to take into account and give effect to all planning policies in the PPF in approving development and making other planning decisions under the Geelong Planning Scheme.

The State PPF provides key directions for settlement, housing, environment, infrastructure and transport. A key requirement of the State PPF is that all councils maintain at least a fifteen-year supply of land for residential development.

Relevant State PPF considerations for the Growth Areas to address Geelong’s planning challenges include (The City of Greater Geelong, 2021b):

* Ensuring a sufficient supply of land is available for residential, commercial, retail, industrial, recreational, institutional and other community uses
* Locating urban growth close to transport corridors and services and provide efficient and effective infrastructure to create sustainability benefits
* Managing the sequence of development in areas of growth so that services are available from early in the life of new communities
* Protecting, restoring and enhancing sites and features of nature conservation, biodiversity, geological or landscape value
* Protecting and restoring catchments, water bodies, groundwater and water quality
* Providing housing choice and delivering more affordable housing closer to jobs, transport and services
* Supporting the establishment and maintenance of communities by delivering functional, accessible, safe and diverse physical and social environments through the appropriate location of use and development and through high quality buildings and urban design
* Establishing and maintaining a diverse and integrated network of public open space that meets the needs of the community
* Providing fair distribution and access to social and cultural infrastructure and health and education services
* Encouraging the concentration of major retail, residential, commercial, administrative, entertainment and cultural developments into activity centres that are highly accessible to the community
* Delivering an average overall residential density in growth areas to a minimum of 15 dwellings per hectare
* Supporting a diversified economy that builds on the region’s competitive strengths
* Creating a safe and sustainable transport system by integrating land use and transport
* Sustainably managing water supply, water resources, wastewater, drainage and stormwater through an integrated water management approach
* Promoting the provision of renewable energy
* Providing social and physical infrastructure to be provided in a way that is efficient, equitable, accessible and timely.

Table 6‑1 provides details of the key planning documents that are relevant to identification and development of the Growth Areas.

Table 6‑1: Overview of planning policy documents and their relevance to the Growth Areas

| **Planning document** | **Purpose and objectives for addressing planning challenges** | **Relevance to the Growth Areas** |
| --- | --- | --- |
| *Housing Diversity Strategy* (The City of Greater Geelong, 2008) | The aims of the strategy are to:   * Provide for the development of a range of housing types and densities and encourage urban consolidation within existing urban areas * Provide certainty to the existing and future community with regard to where different housing types would be supported or discouraged * Provide for a sustainable overall urban structure for Geelong   Under these broad aims, a principal role of the strategy is to help address three key influences on housing in Geelong:   * The environmental, social and economic need to manage urban sprawl and improve accessibility to urban services through consolidating urban development around places of activity and public transport infrastructure * The need to accommodate contemporary changes in housing needs, particularly the growing demand for medium and higher density housing that is close to urban services and lifestyle destinations * The need to manage the impact of urban consolidation and changing housing needs on the City’s existing neighbourhood character, particularly the character of established suburban areas | The Growth Areas had not yet been identified when the document was developed. However, the Growth Areas help to address the aims of the strategy through the development of the *Greater Geelong Settlement Strategy 2020* (see below) which incorporated the aims of the *Housing Diversity Strategy.* |
| *G21 Regional Growth Plan* (Geelong Region Alliance, 2013) | The G21 Region Plan was developed to establish a strategic framework for the environment, settlement, land use, community cohesion and the economy in the G21 region (includes Greater Geelong, Surf Coast Shire, Golden Plains Shire, Colac Otway Shire and Borough of Queenscliffe).  The plan identifies how challenges for future growth may be addressed, including the delivery of priority projects to enable future productivity, liveability and sustainability. | The plan first identified the Growth Areas as ‘Further Investigation Areas’ for urban growth.  The research undertaken to inform the G21 region plan included a projection of future population growth within the G21 region of 500,000 people by 2050. |
| *Plan Melbourne 2017 – 2050* (Victoria State Government, 2017) | Plan Melbourne guides the growth of Melbourne over 35 years. It sets the strategy for supporting jobs, housing and transport, while building on Melbourne's legacy of distinctiveness, liveability and sustainability.  The document sets out the Victorian Government’s policy to take pressure off Melbourne by channelling growth into regional Victoria. It also seeks to integrate long-term land use, infrastructure and transport planning, and support jobs and growth. | Investing in development of regional Victoria (which includes Geelong) is one of the Plan’s seven outcomes:  *“Continuing to invest in regional Victoria is important to support housing and economic growth, enhance social and economic participation and grow strong, healthy communities.”*  The plan also states that development in regional Victoria:   * Should keep with the character and amenity of individual towns * Balance the protection of productive land, economic resources and biodiversity values that are critical to the Victoria’s economic and environmental sustainability |
| *Council Plan 2018–22: Putting Our Community First* (The City of Greater Geelong, 2018) | Outlines the City’s priorities to make Greater Geelong a clever and creative city-region. It aims to guide the City’s resources to deliver infrastructure, services and programs to the community in a sustainable way  The Plan helps deliver local PPF policies are used to implement the objectives and strategies of the Municipal Strategic Statement.  Includes 11 strategic priorities:   * Improved health and safety of our community * Informed social infrastructure and planning * A more inclusive and diverse community * Planned sustainable development * Effective environmental management * Vibrant arts and culture * Integrated transport connections * A thriving and sustainable economy * Growing our tourism and events * Innovative finances and technology * Organisational leadership, strategy and governance | The plan informed the Northern and Western Geelong Growth Areas Framework Plan (see below), and the strategic priorities will also shape the subsequent precinct structure planning process for the Growth Areas.  Relevant local PPF considerations for the Growth Areas identified in the document include:   * Clause 21.06 Settlement and Housing that prioritises the investigation of future residential and industrial land use needs for Geelong, as a basis for future growth area planning, including:   + Assessment of the environmental, resource, landscape, development pattern, access, servicing, land use, economic and social constraints and opportunities associated with possible growth areas around Geelong   + Identification of a preferred growth area or areas   + Preparation of detailed growth area plans * Clause 21.08 Development and Community Infrastructure that provides direction around development contributions to ensure that infrastructure, open space and transport infrastructure is delivered in an efficient and timely manner in line with population growth. |
| *Greater Geelong Settlement Strategy 2020* (The City of Greater Geelong, 2021a) | The purpose of the strategy is to:   * Analyse future housing needs and trends * Develop a clear policy framework that will guide planning and decision-making and * Help meet Greater Geelong’s future housing needs   The strategy is intended to address municipal housing needs until 2036 which addresses the State Planning Policy Framework that all Victorian councils must plan to accommodate projected population growth over a 15-year period.  The strategy makes a number of recommendations to maintain Geelong’s housing advantages:   * Preserve significant landscapes and environments from urban encroachment * Contain urban development within settlement boundaries * Encourage urban consolidation, to increase the contribution it makes to the overall housing supply * Manage future growth to deliver more sustainable, well-serviced communities | Under the strategy, the City aims to direct the majority of Geelong’s future housing needs to urban areas including the Northern and Western Geelong Growth Areas:   * Includes a target of 50 per cent of housing growth occurring in established areas and 50 per cent accommodated in three major growth areas – Armstrong Creek, Northern Growth Area and the Western Growth Area * Identifies that the land within the Growth Areas has the capacity to accommodate 110,000 residents (16,000 dwellings in the NGGA and 18,000 dwellings in the WGGA) * States that the Growth Areas should comprise of a mix of housing types and densities to be consistent with state and local policy.   Managing future growth in the Northern and Western Geelong Growth Areas is a key focus of the Settlement Strategy as reflected in its principles and directions:   * Provide clear strategic direction on the spatial distribution of residential growth in Greater Geelong * Ensure housing diversity is achieved in existing and growth area communities * Increase the level of affordable and social housing in Greater Geelong. * Ensure growth areas are well planned and deliver sustainable communities * Manage the release of new growth areas to make sure infrastructure, services and facilities are provided in a timely and efficient way |
| *Greater Geelong: A Clever and Creative Future* (The City of Greater Geelong, 2022) | This document presents a 30-year vision for Geelong and was prepared in consultation with over 16,000 Geelong residents.  The community’s vision is:  *“By 2047, Greater Geelong will be internationally recognised as a clever and creative city- region that is forward looking, enterprising and adaptive, and cares for its people and environment.”*  The document seeks to include the following community values into future development of Geelong:   * Green spaces and corridors, including farmland and recreational space, between urban areas * Easy access to open space and parkland near homes Geelong clever and * The uniqueness and significance of natural bushland, coastlines, wetlands, rivers and beaches * Sustainable development that responds to climate change * Design that makes best use of technology for better and more sustainable living * Development that enhances the identity of diverse neighbourhoods * Design excellence and innovation in new buildings and public spaces * Creating high amenity neighbourhoods that are well connected and sustainable. | Functions as a key resource for designing and establishing the new communities in the Growth Areas and includes nine community led aspirations which will be implemented throughout the development of the Growth Areas:   * A prosperous economy that supports jobs and education opportunities * A leader in developing and adopting technology * Creativity drives culture * A fast, reliable and connected transport network * People feel safe wherever they are * An inclusive, diverse, healthy and socially connected community * Sustainable development that supports population growth and protects the natural environment * Development and implementation of sustainable solutions * A destination that attracts local and international visitors |
| *Northern and Western Geelong Growth Areas Framework Plan* (The City of Greater Geelong, 2021b) | The Framework Plan was prepared to outline development of the Growth Areas as part of the City’s plan to address the long-term growth in Geelong. The overarching Framework Plan vision is:  *“By 2047, Greater Geelong will be internationally recognised as a clever and creative city-region that is forward looking, enterprising and adaptive, and cares for its people and environment.”*  The Northern and Western Geelong Growth Areas Framework Plan is the largest greenfield planning project in regional Victoria with the capacity to accommodate 110,000 new Geelong residents.  The Framework Plan’s objectives are:   * Create diverse and vibrant new urban communities * Integrate transport and land use planning * Plan for local employment * Create growth areas with high amenity and character * Protect biodiversity, waterways and cultural heritage values * Create integrated open space networks * Plan for environmental sustainability * Stage development to ensure the efficient and orderly provision of infrastructure and services   The Framework Plan is incorporated into the Geelong Planning Scheme at Clause 11.02. | The Framework Plan is a high-level strategic document that:   * Outlines considerations for future development in the Growth Areas * Describes the existing social, economic and environmental context of the Growth Areas * Summarises pre-existing technical investigations * Provides an overarching vision for the Growth Areas and subsequent objectives and actions to achieve the vision * Outlines concept plans for future land uses within the Growth Areas   A key function of the Framework Plan is to guide the future preparation of detailed Precinct Structure Plans (PSPs) for the Growth Areas, which will set-out the specific land uses within each urban precinct |

## Need and justification for the Plan

The Plan is needed for the following key reasons. It:

* Supports the delivery of the Growth Areas
* Supports the delivery of key planning documents and subsequently addresses key planning challenges for Geelong
* Provides a mechanism to address conservation challenges for the Victorian Volcanic Plain bioregion in a strategic way

### Supports the delivery of the Growth Areas

The Plan supports delivery of the Northern and Western Geelong Growth Areas (the Growth Areas).

The Growth Areas provide strategic prioritisation of land for urban growth as part of Geelong’s need to address long-term population growth and meet social, economic and environmental outcomes for Geelong and the wider region. The Growth Areas provide two new areas for urban growth that are the key focus of urban development over the coming decades and will be the centres of economic and social activity in Geelong.

A range of social, economic and environmental benefits will be provided to Geelong and the wider region through delivery of the Growth Areas. Chapter 8 below describes conservation that will be delivered through development of the Growth Areas and Chapter 26.3 of the SAR provides a detailed analysis of the socio-economic impacts of the Plan.

### Supports the delivery of key planning documents

The Plan supports the delivery of key planning policies and documents for Geelong and Victoria. By supporting the delivery of these, the Plan is directly helping to address the key environmental, social, and economic planning challenges facing Geelong outlined in Section 6.2.

The key planning policies and documents that the Plan is supporting are listed in Section 6.3 and described in Section 2.3 of the Plan.

### Provides a mechanism to address conservation challenges

Conservation planning in the Victorian Volcanic Plain is subject to a number of challenges. Historically, biodiversity values in the region have been subject to significant loss and degradation due to agricultural practices and more recently as the result of urban growth (DSE, 2003; EHP, 2021). Many ecological communities and species are listed as threatened under both State and Commonwealth legislation in the region. Areas of remaining native vegetation are often of high conservation value, but at the same time, the population of Geelong is growing, and housing availability and affordability is a priority.

These issues make it challenging to identify options that satisfy regulatory and community expectations around biodiversity conservation while also addressing the need for cost effective development.

Strategic assessment processes provide significant opportunities to address the key conservation challenges in the Victorian Volcanic Plain bioregion while facilitating cost effective development.

Strategic assessments can have the following benefits:

* Streamline the assessment and approval process and reduce duplication between regulatory requirements
* 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
* Manage threats at a landscape scale that can maximise benefits to multiple species
* Be designed and implemented strategically, such as by consolidating offsets into large and more viable patches
* Be implemented ahead of impacts occurring from development, to help reverse any trend of decline

Conservation benefits of this Strategic Assessment are described in Chapter 8 below.

## Consideration of alternatives

This section describes the decision-making framework used in considering alternatives and developing conservation outcomes for the Plan.

Alternatives to the Plan can be discussed in terms of:

* Alternatives to the Growth Areas
* Alternative approaches to delivery of urban development
* Alternative conservation outcomes

### Alternatives to the Growth Areas

Alternatives to the Growth Areas can be considered at two levels:

* The ‘no action’ alternative (i.e., not delivering the Growth Areas at all)
* Alternative location and size of the Growth Areas

#### No action alternative

When considering alternatives, it is common to assess the possibility of not undertaking the proposed action, or in this case not delivering the Growth Areas. However, this is not considered to be a viable alternative as there is a strong need and justification for large areas of urban development to support Geelong’s projected future growth and the associated challenges (as explained in 6.4).

#### Alternative location and size of the Growth Areas

Identification of the Growth Areas (including their location and size) was determined through a detailed strategic state planning processes that aimed to address Geelong’s key planning challenges (as described in Sections 6.2 and 6.3). In summary:

* The locations of the two Growth Areas were first identified as ‘Future Investigation Areas’ in the *G21 Regional Growth Plan* (Geelong Region Alliance, 2013)
* The exact location and size of the Growth Areas and their and capacity to support Geelong’s projected growth and housing needs was defined in the *Greater Geelong Settlement Strategy 2020* (The City of Greater Geelong, 2021a)
* The Framework Plan was prepared to outline development of the Growth Areas and inform future PSPs for the Growth Areas (The City of Greater Geelong, 2021b)

These key planning processes were informed by numerous other state planning objectives and policies (see Section 6.3) and involved numerous consultation processes with the community and other stakeholders (described in Part 4, Chapter 26.4 of the SAR). Given the extensive pre-existing planning and decision-making process to determine the size and location of the Growth Areas, it was not considered necessary or economically feasible to evaluate other alternatives to the size and location of the Growth Areas as part of the strategic assessment process. Instead, the strategic assessment process focussed on evaluation of alternative conservation outcomes within the Growth Areas (as explained in Section 6.5.3 below).

### Alternative approaches to delivery of urban development

The Growth Areas provide large areas for greenfield urban development that were identified through various strategic planning documents (as described in Section 6.3). The Growth Areas represent a planned approach to delivery of urban development in Geelong. The City has taken responsibility for setting outcomes, planning, and co-ordinating the delivery of development for the Growth Areas.

Delivering the Growth Areas as one package is the most effective approach to address the key planning challenges facing Geelong (see Section 6.2) as it provides for a planned and strategic approach for urban development and allows for:

* Co-ordinated precinct structure planning and better integration of land use and transport to maximise social and economic benefits, including housing, employment, community facilities, transport networks, and open space
* More effective investment by infrastructure agencies when planning for services
* Better co-ordination and alignment between the objectives of different government agencies
* Better direction for the development industry about where future development will occur and greater certainty for landowners about the future use of their land
* A co-ordinated approach to development contributions to help fund the delivery of key infrastructure
* A more efficient use of local government resources when responding to development proposals

The alternative to the proposed approach for delivering the Growth Areas is a larger number of smaller urban precincts or projects that are separately identified and approved. This approach does not provide the benefits that come with the co-ordinated planning and approval, and consolidated development within the Growth Areas.

### Alternative conservation outcomes

As discussed above, the strategic planning process to identify and define the Growth Areas involved various levels of decision making, primarily through preparation of the Framework Plan which involved high-level design of the urban structure of the Growth Areas. However, development of the Plan through the strategic assessment process provided an opportunity to further consider alternative conservation outcomes within the Growth Areas based on updated information on biodiversity values.

The City reviewed the avoidance priorities of the Framework Plan and confirmed that:

* Further avoidance was needed for the NGGA to better avoid impacts to MNES and native vegetation
* The avoidance outcomes for WGGA are appropriate for MNES and native vegetation – this avoidance outcome has been incorporated into the Plan as the Cowies Creek Conservation Area

The City subsequently ran a structured decision making (SDM) project to consider further avoidance for the NGGA (Gregory *et al.*, 2010). The SDM project addressed the following question:

*“What is the optimal layout of development and avoidance within the Northern Geelong Growth Area?*”

It did this by considering five decision objectives and eleven performance criteria. The decision objectives covered environmental, social, and economic issues and were:

1. Avoid the loss of biodiversity
2. Maximise the protection and management of biodiversity
3. Maximise community access to infrastructure and the delivery of 20 minute neighbourhoods
4. Minimise the cost of the conservation program
5. Maximise the supply of affordable housing delivered in the precinct

The project considered five different alternative layouts and scales of avoidance across the NGGA. The layout that performed best has been incorporated into the Plan as the NGGA Conservation Area.

# Development under the Plan

## Introduction

This Chapter describes the development that is proposed under the Plan including details of the following:

* Where development can occur
* Development actions that are supported by the Plan
* Development that is not covered by the Plan
* A description of external infrastructure
* Who can undertake development and their requirements

### Commmitments for Development

The Plan’s commitments for development are provided in Table 7‑1. The measures to implement these commitments are described in the Commitments and Measure document.

Table 7‑1: Commitments for development

|  |  |
| --- | --- |
| **No.** | **Commitment** |
| 1 | Development within the Strategic Assessment Area will proceed in accordance with any Commonwealth approval conditions and generally in accordance with the EPBC Plan and NWGGA Biodiversity Conservation Strategy |
| 2 | Proposed minor changes to the boundaries of land subject to development will meet the eligibility for consideration and be in accordance with the process for considering changes set out in Section 4.5 of the Plan |

## Location of development

The strategic assessment area scope, size and location is described Part 1 (Section 3.2)

Refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf) for a map showing the development land within the Strategic Assessment Area

### Development in the Growth Areas

Development under the Plan is only proposed to occur within specific locations in the Strategic Assessment Area (development land). This includes:

* ‘Land subject to development’ within the Growth Areas. Development within this land is proposed for all classes of actions (see Section 7.3)
* The ‘NGGA Conservation Area’ within the avoided land in the NGGA. Development within this area is restricted to the environmental management class of actions (see Section 7.3.5)
* The ‘Cowies Creek Conservation Area’ and Moorabool River Corridor within the avoided land in the WGGA. Development within these areas is restricted to the environmental management class of actions and limited activities under the supporting infrastructure and services class of actions (see Sections 7.3.4 and 7.3.5)

The Plan provides a process to allow minor changes to the boundaries of land subject to development where this is necessary to address planning issues during the preparation of PSPs. Provided these changes are made in accordance with the requirements of the Plan, any impacts of these changes on MNES are covered by the Part 10 EPBC approval associated with the Plan and additional approval is not required under Part 9 of the EPBC Act.

Proponents of the boundary change may include the City, developers, or infrastructure providers.

The process for allowing minor boundary changes is set out in Section 4.5 of the Plan. This process requires any changes to meet the eligibility for consideration and be in accordance with the process for considering changes set out in this section.

### External infrastructure development

Some development – called ‘external infrastructure development’ – may occur outside the Growth Areas within the Strategic Assessment Area. This development is limited to the supporting infrastructure and services class of actions and the environmental management class of actions (see Sections 7.3.4 and 7.3.5)

The Plan shows indicative locations where external infrastructure development is intended to occur (Refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)) and includes a set of commitments to ensure this development is located to avoid and minimise impacts to MNES.

The delivery of external infrastructure development is described further in Chapter 6 of the Plan.

## Development classes of actions

There are five classes of actions for development under the Plan:

* Urban and commercial development
* Industrial development
* Rural development
* Supporting infrastructure and services
* Environmental management

Each class of actions includes a number of broad ‘development types’ under which a variety of specific ‘impact activities’ (as defined in the *Victoria Planning Provisions*) may be undertaken. Examples of specific impact activities for each development type are provided in Chapter 4 of the Plan.

Certain development and actions are also considered to be outside the scope of the Plan (see Section 7.3.6).

### Urban and commercial development

The urban and commercial development class of actions covers actions and activities associated with residential and commercial areas. It includes the construction, operation, maintenance, and decommissioning of the following:

* Residential buildings and accommodation
* Education centres
* Leisure and recreation premises
* Offices
* Places of assembly and public buildings
* Retail premises
* Community services

All activities under the urban and commercial development class of actions can only occur within the land subject to development (refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)).

### Industrial development

The industrial development class of actions covers actions and activities associated with the construction and operation of facilities for industrial use. It includes the construction, operation, maintenance, and decommissioning of:

* Industry
* Warehouses
* Energy generation

All activities under the industrial development class of actions can only occur within the land subject to development (refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)).

### Rural development

The rural development class of actions covers actions and activities associated with the use of rural land for agriculture and associated activities. Examples of the types of activities included under this CoA include:

* Grazing animal production
* Animal training
* Domestic animal husbandry
* Horticulture
* Market garden
* Saleyard
* Winery

All activities under the rural development class of actions can only occur within the land subject to development (refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)).

### Supporting infrastructure and services

The supporting infrastructure and services class of actions covers actions and activities that are required to facilitate and support all other types of development. This covers a wide range of activities including (but not limited to) those required for the supply of water, electricity, fuel, transport, telecommunications, the removal of waste, as well as safety interventions like erosion prevention. It includes the construction, operation, maintenance, and decommissioning of:

* Transport terminals
* Utility installation
* Supporting infrastructure

All activities under the supporting infrastructure and services class of actions can only occur within the following locations (except where this is external infrastructure development – see below) (refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)):

* Land subject to development
* Cowies Creek Conservation Area (noting the limited scope of permissible activities outlined below)
* Moorabool River Corridor (noting the limited scope of permissible activities outlined below)

Within Cowies Creek Conservation Area and Moorabool River Corridor, the following specific impact activities (as defined in the VPP) are not permissible under the supporting infrastructure and services class of actions:

* All activities included within the ‘transport terminals’ category under the VPP
* The following activities included within the ‘utility installation’ category under the VPP:
  + Data centre
  + Telecommunications facility
* All activities included within ‘transport system’ under the VPP (except for cycling paths and footpaths and their associated infrastructure)
* The following specific impact activities (as defined in the VPP):
  + Car park
  + Freeway service centre
  + Helicopter landing site

Within the Cowies Creek Conservation Area and Moorabool River Corridor, development under this class of actions must also be undertaken in accordance with the following principles and standards:

* Development does not prevent the achievement of any environmental objectives, outcomes, commitments or management actions established for the areas
* Development does not directly impact habitat for MNES
* Potential indirect impacts are minimised as much as possible by implementing mitigation measures

In addition, for the Cowies Creek Conservation Area, opportunities to enhance the MNES values of the conservation area are maximised in the design and planning process for the class of actions.

#### External infrastructure development

External infrastructure development includes the supporting infrastructure and services class of actions where that is located outside the Growth Areas within the Strategic Assessment Area. [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf) shows indicative locations where external infrastructure development is intended to occur.

The delivery of external infrastructure development is described further in Chapter 6 of the Plan and summarised in Chapter 8.6.

### Environmental management

The environmental management class of actions covers actions and activities that are required to facilitate environmental management under the Plan. The types of activities included under this CoA include:

* Constructing and managing wetlands to provide habitat for the Growling Grass Frog in the Cowies Creek Conservation Area
* Biomass reduction to manage native grasslands (such as controlled burns and sheep grazing)
* Pest plant and animal control works
* Revegetation activities (such as direct seeding) to restore degraded vegetation
* Exclusion fencing
* Signage
* Paths or tracks required for management activities

All activities under the environmental management class of actions can only occur within the following locations (except where this is external infrastructure development – see below) (refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)):

* Land subject to development
* NGGA Conservation Area
* Cowies Creek Conservation Area
* Moorabool River Corridor

Activities under this class of actions must be undertaken in accordance with the following principles and standards:

* Activities will only be undertaken only where it is sympathetic to or enhances habitat values or attributes for MNES
* Activities are consistent with any environmental objectives, outcomes, commitments or management actions established for the relevant areas
* The overall benefit of the activities is greater than the potential impacts
* The activities will be consistent with relevant best practice methods or guidelines, such as the *Growling Grass Frog Habitat Design Standards* (DELWP, 2017a) and other relevant MNES standards as relevant (noting that these are likely to change and/or be updated throughout implementation of the Plan)
* The mitigation hierarchy is applied to ensure any negative impacts are avoided and mitigated as much as practicable while still allowing the necessary environmental management activity to be undertaken

#### External infrastructure development

External infrastructure development includes the environmental management class of actions where that is located outside the Growth Areas within the Strategic Assessment Area. [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf) shows indicative locations where external infrastructure development is intended to occur.

The delivery of external infrastructure development is described further in Chapter 6 of the Plan and summarised in Chapter 8.6.

### Development not covered by the Plan

Development that is not covered the Plan includes the following:

* Actions that are already approved under the EPBC Act
* Actions that do not require approval under the EPBC Act because:
  + They have prior authorisation or are subject to continuing use provisions (in accordance with sections 43A and 43B of the EPBC Act)
  + They are within the scope and are undertaken in accordance with a previous referral that was determined to be ‘not a controlled action’ under Part 7 of the EPBC Act
* Any classes of actions that are not described in the Plan
* The following specific impact activities (as defined in the VPP) that were considered in the planning process for the strategic assessment and excluded from the Plan:
  + Airport
  + Aquaculture
  + Broiler farm
  + Cattle feedlot
  + Heliport
  + Intensive animal production
  + Intensive dairy farm
  + Marine dredging
  + Pig farm
  + Poultry farm
  + Poultry hatchery
  + Reservoir
  + Rice growing
  + Timber production
  + Wharf
  + All activities included within the ‘earth and energy resources industry’ category under the VPP
  + All activities included within the ‘recreational boat facility’ category under the VPP
  + All activities included within the ‘energy’ category under the VPP (except for solar energy facility which is permitted under the industrial development class of action, see Table 4-3 in the Plan)

If actions that have been excluded from the scope of the Plan are proposed to take place within the Plan area in the future, they will be subject to separate assessment and approval under the EPBC Act.

## Persons who can undertake development and their obligations

Any person can undertake development within the Plan area and access the associated Part 10 EPBC approval provided the following requirements are met:

* Development must comprise the classes of actions as defined in this Chapter
* Development must only occur in the development land as defined in this Chapter
* Development must proceed in accordance with any Commonwealth conditions of approval
* Development must proceed generally in accordance with the Plan, including the avoidance and minimisation, mitigation and offset requirements of the Plan
* Developers must pay any required biodiversity levy (see Section 7.4 of the Plan)
* Development must be registered in accordance with the developer registration system (see Section 7.5.3 of the Plan)

Development that does not meet these requirements may need separate approval under the EPBC Act.

The Victorian planning system is the key delivery framework for implementing the Plan (see Section 2.3 of the Plan). The planning system has a key role in ensuring regulated third-parties (developers) undertake development under the Plan in accordance with the Commonwealth approval conditions and requirements of the Plan.

The Commitments and Measures document details the specific measures that will be taken to ensure the Plan’s requirements are incorporated in the Greater Geelong Planning Scheme.

# Conservation framework

## Introduction

This Chapter outlines the conservation framework for the Plan, including:

* Overview of the conservation framework
* Avoidance and minimisation of impacts
* Mitigation of impacts
* Residual impacts and offsets
* Delivery of external infrastructure

Section 5 of the Plan provides a detailed description of the conservation framework.

## Overview of the conservation framework

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 in the Strategic Assessment Agreement
* The Plan’s biodiversity-related outcomes for MNES are achieved

The Plan’s conservation framework for protecting MNES has been developed in accordance with the offset mitigation hierarchy (DSEWPC, 2012). 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.

The conservation framework set outs the commitments that will be delivered for:

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

The conservation framework is supported by a range of implementation mechanisms to ensure its delivery. These are summarised in Chapter 9.

Part 5 of the SAR provides an evaluation of the adequacy of conservation program in addressing the impacts of the development.

### Implementation of the conservation framework

The Plan’s conservation framework for protecting MNES will be implemented through a series of commitments and measures that are set out in this Chapter and provided in the Commitments and Measures document. Further description of the measures and their implementation are provided in the BCS.

Refer to Section 5 of the Plan for further details of the conservation framework and its implementation.

## Avoidance and minimisation of impacts

### Context

Avoiding and minimising impacts to MNES is the first step in the offset mitigation hierarchy. The avoidance process provides opportunities to avoid and protect areas of high biodiversity value and is fundamental to a determination that commitments adequately address the likely impacts on MNES and reducing the need for offsets.

There may be several reasons why land is avoided, including because land:

* Has high biodiversity values and is avoided for biodiversity purposes
* Is not strategically located and is therefore not a priority for development
* Is not generally suitable for development for another reason such as topography or land use conflict

Avoidance is defined in the Plan as any land not directly impacted by development within the Growth Areas.

Avoidance is described in detail in the BCS, and avoidance outcomes for MNES are described and justified in the Part 4 of the SAR.

### Commitments for avoidance and minimisation

The Plan’s commitments for avoidance and minimisation are provided in Table 8‑1. The detailed measures for implementing these commitments are provided in the Commitments and Measures document.

Table 8‑1: Commitments for avoidance

| **No.** | **Commitment** |
| --- | --- |
| 3 | The NGGA Conservation Area will be established in perpetuity to avoid and protect 74 ha of habitat for Striped Legless Lizard and 108 ha of habitat for Golden Sun Moth |
| 4 | A Conservation Management Plan will be prepared and implemented for the protection and ongoing management of Striped Legless Lizard and Golden Sun Moth within the NGGA Conservation Area |
| 5 | The Cowies Creek Conservation Area will be established in perpetuity to avoid and protect habitat needed to support the continued persistence of the Growling Grass Frog in the WGGA |
| 6 | A Conservation Management Plan will be prepared and implemented for the protection and ongoing management of Growling Grass Frog and areas of potential habitat for Adamson's Blown-grass within the Cowies Creek Conservation Area |

Refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf) for the locations of the NGGA Conservation Area in the NGGA and Cowies Creek Conservation Area in the WGGA.

## Mitigation of impacts

### Context

Mitigating impacts to MNES is the second step in the offset mitigation hierarchy. The mitigation process reduces how likely or significant unavoidable impacts may be and further reduces the need for offsets.

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, litter, 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 or introduction of weeds

The Plan includes commitments to ensure each of these indirect impacts is mitigated. These commitments are expected to substantially reduce the risk of residual impacts to MNES associated with these indirect impacts to the extent that offsets for these impacts are not required (see Part 4 of the SAR).

### Commitments for mitigation

The Plan’s commitments for mitigation are provided in Table 8‑2. The detailed measures for implementing these commitments are provided in the Commitments and Measures document.

Table 8‑2: Commitments for mitigation

| **No.** | **Commitment** |
| --- | --- |
| 7 | Standard mitigation measures will continue to be implemented to minimise the indirect impacts of the development on MNES in accordance with the requirements of the *Greater Geelong Planning Scheme* (The City of Greater Geelong, 2022), as updated from time to time, and generally in accordance with the Framework Plan (The City of Greater Geelong, 2021) |
| 8 | The following additional specific mitigation measures will be implemented to minimise the indirect impacts of development on the NGGA Conservation Area and Cowies Creek Conservation Area:   * Establish a conservation interface for the conservation areas * Design and baffle public lighting to prevent light spill and glare within the Cowies Creek Conservation Area * Prepare Construction Environmental Management Plans for construction works on land immediately adjacent to the conservation areas |
| 9 | Additional specific mitigation measures will be implemented to minimise the indirect impacts of the development on MNES 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 |

## Residual impacts and offsets

### Context

Offsetting impacts to MNES is the final step in the offset mitigation hierarchy. Offsetting is intended to compensate for any residual impacts that remain after impacts have been avoided and minimised, and mitigated.

A detailed impact assessment of development under the Plan has been undertaken in Part 4 of the SAR. This impact assessment determined that there will be residual impacts in the NGGA to Natural Temperate Grassland, Golden Sun Moth, and Striped Legless Lizard (summarised in Section 8.5.2).

The Plan establishes a strategic offsets approach that aims to maximise the benefits to MNES. It does this through two key approaches to ensure the Plan’s outcomes are achieved:

* Prioritising offsetting early in the life of the Plan to reduce the risk that impacts occur head of the benefits gained through offsets and to secure values in the landscape ahead of a background a rate of decline
* Focusing offsets on large patches of native vegetation and habitat that are well located in the landscape from a biodiversity perspective, including sites that:
  + Occur within key biodiversity corridors and improve connectivity across the landscape
  + Are connected to existing conservation reserves

Conservation planning science (for example, see (Gordon, Langford et al., 2011)) confirms the benefits of strategic approaches and supports the position that the Plan’s approach to offsets will be substantially stronger than what would occur under standard project-by-project approvals.

The BCS includes further justification for this strategic approach to offsetting and a summary of the results of analysis that was done to determine the adequacy of the offset targets reflected in the offset commitments in the Plan (see Section 5.6.3 of the Plan) in combination with the overall design of the offsets program.

### Residual impacts from the development within the growth Areas

The development under the Plan will result in the clearance and direct loss of the following MNES in the NGGA:

* Natural Temperate Grassland – 18.6 ha
* Golden Sun Moth (*Synemon plana*) – 657.7 ha
* Striped Legless Lizard *(Delma impar*) – 153.4 ha

There will be no residual impacts to MNES in the WGGA and offsets are not required for that Growth Area (refer to Part 4 of the SAR).

The residual impacts within the NGGA will result from clearing of native vegetation and species habitat during construction of the development. The impacts will be permanent due to the ongoing use of the developed land. A detailed assessment of the residual impacts of the development on MNES is provided in the Part 4 of the SAR.

### Commitments for offsets

The Plan’s commitments for offsetting residual impacts are provided in Table 8‑3. The detailed measures for implementing these commitments are provided in the Commitments and Measures document.

The amount of offsets reflected in the commitments was determined in accordance with the principles of the EPBC Act Offsets Policy (DSEWPC, 2012). A detailed explanation and justification of the offset targets and the consistency of the offsets package with the principles of the EPBC Act Offsets Policy is provided in the BCS.

Table 8‑3: Commitments for offsetting

| **No.** | **Commitment** |
| --- | --- |
| 3 | The NGGA Conservation Area will be established in perpetuity to avoid and protect 74 ha of habitat for Striped Legless Lizard and 108 ha of habitat for Golden Sun Moth |
| 4 | A Conservation Management Plan will be prepared and implemented for the protection and ongoing management of Striped Legless Lizard and Golden Sun Moth within the NGGA Conservation Area |
| 10 | Offset sites will be established in strategic locations to protect and manage a minimum of the following amounts of habitat to support the following MNES:   * 45 ha of Natural Temperate Grassland * 375 ha of known habitat for Striped Legless Lizard * 585 ha of known habitat for Golden Sun Moth |
| 11 | Within the first five years of Plan implementation the City of Greater Geelong will secure the following offsets at a minimum:   * 100% of the offset requirement for Natural Temperate Grassland * 70% of the offset requirement for Striped Legless Lizard * 50% of the offset requirement for Golden Sun Moth |
| 12 | Offset delivery will keep pace with and occur ahead of impacts within the NGGA |

## Delivery of external infrastructure

### Introduction

This Chapter outlines the delivery of external infrastructure for the Plan.

Section 6 of the Plan provides a detailed description of the delivery of external infrastructure.

### Overview of external infrastructure

Some development – called ‘external infrastructure development’ – may occur outside the Growth Areas within the Strategic Assessment Area. This development is limited to the supporting infrastructure and services class of action and the environmental management class of action (see Sections 7.3.4 and 7.3.5).

External infrastructure development is required to support the urban development within the Growth Areas and help deliver the development objectives of the Framework Plan.

Planning for essential infrastructure development for the Growth Areas is in various stages and the specific locations and the types of external infrastructure that will be needed are not yet known.

The Plan shows indicative locations where external infrastructure development is intended to occur (Refer to [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)**)**. These include:

* Corridors along Staceys Road, Bacchus Marsh Road, Anakie Road, Midland Highway, and Evans Road to facilitate road and intersection upgrades
* Corridors adjacent to Cowies Creek and Tower Hill Drive to facilitate shared trail upgrades
* Stormwater related infrastructure associated with Hovells Creek, Elcho Road drain and Wharf road outfall

These indicative locations have not been surveyed and the biodiversity values of these areas is not confirmed.

While the specific locations and potential impacts of external infrastructure are not yet confirmed, the Plan includes a set of commitments that, along with their associated measures, will establish a process to ensure that external infrastructure development will avoid and minimise, mitigate, and offset any residual impacts to MNES.

### Commitments for external infrastructure

The Plan’s commitments for external infrastructure development are provided in Table 8‑4. See the Commitments and Measures document for measures relating to external infrastructure development.

Table 8‑4: Commitments for external infrastructure development

|  |  |
| --- | --- |
| **No.** | **Commitment** |
| 13 | External infrastructure development will be designed and located to avoid and minimise impacts to MNES and native vegetation. The following specific avoidance outcomes will be delivered:   * Spiny Rice-flower – any confirmed population or part of the population must be avoided and will be protected, maintained and managed to ensure the persistence of that population in the long-term * Other MNES – any confirmed population or occurrence that would be considered important or notable (for instance, due to size, condition or potential contribution to the recovery of the MNES) must be avoided and will be protected, maintained and managed to ensure the persistence of that population or occurrence in the long-term. Impacts to all other populations or occurrences will be avoided and minimised as far as practical |
| 14 | Unavoidable clearing due to the external infrastructure development of any areas confirmed to support MNES 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) |

# Assurance and implementation framework

## Introduction

This Chapter outlines the assurance and implementation framework for the Plan, including:

* Governance framework
* Funding framework
* Monitoring, evaluation and reporting and improvement (adaptive management) framework
* Compliance framework

Section 7 of the Plan provides a detailed description of the assurance and implementation framework.

The Plan’s assurance and implementation framework will be implemented through the detailed set of measures which are described in the Commitments and Measures documents, and through the Funding Program, which act as implementation documents for the Plan (see Section 5.2).

## Governance framework

Governance is a key part of the Plan’s assurance and implementation framework. It will ensure the objective and outcomes of the Plan are achieved, and the commitments and measures are efficiently and effectively implemented.

The Plan establishes a governance framework to ensure implementation of the Plan complies with Commonwealth approval conditions, is transparent and accountable, and is efficient and effective.

The governance framework includes a governance structure, and governance mechanisms and processes.

### Commitments for governance

The Plan’s commitments for governance are provided in Table 9‑1. The measures to deliver the Plan’s governance commitment are set out in the Commitments and Measures document**.**

Table 9‑1: Commitments for governance

|  |  |
| --- | --- |
| **No.** | **Commitment** |
| 15 | Governance arrangements will be established to implement the Plan, consistent with the Plan’s governance framework |
| 16 | A Stakeholder Engagement Strategy will be developed to guide engagement with key stakeholders on the implementation of the Plan |

## Funding framework

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 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
* Provision of upfront funding from the City into the implementation fund to secure and manage a substantial proportion of the offsets for MNES early during early implementation of the Plan
* Full recovery of the costs incurred by the City in 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

The proposed funding arrangements are described in Section 7.4 of the Plan. A Funding Program (see Section 5.2.3) 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.

### Commitments for funding

The Plan’s commitment for funding is provided in Table 9‑2.

Table 9‑2: Commitment for funding

|  |  |
| --- | --- |
| **No.** | **Commitment** |
| 17 | Funding arrangements will be established to fund the implementation of the Plan's commitments and measures over the life of the Plan, consistent with the Plan's funding framework |

All the commitments in the Plan will require funding over the life of the Plan. The key commitments that will require funding to protect MNES are those which relate to:

* Offset establishment, management, monitoring and audit
* Securing and managing the NGGA Conservation Area and Cowies Creek Conservation Area
* Implementing conservation measures
* Implementing the MERI framework and compliance framework

The measures to deliver the Plan’s Funding commitment are set out in the Commitments and Measures document**.**

## MERI framework

Monitoring, evaluation, reporting and improvement (MERI) is a key component of the Plan’s assurance and implementation framework. MERI provides a system for understanding how well a policy, plan or program is performing, communicating that to regulators and the public, and adapting implementation as needed.

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.

The MERI framework for the Plan is comprised of the following components:

* Monitoring
* Evaluation
* Reporting
* Improvement (adaptive management)

The purpose of the MERI framework for the Plan is to:

* Provide transparency and accountability for implementation of the Plan
* Determine whether the:
  + Plan’s objective and outcomes are being achieved
  + Plan’s commitments to achieve the objective and outcomes are efficient and effective
  + Measures set out in this document and the BCS to achieve the Plan’s commitments are efficient and effective
* Enable new information over the life of the Plan to be assessed and integrated into implementation
* Adaptively improve implementation of the Plan where necessary to ensure the objective and outcomes are achieved

### Commitments for MERI

The Plan’s commitments for MERI are provided in Table 9‑3. The measures to deliver the Plan’s MERI commitment are set out in the Commitments and Measures document**.**

Table 9‑3: Commitments for MERI

|  |  |
| --- | --- |
| **No.** | **Commitment** |
| 18 | A MERI program will be implemented over the life of the Plan, consistent with the Plan's MERI framework |
| 19 | A development registration system will be developed and implemented to track development under the EPBC Part 10 approval |

## Compliance framework

A robust compliance framework is critical to the successful implementation of the Plan. The purpose of the compliance framework is to ensure the City achieves the Plan’s outcomes and delivers the commitments and regulated third-parties undertake approved actions under the endorsed Plan in accordance with the Commonwealth approval conditions.

### Commitments for compliance

The Plan’s commitment for compliance is provided in Table 9‑4. The measures to deliver this commitment are set out in the Commitments and Measures document.

Table 9‑4: Commitment for compliance

|  |  |
| --- | --- |
| **No.** | **Commitment** |
| 20 | A compliance program will be implemented over the life of the Plan, consistent with the Plan's compliance framework |

References

ABS (2020) *Region summary: Geelong*. Available at: https://dbr.abs.gov.au/region.html?lyr=sa4&rgn=203.

DELWP (2017a) ‘Growling Grass Frog Habitat Design Standards Melbourne Strategic Assessment’. Department of Environment, Land, Water and Planning.

DELWP (2017b) ‘Guidelines for the removal, destruction or lopping of native vegetation’.

DSE (2003) ‘Biodiversity Action Planning: Strategic Overview for the Victorian Volcanic Plain Bioregion’. Victorian Government Department of Sustainability and Environment.

DSEWPC (2012) ‘Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy’.

EHP (2021) ‘Existing Ecological Conditions: Northern and Western Geelong Growth Areas’. Prepared for the City of Greater Geelong.

Geelong Region Alliance (2013) ‘G21 Regional Growth Plan’. G21 Geelong Region Alliance.

Gordon, A. *et al.* (2011) ‘Assessing the impacts of biodiversity offset policies’, *Environmental Modelling & Software*, 26(12), pp. 1481–1488. Available at: https://doi.org/10.1016/j.envsoft.2011.07.021.

Gregory, R. *et al.* (2010) *Structured Decision Making: A practical guide to environmental management choices*. Wiley-Blackwell.

Informed Decisions (2022) *City of Greater Geelong - Housing Monitor*. Available at: https://housing.id.com.au/geelong.

Parliament of Australia (2021) *Australia’s population: recent changes*, *Commonwealth of Australia*. Available at: https://www.aph.gov.au/About\_Parliament/Parliamentary\_departments/Parliamentary\_Library/pubs/BriefingBook47p/AustraliasPopulationRecentChanges.

Ratio (2022) *Geelong Residential Supply and Demand Assessment*. Available at: https://ratio.com.au/geelong-residential-supply-and-demand-assessment/.

The City of Greater Geelong (2008) ‘Housing Diversity Strategy’. Prepared by the City of Greater Geelong in conjunction with alphaPlan and David Lock Associates.

The City of Greater Geelong (2018) ‘Council Plan 2018-22: Putting Our Community First’. City of Greater Geelong.

The City of Greater Geelong (2021a) ‘Settlement Strategy’. City of Greater Geelong.

The City of Greater Geelong (2021b) ‘The Northern and Western Geelong Growth Areas Framework Plan.’

The City of Greater Geelong (2022) *A clever and creative future*. Available at: https://www.geelongaustralia.com.au/clevercreative/default.aspx (Accessed: 2 November 2022).

Victoria State Government (2017) ‘Plan Melbourne 2017-2050’.



MAY 2023

DRAFT NWGGA STRATEGIC ASSESSMENT REPORT

PUBLIC EXHIBITION VERSION

PART 3: ASSESSMENT APPROACH

PREPARED FOR THE CITY OF GREATER GEELONG

DOCUMENT TRACKING

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| **VERSION CONTROL:** | |
| VERSION: | Public exhibition version |
| DATE: | May 2023 |

Contents

[List of Tables ii](#_Toc134715599)

[PART 3: ASSESSMENT APPROACH 10-1](#_Toc134715600)

[10 Introduction 10-1](#_Toc134715601)

[11 Identifying relevant potential impacts 11-1](#_Toc134715602)

[11.1 Summary of development under the Plan 11-1](#_Toc134715603)

[11.2 Description of impact types and the approach to assessing them 11-2](#_Toc134715604)

[11.3 Identification of relevant EPBC key threatening processes and threat abatement plans 11-7](#_Toc134715605)

[12 Identifying the protected matters relevant to the assessment 12-1](#_Toc134715606)

[12.1 Introduction 12-1](#_Toc134715607)

[12.2 Requirements for identifying protected matters 12-1](#_Toc134715608)

[12.3 Methods for identifying the relevant protected matters 12-1](#_Toc134715609)

[13 Data used in the assessments for relevant protected matters 13-1](#_Toc134715610)

[13.1 Introduction 13-1](#_Toc134715611)

[13.2 Key data sources 13-1](#_Toc134715612)

[13.3 Use and interpretation of data 13-8](#_Toc134715613)

[14 Addressing uncertainty and risk 14-1](#_Toc134715614)

[14.1 Knowledge gaps in scientific understanding and responding to new knowledge 14-1](#_Toc134715615)

[14.2 Assumptions made in assessing potential impacts and benefits 14-2](#_Toc134715616)

[14.3 How changes to State and Commonwealth legislation, policies, plans and advice is to be accounted for in the management of the areas impacted by the Plan 14-3](#_Toc134715617)

[14.4 Capacity to ensure the Plan is implemented 14-3](#_Toc134715618)

[14.5 Adaptive management under the Plan 14-3](#_Toc134715619)

[References A](#_Toc134715620)

List of Tables

[Table 11‑1: Indirect impact types potentially associated with the Plan 11-4](#_Toc134513413)

[Table 13‑1: Data sets used in the Assessment Report 13-6](#_Toc134513414)

PART 3: ASSESSMENT APPROACH

# Introduction

This Strategic Assessment Report has been developed to meet the Terms of Reference (ToR) and provide a robust, defendable, clear and transparent assessment of the potential impacts of the Classes of Action (CoAs) on matters protected under the EPBC Act.

The purpose of Part 3 of the SAR is defined by the ToR, which state that the report needs to:

* Assess the impacts of actions under the Plan on all relevant protected matters
* Address how those impacts will be avoided, mitigated, and offset (where necessary or appropriate) to ensure the long-term protection of protected matters
* Provide sufficient detail to enable an evaluation of the ability of the Plan to ensure the long-term protection and conservation of the relevant protected matters
* Use methods that are appropriate for assessment at a strategic scale, rely on the best available information and discuss uncertainty, including with reference to the data and information that is relied upon

Additional key themes for Part 3 of the SAR drawn from the ToR include:

* The use and definition of methods that are justifiable and evidence based
* The need to identify and assess areas of uncertainty and risk
* The need to assess consistency with the key legislative requirements of the EPBC Act

This part (Part 3) of the assessment report provides an overview of the approach to assessing the CoAs. The approach is structured around the following elements:

* Identifying the relevant potential impacts of development under the Plan (Chapter 11)
* Identifying the protected matters that may be affected by development under the Plan (Chapter 12)
* Using best available information to understand the occurrence and distribution of MNES values to enable an assessment of potential impacts on those values (Chapter 13)
* Using approaches that adequately identify and address uncertainty and risks (Chapter 14)

# Identifying relevant potential impacts

This chapter:

* Summarises the types of development under the Plan in order to provide context about potential impacts
* Identifies, defines, and describes the impacts which have the potential to occur under the Plan and provides a high level description of the approach used to assess the impact types
* Identifies potentially relevant Key Threatening Processes (KTPs) and Threat Abatement Plans (TAPs)

It is noted that detailed assessments of potential impacts on the relevant protected matters are contained later in Part 4 of this Assessment Report.

The relevant items in the ToR relating to the identification of potential impacts and approach to assessing them are outlined in the following text box:

|  |
| --- |
| *4.1. The Report must describe and assess the likely direct, indirect, and cumulative impacts of actions taken under the Plan on all relevant protected matters. This must include, but not necessarily be limited to, an assessment of impacts of clearing, disturbance, and fragmentation*  *…*  *4.6. The Report must consider the extent to which the impacts on relevant protected matters of actions proposed under the Plan would be consistent with the EPBC Act, including but not limited to:*  *- how approving a class of actions to be taken in accordance with the Plan would not be inconsistent with recovery plans and threat abatement plans (section 146K(2) of the EPBC Act)*  *- how regard has been and will be given to relevant information in conservation advices (section 146K(3) of the EPBC Act), threat abatement plans and recovery plans* |

## Summary of development under the Plan

The relevant potential impacts of development under the Plan have been identified based on an understanding of the existing environmental context of the Strategic Assessment Area, as well an understanding of the scope and location of the Classes of Actions (CoAs) covered by the Plan.

### Location of the Strategic Assessment Area

The Strategic Assessment Area (SAA) defines the boundary within which development under the CoAs may occur. The majority of development will occur within the two Growth Areas (NGGA and WGGA), with some additional development occurring outside of the Growth Areas but within the SAA for external infrastructure development and conservation areas.

The SAA is located in a region on the north-western outskirts of Geelong. Chapter 3 in Part 1 provides a detailed description of the SAA locality and the environment relevant to the Plan.

### Classes of actions under the Plan

There are five CoAs that are included in the Plan. They are:

* Urban and commercial development
* Industrial development
* Rural development
* Supporting infrastructure and services
* Environmental management

Chapter 7 in Part 2 provides a description of each class of actions and where they can take place within the SAA.

## Description of impact types and the approach to assessing them

The Plan has the potential to result in three types of impacts which are assessed in this report:

* Direct impacts – which occur from the direct loss of individuals and/or habitat for threatened species, TECs or other protected matters through land clearing
* Indirect impacts – which include secondary impacts to protected matters which can occur adjacent to or downstream of development from either construction or operational phases of development under the Plan
* Cumulative impacts – which considers the combined effects of impacts from development under the Plan, in addition to existing and proposed development that is reasonably foreseeable within the wider region

Each of these impact types is further defined and described below.

### Direct impacts

For the purposes of this Assessment Report, direct impacts relate to the direct loss of relevant protected matters (such as threatened species and TECs) and their habitat due to land clearing which will occur under the Plan to facilitate development within the Growth Areas and the external infrastructure footprints. Land clearing is associated with the following CoAs under the Plan: urban and commercial development, industrial development, rural development, supporting infrastructure and services, and potentially environmental management.

Direct impacts may result in the mortality of individuals of protected species, loss of habitat for protected species, loss of areas of occurrence of TECs, or the fragmentation of habitat.

Direct impacts will occur:

* Within the areas subject to development within the NGGA and WGGA. The location of these areas is shown in [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)
* Within the external infrastructure footprints that occur outside of the Growth Areas and within the Strategic Assessment Area, as shown in [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)
* Within the NGGA Conservation Area and Cowies Creek Conservation Area, as shown in [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf). Direct impacts in these areas will be limited as much as possible and only permitted when facilitating positive environmental management (see Chapter 7 in Part 2)

#### Approach to assessing direct impacts

For the purposes of the assessment, it is assumed that all MNES values will be lost within the areas subject to development within the NGGA and WGGA as a result of direct impacts under the Plan. In reality, some retention and enhancement of MNES values and functions within the areas subject to development is likely. The BCS provides the strategy and process for delivering biodiversity protection within these areas; largely by delivering biodiversity co-benefits in areas that are less intensively developed (for example, along drainage lines). However, the extent and outcomes of this will not be defined until the time of precinct planning. This assessment has applied a precautionary approach in assuming loss of all MNES values within these areas given the current lack of detail and certainty around the outcomes that will be delivered.

Direct impacts have been calculated based on an overlay of:

* The areas subject to development within the Growth Areas, and
* The baseline mapping of MNES values that has been developed for the relevant MNES that are assessed in detail in Part 4 of this report

The assessment also recognises that some direct impacts associated with clearing may affect protected matters within the external infrastructure footprints. However, direct impacts to protected matters will be avoided to the fullest extent possible within these footprints, as informed by targeted surveys and detailed infrastructure design. Commitment 13 under the Plan restricts the total scale of direct impacts based on a set of avoidance prescriptions relating to particular MNES. The assessment of direct impacts to protected matters within the external infrastructure footprints assumes that clearing of MNES values may occur within these areas up to the allowable extent specified in Commitment 13 as a result of direct impacts.

A detailed assessment of direct impacts under the Plan on protected matters is contained within Part 4 of this Assessment Report. This detailed assessment includes the specific methods used to develop baseline mapping of values and assess direct impacts to each MNES, alongside an analysis of relevant avoidance, mitigation measures and offsets.

### Indirect impacts

For the purposes of this Assessment Report, indirect impacts are any impacts that could adversely affect biodiversity values beyond the development land. Table 11‑1 identifies the indirect impacts which have the potential to occur under the Plan, and the CoAs which are associated with them. A broad description of each indirect impact is also provided.

More detailed evaluation of each indirect impact (including duration, extent and likely severity) and consideration of how they may affect protected matters is included within Part 4 of this Assessment Report. An evaluation of relevant mitigation measures under the Plan for each indirect impact is also contained within Part 4.

#### Approach to assessing indirect impacts

A largely qualitative approach has been taken to the assessment of indirect impacts. This included assessing indirect impacts from the following three perspectives:

* As part of the analysis of the CoAs. This involved determining how the different CoAs under the Plan may lead to specific types of indirect impacts (see Table 11‑1), followed by considering how effectively these impacts will be mitigated under the Plan (see Chapter 17 of Part 4)
* As part of the identification of MNES relevant to the assessment. This involved considering any indirect impact pathways that might have the potential to affect the broad list of MNES that were determined to be potentially relevant to the assessment. The method used in identifying relevant MNES is described in Chapter 12, and the analysis and results are presented in Chapter 18 of Part 4
* As part of the detailed impact assessment for relevant MNES. This involved the identification of the range of threats to each MNES based on a review of key EPBC regulatory and policy documents, an assessment of whether development under the CoAs might indirectly introduce or exacerbate any of those threats, and the identification of the need for additional specific mitigation to address any risks posed. See the detailed assessments in Chapters 19 to 24 of Part 4

Table 11‑1: Indirect impact types potentially associated with the Plan

| **Indirect impact type** | **Urban/ Comm.** | **Industrial** | **Rural** | **Infra.** | **Environ.** | **Description** |
| --- | --- | --- | --- | --- | --- | --- |
| Water flows and quality |  |  |  |  |  | **Changes to surface water and groundwater flows**  Development under the Plan may lead to changes to surface water and groundwater flows. This is primarily related to:   * Disruption to natural flows and processes across land surfaces from buildings and infrastructure * Increase of hard surfaces leading to an increased volume of water entering downstream waterways * Diversion of surface water through flood mitigation works * Construction works involving large excavations   **Reduction in surface water and groundwater quality**  Development under the Plan may reduce surface water and groundwater quality. This is primarily related to:   * Stormwater run-off associated with urban, industrial, and agricultural land-uses * Sedimentation from soil disturbance due to construction works and land clearing * Disturbance to contaminated soils due to construction works * Management of spoil during construction   **Matters at risk of impacts**  Changes to water flows and quality can impact several biodiversity values. Species and TECs that rely on aquatic environments such as waterways and wetlands, riparian corridors, estuarine environments, and groundwater dependent ecosystems are particularly at risk. |
| Spread of infection/disease |  |  |  |  |  | Development under the Plan may increase the risk of the spread of infection/disease. This is primarily related to:   * Soil transportation on contaminated footwear, vehicles, and machinery, and in residential garden establishment * Earthworks and activities conducted during construction * Stormwater run-off associated with urban, industrial, and agricultural land-uses   Spread of infection/disease can affect species and have associated impacts on TECs. |
| Spread of weeds |  |  |  |  |  | Development under the Plan has the potential to increase the spread of weeds. This is primarily related to:   * Clearing which changes environmental conditions at the edges of habitat that favours weeds * Accidental dispersal of weed seeds/plant material into natural areas during construction or increased human access * Use of inappropriate species in landscaping and revegetation * Altered fire regimes   Species are most susceptible to this threat where development occurs adjacent to known populations or habitat. Weeds can reduce the viability of adjacent habitat or vegetation for listed species and TECs and can reduce the health of important habitat features. |
| Predation/ competition by pest/domestic fauna |  |  |  |  |  | Development under the Plan has the potential to increase the spread of pest fauna and/or access to natural areas by domestic fauna such as cats, dogs, and rabbits. This is primarily caused by:   * Clearing which changes environmental conditions at the edges of habitat that favours pest fauna * Clearing that creates new movement pathways that can be used by pest fauna to expand their range * Increased presence of domestic fauna (such as cats and dogs) associated with urban development   Increased presence of pest/domestic fauna can result in increased predation of native fauna, increased competition with native fauna, and increased habitat disturbance and disease transmission by pest fauna. |
| Altered fire regimes |  |  |  |  |  | Development under the Plan has the potential to alter fire regimes and increase fire risk. This is primarily related to:   * Increased burns for hazard reduction to protect assets, particularly within Asset Protect Zones * Reduced burns in some areas due to the risk to urban areas * Arson or the accidental lighting of fires associated with increased urban populations   Changed fire regimes can reduce habitat suitability for TECs and threatened species, affect foraging resources, and prey species, and cause direct mortality from heat and smoke. |
| Disturbance from increased public access to natural areas |  |  |  |  |  | Development under the Plan will increase human activity in the vicinity of the Growth Areas, which can impact natural areas including conservation areas protected under the Plan and existing reserves. This is primarily related to:   * Trampling of flora species and disturbance to flora and fauna habitat * Track creation * Rock removal and disturbance * Rubbish dumping and disturbance from associated clean-up activities * Timber collection and removal of dead wood * Illegal collection of flora and fauna species * Dog walking * Recreational activities such as mountain-biking, four-wheel driving, and horse riding * Water-based recreational activities such as fishing, boating and jet skiing   Species and TECs most at risk from this threat occur on land that is publicly accessible. |
| Fauna mortality and barriers to movement |  |  |  |  |  | Development under the Plan may increase the likelihood of fauna mortality and may introduce barriers to fauna movement. This is primarily related to:   * Direct mortality through vehicle strike or new structures, or secondary poisoning for pest control * Introduction of linear barriers such as fences, roads, and railways, which can affect fauna movement |
| Disturbance due to noise, dust, or light |  |  |  |  |  | Development under the Plan may increase noise, dust, and light. This is primarily related to:   * Construction activities, including use of heavy vehicles and machinery * Increased noise levels from traffic due to new roads or increased traffic on existing roads * Artificial light from urban areas   Increased noise can impact fauna species that vocalise or rely on hearing for hunting or breeding.  Artificial light can affect the behaviour of nocturnal and diurnal species and influence the abundance and behaviour of predators. Light can also disrupt flora species through interfering with plant growth signals.  Dust has potential to increase exposure of fauna to contaminants and can impact flora through smothering of leaves and disrupting photosynthesis. |
| Inadvertent impacts on adjacent habitat or vegetation |  |  |  |  |  | Development under the Plan may cause inadvertent impacts on adjacent habitat, vegetation, or important habitat features. This is primarily related to:   * Impacts adjacent to construction sites * Maintenance activities associated with roads, easements, or Asset Protection Zones * High frequency land management such as mowing and slashing or weed control |

### Cumulative impacts

Cumulative impacts relate to the combined impact of a range of activities within a region. Assessing cumulative impacts recognises that the combined effects of multiple activities on protected matters may be greater than the impact of an individual activity.

A cumulative impact assessment (CIA) for the protected matters relevant to the assessment is presented in Chapter 25 of Part 4 of this report. The approach to the CIA involved the following key components:

* An understanding of the potential cumulative impacts and key threatening processes for relevant protected matters
* A quantitative assessment of cumulative direct impacts of the actions taken under the Plan and other projects in the Study Area on relevant protected matters
* A qualitative assessment of cumulative impacts to relevant protected matters in the Study Area which considers potential direct impacts of smaller-scale developments, in addition to potential indirect impacts associated with development more broadly
* An evaluation of the adequacy of the Plan's proposed avoidance, mitigation, and offset commitments in relation to cumulative impacts for relevant protected matters

## Identification of relevant EPBC key threatening processes and threat abatement plans

Relevant Key Threatening Processes (KTP) and Threat Abatement Plans (TAP) have been identified as follows:

* All of the possible impacts related to the implementation of the Plan have been considered to determine whether there is a corresponding KTP listed under the EPBC Act
* All of the identified KTPs have been considered to identify whether a corresponding TAP has been prepared

The results of this analysis are presented in Chapter 17.

# Identifying the protected matters relevant to the assessment

## Introduction

This Chapter describes the methods for identifying the protected matters that have the potential to be impacted by development under the Plan. These are known as the ‘relevant protected matters’. The results of this process are presented in Chapter 18 of Part 4.

Matters on the Finalised Priority Assessment List (FPAL) for inclusion under the EPBC Act were also considered as part of this process.

Note that the other protected matters covered by the EPBC Act have not been considered here for the following reasons:

* Development under the Plan is not occurring within, or within the vicinity of, a Commonwealth marine area
* Development under the Plan is not occurring within, or within the vicinity of the Great Barrier Reef Marine Park
* Development under the Plan does not relate to nuclear actions (including uranium mines)
* Development under the Plan does not involve water resources that relate to coal seam gas development and large coal mining development

## Requirements for identifying protected matters

This Chapter addresses the following requirements outlined in the ToR:

|  |
| --- |
| *3.2. The Report must identify and describe each protected matter that may be impacted directly, indirectly and/or cumulatively by actions proposed to be taken under the Plan (these are the ‘relevant protected matters’)…*  *…*  *4.3. The Report may also consider protected matters that are potentially eligible for listing as a result of inclusion in a final priority assessment listing held by the Commonwealth, or a recommendation to the Minister for listing by the Threatened Species Scientific Committee prior to the Report being submitted* |

## Methods for identifying the relevant protected matters

Identification of the relevant protected matters was undertaken using different methods for each of the following groups:

* Commonwealth listed threatened species and species on FPAL
* Commonwealth listed threatened ecological communities (TECs) and communities on FPAL
* Commonwealth listed migratory species
* Wetlands of international importance (listed under the Ramsar Convention)
* Commonwealth land
* World heritage properties, national heritage properties

The methods are discussed below.

Matters that were considered relevant were assigned to ‘Category 1’ and assessed in detail in Part 4 of this report. Category 1 matters were those that were considered at risk of direct, indirect, or cumulative impacts due to implementation of the Plan.

Matters that were identified and examined, but determined not to be relevant were assigned to ‘Category 2’. These matters are not at risk of direct, indirect, or cumulative impacts due to implementation of the Plan or are not reliant on or present within the Strategic Assessment Area. For these matters, no further assessment is required.

### Threatened species and species on FPAL list

The method for identifying the threatened species and species on the FPAL list requiring a detailed impact assessment involved three steps. These included:

* Step 1: Identify the full list of threatened species and FPAL species potentially relevant to the assessment
* Step 2: Apply an initial set of criteria to refine this list. The purpose of this step was to remove species where they will clearly not be impacted directly, indirectly, or cumulatively
* Step 3: Undertake a preliminary assessment of the remaining threatened species and FPAL species to determine which ones may be impacted directly, indirectly, or cumulatively and will therefore require further detailed assessment in the report

#### Step 1: Identify the full list of potential species

The method for identifying the full list of species is intentionally broad to ensure all protected matters potentially relevant to the assessment are considered in the report. The full list of species was determined using:

* A report for the Study Area generated through the Commonwealth’s Protected Matters Search Tool (PMST)
* The Victorian Biodiversity Atlas (VBA) for known records of EPBC Act listed threatened species within the Study Area. The VBA records were downloaded in June 2022
* The list of species considered in the *Existing Ecological Conditions: Northern and Western Geelong Growth Areas* report (EHP, 2021) (the EHP report)
* A review of the current FPAL listings for species which are not currently listed under the EPBC Act, yet which are proposed to be listed as threatened

For the purposes of this method, the Study Area is taken to mean the area within a 20 km buffer of the Strategic Assessment Area (See [Map 3-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_3_Report_Maps.pdf)).

#### Step 2: Refining the list to remove matters that will clearly not be impacted

The following criteria was used to identify the threatened species that will clearly not be impacted directly, indirectly, or cumulatively by actions proposed to be taken under the Plan. Threatened species were excluded from any further assessment where they met all of these criteria:

1. The Study Area contains no known records or occurrences of the threatened species based on a search of the VBA and the results of field surveys undertaken by EHP (EHP, 2021)
2. The Study Area is outside the known or likely distribution of the threatened species, based on the Commonwealth’s distribution mapping as provided through the PMST report
3. The threatened species has been identified as having a ‘low’ or ‘unlikely’ likelihood of occurrence in the Likelihood of Occurrence Assessment presented in the EHP report (EHP, 2021)

For FPAL species, an initial review of the FPAL list was undertaken to identify FPAL species which occur within Victoria. All FPAL species which do not occur within Victoria were excluded from further assessment.

Of the FPAL species which occur within Victoria, a review of species’ records on the VBA was undertaken to determine whether species records occur within, or in proximity to, the Study Area. Where records did not occur within proximity to the Study Area, the FPAL species was not included for further assessment.

Note that some FPAL species are also listed as migratory under the EPBC Act. These species were not included within the FPAL categorisation process as they were considered as part of the migratory species categorisation and assessment.

#### Step 3: Preliminary assessment to identify matters requiring further detailed assessment

A preliminary assessment was undertaken for each of the threatened species and FPAL species that remained following step 2. The purpose of the preliminary assessment was to determine which matters *may be* impacted directly, indirectly or cumulatively, where the definition for ‘may be’has been adapted from the *EPBC Act Significant Impact Guidelines 1.1* (DoE, 2013)to be ‘where there is a real or not remote chance or possibility’ of an impact on the species.

The preliminary assessment identified the species at risk of potential direct impacts within the Growth Areas. These are the species that have been recorded or assumed present within the Growth Areas. The results of the EHP surveys (EHP, 2021), as well as other historical records, were used to identify these matters (see Chapter 13 for a brief overview of the EHP surveys and the use and interpretation of their findings in this assessment). These matters were automatically identified for further detailed assessment.

A range of additional factors were then considered for species that only occur outside of the Growth Areas to understand the potential for indirect or cumulative impacts, as well as the potential for further direct impacts where a species might occur within the external infrastructure footprints. These include:

* Whether there are any known indirect impact pathways associated with actions under the Plan that could affect the species
* The distance of known records from the Growth Areas
* The listing status of the species
* The number of known records for a species within the Study Area
* The relative importance of the Study Area compared with the broader distribution of the species, including factors such as endemism, edge-of-range, strongholds, important known sites, or habitats used for key life cycle stages

Where it is considered that there is ‘a real or not remote chance or possibility’ of direct, indirect, or cumulative impacts based on a review of these factors, the species was identified for further detailed assessment.

This approach to the preliminary assessment enabled an assessment of both the likelihood of a direct, indirect, or cumulative impact occurring, as well as the consequence to the species should an impact occur.

Overall, the species which were identified for further detailed assessment following application of the above methodology were assigned to Category 1. All species which were identified to not require further detailed assessment were assigned to Category 2.

### Threatened ecological communities and communities on FPAL list

#### Threatened ecological communities

The method for identifying the threatened ecological communities (TECs) requiring a detailed impact assessment involved three steps. These included:

* Step 1: Identify the full list of threatened ecological communities potentially relevant to the assessment
* Step 2: Determine the likelihood of TECs occurring within the Strategic Assessment Area
* Step 3: Undertake a preliminary assessment of the remaining threatened ecological communities to determine which ones may be impacted directly, indirectly, or cumulatively and will therefore require further detailed assessment in the report

##### Step 1: Identify the full list of threatened ecological communities potentially relevant to the assessment

The method for identifying the full list of TECSs was based on the Commonwealth’s PMST. A PMST report was produced for the extent of the Study Area to identify the TECs with a distribution that may occur within the Study Area.

##### Step 2: Determine the likelihood of TECs occurring within the Strategic Assessment Area

Key information sources used to determine the likelihood of a TEC identified in Step 1 occurring within the Strategic Assessment Area included:

* The results of targeted surveys including:
  + Surveys conducted by Ecology Heritage and Partners (EHP) within the Growth Areas (EHP, 2021) (see Section 13.2 of Chapter 13)
  + Additional survey data provided by the City
* Modelled Ecological Vegetation Classes (EVCs) (DELWP, 2005)
* Modelled wetlands (DELWP, 2022b)
* Expert opinion from senior flora ecologists within the consulting team

##### Step 3: Undertake a preliminary assessment of the remaining threatened ecological communities to determine which ones may be impacted directly, indirectly, or cumulatively and will therefore require further detailed assessment in the report

A preliminary assessment was undertaken for the TECs that remained following step 2. The purpose of the preliminary assessment was to determine which matters *may be* impacted directly, indirectly or cumulatively, where the definition for ‘may be’has been adapted from the *EPBC Act Significant Impact Guidelines 1.1* (DoE, 2013)to be ‘where there is a real or not remote chance or possibility’ of an impact on the species.

The preliminary assessment identified areas known to, or with the potential to support TECS which may be at risk of potential impacts under the Plan. For the Growth Areas, this was informed by targeted surveys by (EHP, 2021)). For the Strategic Assessment Area and broader Study Area, the distribution and characteristics of TECs identified in Step 2 were considered to inform an assessment of the likelihood of a direct, indirect, or cumulative impact occurring.

The TECs which were identified for further detailed assessment following application of the above methodology were assigned to Category 1. All TECs which were identified to not require further detailed assessment were assigned to Category 2.

#### ecological communities on the FPAL list

For FPAL communities, an initial review of the FPAL list was undertaken to identify FPAL communities which occur within Victoria. All FPAL communities which do not occur within Victoria were excluded from further assessment.

FPAL communities were then reviewed with regards to their potential distribution, to determine whether the community could occur within the Study Area. Where the community could not occur within the Study Area, it was excluded from further assessment.

A preliminary assessment of FPAL communities which have potential to occur within the Study Area was then completed. Communities which had potential to be directly, indirectly or cumulatively impacted were assigned to Category 1 for further assessment. Where impacts were considered unlikely, the community was assigned to Category 2.

### Migratory species

#### Data used to assess species presence and abundance

Migratory species present within the Study Area were identified by:

* Running a protected matters search using the Protected Matters Search Tool (PMST) for the Strategic Assessment Area with a buffer of 20 km to generate a report that identifies migratory species which are known to be, or have the potential to be, present in the Study Area
* Conducting a search of the Victorian Biodiversity Atlas (VBA) for known records of migratory species within the Study Area

The VBA records for the Study Area were downloaded in June 2022.

#### Categorisation method for migratory species

The categorisation methodology for migratory species was applied in a series of broad steps:

1. Application of guidance from the EPBC Act Significant Impact Guidelines 1.1, which identify key concepts (‘ecologically significant proportion’ and ‘important habitat’) used in the categorisation of migratory species. To assess the presence of an ecologically significant proportion of a species’ population, the entire Study Area was considered as a single location for each species
2. Where either an ecologically significant proportion of a species or important habitat may be available within the Study Area, conduct an assessment to determine whether the Plan has potential to impact upon the species or its habitat
3. Assign the species to Category 1 for further assessment if:
   * The species is also listed as a threatened species and is assigned to Category 1 as part of the threatened species categorisation process, OR
   * The following apply:
     + An ecologically significant proportion of a population of the species, or important habitat for the species, IS present within the Study Area, AND
     + There is potential for the Plan to impact the species or its habitat, based on the species’ occurrence within the Study Area and its ecological characteristics
4. Assign the species to Category 2 (no further assessment required) if:
   * An ecologically significant proportion of a population of the species, or important habitat for the species, is NOT present, OR
   * An ecologically significant proportion of a population of the species, or important habitat for the species IS present within the Study Area, but there is NO potential for the Plan to substantially impact the species or its habitat, based on the species’ occurrence within the Study Area and its ecological characteristics

Note that migratory species which are also threatened which are assigned to Category 1 based on the threatened species categorisation process are assessed as part of the threatened species assessment in Chapter 19.

#### Overview of guidance provided by the EPBC Significant Impact Guidelines 1.1

All migratory species were assessed in accordance with guidance provided by the EPBC Significant Impact Guidelines 1.1 (DoE, 2013). These guidelines identify two key components for assessing potential impacts to migratory species:

* Whether an ‘ecologically significant proportion’ of the species has potential to be impacted
* Whether ‘important habitat’ for the species has potential to be impacted

‘Ecologically significant proportion’ is defined in the Significant Impact Guidelines 1.1 as follows:

*“Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an ‘ecologically significant proportion’ of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species’ population status, genetic distinctiveness and species specific behavioural patterns (for example, site fidelity and dispersal rates).”* (DoE, 2013)

‘Important habitat’ is defined within the Significant Impact Guidelines 1.1 as:

1. *“habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or*
2. *habitat that is of critical importance to the species at particular life-cycle stages, and/or*
3. *habitat utilised by a migratory species which is at the limit of the species range, and/or*
4. *habitat within an area where the species is declining”* (DoE, 2013)

#### Identifying ecologically significant proportions and important habitat for migratory bird species

There is a range of different guidance available for migratory bird species with regards to the identification of ecologically significant proportions of the species and important habitat. Broadly, migratory bird species listed under the EPBC Act can be divided into three sub-groups:

* Migratory shorebird species which are included within the *EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (DoE, 2017)
* Migratory bird species which are included within the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (Migratory Bird Referral Guidelines) (DoE, 2015)
* Other EPBC Act listed migratory bird species which are not included within EPBC policy documents

The approaches which have been used to identify ecologically significant proportions of a species’ population and important habitat vary depending on which sub-group the listed migratory bird species belongs to. Each approach is outlined below.

##### Migratory shorebirds included within EPBC Act Policy Statement 3.21

###### Identification of an ecologically significant proportion of the species

The EPBC Act Policy Statement 3.21 states that wetland habitat is considered internationally important if it regularly supports 1 per cent of the individuals in a population of one species or subspecies of waterbird, and nationally important if it regularly supports 0.1 per cent of the flyway population of a single species of migratory shorebird (DoE, 2017).

A supporting document to the EPBC Act Policy Statement 3.21, *Revision of the East Asian-Australasian Flyway Population Estimates for 37 listed Migratory Shorebird Species,* provides the estimated total population, 1 per cent and 0.1 per cent thresholds for migratory shorebirds (Hansen *et al.*, 2016).

The policy statement also defines the term ‘support’ for permanent wetlands as follows: migratory shorebirds are recorded during surveys and/or known to have occurred within the area during the previous five years (DoE, 2017).

For the purposes of categorisation, a species included within the EPBC Act Policy Statement 3.21 was considered to meet the threshold of an ecologically significant proportion of the species if 0.1 per cent of the flyway population of a single species had been recorded within the Study Area during the previous five years (January 2017 - June 2022).

###### Identification of important habitat

Birdlife Australia has mapped all areas of important habitat for the 37 listed migratory shorebirds included in the EPBC Policy Statement 3.21 across Australia (Weller *et al.*, 2020).

These maps have been used to identify the locations of important habitat for migratory shorebird species within the Study Area.

##### Migratory birds included within the draft referral guidelines for 14 birds listed as migratory species under the EPBC Act

###### Identification of an ecologically significant proportion of the species

The Migratory Bird Referral Guidelines also defines 1 per cent of the total population of a migratory species to be an internationally important number of individuals, and 0.1 per cent of the total population of a species to be a nationally important number of individuals. The Referral Guidelines include the 1 per cent and 0.1 per cent thresholds for species covered by these guidelines (DoE, 2015).

The Migratory Bird Referral Guidelines do not provide guidance on the time frame over which species’ records should be considered when determining whether an ecologically significant proportion of the species is present at a site (DoE, 2015).

For the purposes of categorisation, a species included within the Migratory Bird Referral Guidelines was considered to meet the threshold of an ecologically significant proportion of the species if 0.1 per cent of the population of a single species had been recorded within the Study Area. No date threshold was applied to records in this analysis.

###### Identification of important habitat

The Migratory Bird Referral Guidelines provide broad descriptions of habitat characteristics which have potential to constitute important habitat (DoE, 2015). However, the broad nature of these descriptions is such that mapping of important habitat based on these descriptions is not possible.

Therefore, for the purposes of this assessment, the presence of important habitat was identified through considering:

* Whether there are habitat characteristics within the Study Area which meet the broad descriptions of important habitat provided within the Migratory Bird Referral Guidelines
* Whether an ecologically significant proportion of the species has been recorded to occur within the Study Area

This method takes into consideration the broad important habitat descriptions provided in the Referral Guidelines, while providing context with species’ records to determine whether the habitat within the Study Area is being used by the species.

##### Other migratory birds which do not have specific policy advice

###### Identification of an ecologically significant proportion of the species

There is a lack of guidance regarding the definition of an ecologically significant proportion of remaining bird species which do not have specific EPBC policy advice. However, it is noted that both the EPBC Act Policy Statement 3.21 and the Migratory Bird Referral Guidelines consider 0.1 per cent of the total population of a species to be a threshold of national importance (DoE, 2015, 2017).

Subsequently, for the purpose of categorisation, a species which does not have specific policy advice was considered to meet the threshold of an ecologically significant proportion of the species if 0.1 per cent of the population of a single species had been recorded within the Study Area. No date threshold was applied to records in this analysis.

Information regarding the estimated total population size for migratory birds within this category was sourced from Birdlife International’s Datazone database (Birdlife International, 2022), or from relevant species-specific information where available (such as Conservation Advices or Recovery Plans).

###### Identification of important habitat

While there is a lack of general guidance regarding the definition of important habitat for the remaining species without specific EPBC policy advice, there is a range of information available which has been used to identify and consider the characteristics of habitat which are likely to be important to these species.

For instance, a number of migratory species within this category are also listed as threatened under the EPBC Act. Where this was the case, other EPBC related resources (such as the species’ SPRAT profile, Conservation Advice and/or Recovery Plan where relevant) were considered with regards to the identification of potentially important habitat features for the species. Otherwise, information regarding habitat use and potentially important habitat features for migratory species in this category was sourced from Birdlife International’s Datazone database (Birdlife International, 2022).

For the purposes of this assessment, the presence of important habitat was identified through considering:

* Whether there are habitat characteristics within the Study Area which meet descriptions of potentially important habitat features identified through the methods described above
* Whether an ecologically significant proportion of the species has been recorded to occur within the Study Area

This method takes into consideration the presence of suitable habitat features, while providing context with species’ records to determine whether the habitat within the Study Area is being used by the species.

#### Identifying ecologically significant proportions and important habitat for other migratory species

All other migratory species were considered on a species-by-species basis drawing on guidance from the Significant Impact Guidelines 1.1 (DoE, 2013) and relevant species information.

###### Identification of an ecologically significant proportion of the species

Relevant species information to determine ecologically significant proportions of a species’ population was drawn from a range of sources. Examples include species’ Recovery Plans, Conservation Advices, Marine Bioregional Plans, and the species’ SPRAT profile.

Given the diversity of sources used, information available and ecological differences between species within this grouping (e.g., whales vs. turtles), no single threshold has been developed or applied to identify ecologically significant proportions of species within this category.

Instead, available records within the Study Area from the VBA were considered and assessed with regards to individual species’ ecology to determine whether a species which occurs within the Study Area could be meeting an ecologically significant proportion of that species’ population.

###### Identification of important habitat

Identification of important habitat for species within this category was also determined through individual consideration of available information regarding each species’ ecology and habitat use.

For the purposes of this assessment, the presence of important habitat was identified through considering:

* Whether there is habitat within the Study Area which could constitute important habitat for the species
* Whether an ecologically significant proportion of the species has been recorded to occur within the Study Area

This method takes into consideration the presence of suitable habitat features, while providing context with species’ records to determine whether the habitat within the Study Area is being used by the species.

### Ramsar wetlands

The identification of Ramsar wetlands potentially relevant to the Plan was identified by running a protected matters search using the Protected Matters Search Tool (PMST) for the Strategic Assessment Area with a buffer of 20 km to generate a report that identifies MNES, and other matters protected by the EPBC Act which are known to be, or have the potential to be, present in the Study Area.

The risk of impacts to Ramsar wetlands was considered based on the location of the wetland and its susceptibility to impacts. Where there was a risk of potential impacts, the matter was assigned to Category 1.

### Commonwealth land

Commonwealth land within the Study Area was identified using the Protected Matters Search Tool (PMST) for the Strategic Assessment Area with a buffer of 20 km. An assessment of the potential for development within the Growth Areas to adversely impact any sites was then undertaken to determine if they should be assigned to Category 1.

### World heritage properties, national heritage properties

The identification of World Heritage properties and National Heritage places potentially relevant to the Plan was undertaken by running a protected matters search using the Protected Matters Search Tool (PMST) for the Strategic Assessment Area with a buffer of 20 km to generate a report that identifies MNES, and other matters protected by the EPBC Act which are known to be, or have the potential to be, present in the Study Area. An assessment of the potential for development within the Growth Areas to adversely impact any sites was then undertaken to determine if they should be assigned to Category 1.

# Data used in the assessments for relevant protected matters

## Introduction

This chapter provides an overview of the key data sources used in the detailed assessments for relevant protected matters, and the use and interpretation of these sources.

The relevant items in the ToR relating to the use of data in the assessment are outlined in the following text box:

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| --- |
| *4.2. The Report must describe and provide justification for the method used to assess likely impacts on all protected matters arising from actions proposed to be taken under the Plan. The method must:*  *a) be appropriate for assessment at a strategic scale*  *b) rely on the best available information*  *c) discuss uncertainty, including reference to the data and information relied upon*  *4.8. The Report must include justification for key methods used in the assessment*  *4.9. The Report must include or refer to data from ecological surveys*  *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:*  *a) knowledge gaps in scientific understanding and responding to new knowledge*  *e) differences in survey results relating to MNES and how to evaluate and resolve discrepancies*  *9.1. The Report must identify the sources of information and data relied upon including the reliability and currency of the data.* |

## Key data sources

A number of data sources were used in the assessment, including:

* Ecological surveys by Ecology and Heritage Partners across large parts of the Growth Areas (EHP, 2021)
* Individual surveys undertaken by some landholders within the Growth Areas
* Site observations as part of the strategic assessment process
* Species records obtained largely through the Victorian Biodiversity Atlas (VBA) (DELWP, 2022a)
* DELWP habitat and vegetation modelling (DELWP, 2005, 2017)
* Key EPBC, State and local policy or regulatory documents
* Other information sources, including scientific literature and other spatial landscape data

An overview of these data sources is provided in Sections 13.2.1 to 13.2.7. Table 13‑1 provides a summary of the spatial data sources used in the assessment.

### Ecological surveys by ecology and heritage partners

The City commissioned Ecology and Heritage Partners (EHP) to undertake detailed ecological surveys within the Growth Areas. The surveys aimed to identify and map the presence of State and Commonwealth listed threatened species, ecological communities, and native vegetation to inform the Part 10 Strategic Assessment for the Growth Areas.

Field surveys were undertaken between November 2019 and December 2020. The methods and results of these surveys are described in ‘*Existing Ecological Conditions: Northern and Western Geelong Growth Areas*’ (refer to [this link](https://www.geelongaustralia.com.au/common/public/documents/8da9a307c3b6750-northernandwesterngeelonggrowthareas-strategicimpactassessmentdataset-august2022.PDF) for the EHP report) (EHP, 2021).

Two-hundred-person days were spent surveying the Growth Areas. Surveys were limited to parcels/properties where access was permitted, which totalled an area of over 2,075.3 ha, or just over 72 percent of the Growth Areas. Around 33 per cent of the NGGA and 13.2 per cent of the WGGA were not subject to site surveys due to a lack of access (see [Map 7-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_7_Report_Maps.pdf)).

Botanists (who were accredited by DELWP in the habitat hectare methodology) undertook detailed ecological assessments to quantify the extent and quality of native vegetation values in the growth areas (EHP, 2021).

Qualified flora and fauna ecologists undertook targeted surveys for the following Commonwealth listed threated flora and fauna species and threatened ecological communities (TECs) (EHP, 2021):

* *Delma impar* (Striped Legless Lizard)
* *Dianella amoena* (Mated Flax-lily)
* *Galaxiella toourtkoourt* (Little Galaxias)
* *Glycine latrobeana* (Clover Glycine)
* *Lachnagrostis adamsonii* (Adamson’s Blown-grass)
* *Litoria raniformis* (Growling Grass Frog)
* *Pimelea spinescens* subsp. *spinescens* (Spiny Rice-flower)
* *Prototroctes maraena* (Australian Grayling)
* *Rutidosis leptorrhynchoides* (Button Wrinklewort)
* *Senecio macrocarpus* (Large-headed Fireweed)
* *Synemon plana* (Golden Sun Moth)
* Natural Temperate Grassland of the Victorian Volcanic Plain

Surveys were generally undertaken in accordance with the relevant State and Commonwealth guidelines for vegetation, TECs, and threatened species surveys (EHP, 2021). Any deviations from relevant guidelines, including an explanation and justification for the methods used, are detailed in the EHP (2021) report. The methods and report underwent a process of peer and regulator review as part of developing and finalising the findings.

### Landholder surveys

In January 2022, the City provided an opportunity for landholders that had their properties surveyed during the period of the EHP surveys to provide additional information for consideration in the Strategic Assessment. The purpose of this process was to collect additional information where landholders had concerns with mapping inaccuracies and/or assumptions.

The additional information was reviewed against a set of criteria to help inform and guide decisions on appropriate changes to the dataset. Changes were considered appropriate where any of the following occurred:

* Landowner surveys addressed the relevant guidelines and were undertaken in the same survey season as EHP 2021. This recognises that native grasslands are a dynamic system that display natural variation from season to season. It is noted EHP undertook Vegetation Quality Assessment (VQA) surveys between November 2019 and January 2020
* EHP has acknowledged they were in error
* Small scale refinements were needed to address mapping anomalies and inaccuracies (e.g., mapped native grassland over buildings or driveways)

There was ongoing consultation with DELWP on the submissions received, the criteria used and the type and nature of proposed changes to the EHP dataset.

Four separate surveys were commissioned by individual landholders within the NGGA as part of this process. Surveys mainly focussed on the mapping of native vegetation. Together, these surveys covered an area of approximately 55 per cent (around 1,170 ha) of the NGGA. One survey was commissioned within the WGGA, covering an area of approximately 38 ha (or approximately 5 per cent). Refer to [Map 13-2](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_13_Report_Maps.pdf) for the area of the Growth Areas which was subject to landholder surveys.

All surveys were undertaken by DELWP accredited botanists according to relevant guidelines. Most of the submissions documented changes in site conditions (including increased weed cover, unsuitable/ incompatible species, and altered land management practices) and/or seasonal variability. However, none of the surveys were carried out during the same season as the EHP surveys. As a result, it was not possible to make a valid comparison of the native grassland extent and condition for the purposes of amending the EHP dataset on that basis. Instead, the survey information provides a useful and relevant indication of the changes in extent and condition of the grasslands for the purposes of understanding ecological trend as part of the Strategic Assessment.

The process did lead to a number of more minor changes to the extent of mapped native vegetation and species habitat where the other two criteria were met as follows:

* EHP have acknowledged and field verified native vegetation mapping errors on the property at 450 Elcho Road, Lovely Banks. The dataset was updated to include the corrected mapping from EHP for this property. This sees a reduction in the native vegetation (approximately 22 ha), the removal of areas of mapped Natural Temperate Grassland (14.2 ha) and a reduction in the potential habitat for the Striped Legless Lizard (10.5 ha)
* Small scale refinements for the EHP dataset for:
  + 35 Staceys Road, Lovely Banks - the driveway was excluded from the native vegetation habitat zone (0.1 ha) and the driveway, outbuildings and house were removed from the Golden Sun Moth habitat (1.1 ha)
  + 435 Elcho Road, Lovely Banks - the dam, house and driveway were removed from the Golden Sun Moth habitat (0.3 ha)
  + 480 - 530 Heales Road, Lovely Banks - treed area removed from Golden Sun Moth habitat (0.41ha)
  + 460 Evans Road, Lovely Banks - house and treed area removed from Golden Sun Moth habitat (0.67ha)
  + 350 Elcho Road, Lovely Banks - treed areas removed from Golden Sun Moth habitat (5.83ha)

These changes led to a revised EHP dataset, which is the final EHP dataset referred to in this report and used as part of the baseline information for the assessment of impacts to MNES.

Refer to [this link](https://www.geelongaustralia.com.au/common/public/documents/8da9a307c3b6750-northernandwesterngeelonggrowthareas-strategicimpactassessmentdataset-august2022.PDF) for a summary of the Landholder Submission Review.

### Site observations by the Consulting Team

The Consulting Team (being the consultants commissioned by the City to undertake the Strategic Assessment) have visited the Growth Areas on a number of occasions to help inform the assessment process. These visits have included:

* Initial site visits to the Growth Areas in November 2021
* Site observations of the NGGA to inform the Structured Decision Making (SDM) process in March 2022
* A visit to the NGGA/WGGA with DCCEEW in August 2022

Refer to Attachment A of Part 3 for a summary of these visits and the key observations made.

#### Site visits in November 2021

The Consulting Team undertook an initial site inspection at the end of November 2021 of a number of properties within the NGGA and WGGA which could be observed via publicly accessible vantage points. The team were able to make a number of observations relating to condition and the influence of existing threats on the biodiversity values in the area.

Steve Mueck, a lead botanist from Biosis, and Mitchell Deaves, the Biosis project manager for the NWGGA strategic assessment, attended alongside staff from the City of Greater Geelong.

#### SDM site visit March 2022

The Consulting Team visited five properties within the NGGA in March 2022. The main purpose of this visit was to understand the condition and management potential of native vegetation within the NGGA. The site visit informed the costing and management requirements for grassland restoration in the NGGA, which was a key consideration in determining the extent and location of land to be avoided and managed within the NGGA.

Steve Mueck led the visits. Steve was supported on site by a grassland restoration and management expert, Peter Wlodarczyk.

#### Visit with DCCEEW in August 2022

The Consulting Team attended a site visit with DCCEEW to the Growth Areas in early August 2022. This visit provided an opportunity to view the future Conservation Area in the NGGA, as well as the biodiversity values and condition of a number of sites supporting MNES.

The Consulting Team attendees included Steve Mueck and Mitchell Deaves.

### Species records

Existing records of threatened species were obtained from the Victorian Biodiversity Atlas (VBA). The VBA is a web based database which manages information about species found in Victoria. Data is supplied to the VBA by a range of contributors including DELWP biodiversity staff, government agencies and partner organisations, non-government organisations, ecological consultants, university students, and community wildlife survey groups (DELWP, 2022a).

Submitted data is reviewed and verified by DELWP and other key partners. New records submitted to the VBA are subject to verification by an appropriate expert to review. The expert review process occurs over approximately 4 months, after which new records and spatial data sets are released (DELWP, 2022a).

The VBA provides the most comprehensive source of species records in Victoria.

These records were used to supplement survey records within the Growth Areas, and to contribute to an understanding of presence within the unsurveyed areas of the Growth Areas and the broader Study Area.

### DELWP models

Modelling produced by DELWP was used in the assessment report. This includes:

* Habitat importance models (HIMs) (DELWP, 2017)
* Modelled Ecological Vegetation Classes (EVCs) (DELWP, 2005)

#### Habitat Importance Models

DELWP have developed HIMs for many of the threatened species that occur within Victoria. These models (DELWP, 2018a):

* Collect and compare information on where a species has been recorded
* Relate that data to environmental variables to enable the potential distribution of a species’ habitat to be estimated and mapped
* Identify the areas of habitat that may be relatively more important to the species persistence than others

HIMs provide a useful planning tool for understanding the potentially important areas of a species’ habitat distribution across the landscape. The models indicate the relative importance of habitat areas from low through to high.

#### Modelled Ecological Vegetation Classes

Modelled EVCs were used to inform the potential occurrence of native vegetation and TECs where survey data was unavailable. The Modelled 2005 Ecological Vegetation Classes data set combines the pre 1750 EVC modelling and the current version of modelled Native Vegetation Extent to assign EVCs and conservation status to the current native vegetation modelling (DELWP, 2005).

This data set is prepared and managed by DELWP. It is used for the implementation of the Native Vegetation Management Framework, preparation of Regional Vegetation Plans and a number of other biodiversity planning purposes (DELWP, 2005).

### Key EPBC, state and local policy or regulatory docs

The main EPBC, State and local policy or regulatory documents used to inform the assessment included:

* Commonwealth listed threatened species Recovery Plans and Conservation Advices
* Commonwealth Threat Abatement Plans
* Corangamite Regional Catchment Strategy 2021 – 2027 (CCMA, 2021)
* Corangamite Waterway Strategy 2014-2022 (CCMA, 2014)
* EPBC policy statements and guidelines
* State listed threatened species action statements
* State Wide Integrated Flora and Fauna Teams threatened species profiles (SWIFFT, 2022)
* The Northern And Western Geelong Growth Areas Framework Plan (The City of Greater Geelong, 2021)
* The Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site Ecological Character Description (DELWP, 2020)
* The Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Information Sheet (RIS) (Parks Victoria, 1999)
* The Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site Management Plan (DELWP, 2018b)
* The Greater Geelong Planning Scheme (The City of Greater Geelong, 2022)

### Other information sources

A number of additional information sources and data sets were used in the assessment report, including:

* Peer reviewed scientific literature
* Data sets on biodiversity values, including:
  + Land management data sets (Public land, CMA)
  + Hydrology data sets (Ramsar sites, hydrolines and waterbodies)
* Expert knowledge of ecological consultants

Table 13‑1: Data sets used in the Assessment Report

| **Data set theme** | **Data set name** | **Date** | **Custodian** | **Details** | **Use on project** |
| --- | --- | --- | --- | --- | --- |
| Drainage and water bodies | Ramsar Wetland Areas in Victoria at 1:25 000 | 2022 | DELWP | Data layer which defines RAMSAR wetland areas in Victoria | Used to identify protected wetlands under the RAMSAR Convention in the Study Area |
| CMA100 TAB | 2022 | DELWP | Data layer which defines the Catchment Management Authority boundaries | Used to identify catchments within the Study Area |
| Catchments | 2016 | The City | Data layer which defines catchments within the LGA | Used to identify catchments within the Study Area |
| Protected lands and conservation planning | Collaborative Australian Protected Areas Database (CAPAD) 2020 - Terrestrial | 2021 | DCCEEW | The CAPAD database provides spatial and textual information about government, Indigenous and privately protected areas in marine and terrestrial environments | Used to identify protected areas within the Study Area |
| Public Land Management (PLM25) | 2022 | DELWP | Data layer which describes public land management across VIC, including State forests, parks and reserved and unreserved Crown Land | Used to identify protected areas within the Study Area |
| Species sightings and habitat | Species site survey records and mapping | 2020 | Ecology and Heritage Partners | Mapped habitat and records for species subject to targeted surveys during site surveys | Used in the detailed impact assessments for species where data is available |
| Victorian Biodiversity Atlas (VBA) | 2022 | Department of Environment, Land, Water and Planning (DELWP) | Fauna and flora sightings records stored in the Victorian Biodiversity Atlas | Used to:   * Determine whether a species requires consideration in the categorisation process * Assess the impacts to species during detailed impact assessments |
| Habitat Importance Model’s (HIM’s) | 2017 | Department of Environment, Land, Water and Planning (DELWP) | These spatial layers estimate the relative importance of modelled species habitat | Used in the detailed impact assessments |
| Vegetation mapping | Vegetation and TEC site survey mapping | 2020 | Ecology and Heritage Partners | Vegetation and TEC mapping from site surveys | Used in the detailed impact assessment of TECs |
| Modelled 2005 Ecological Vegetation Classes (with Bioregional Conservation Status | 2005 | DELWP | Data layer which presents the modelled EVCs occurring across Victoria | Used to inform potential occurrence of native vegetation and TECs in the absence of survey data |

## Use and interpretation of data

The sources of data and information outlined in Section 13.2 were used to inform the impact assessment at three levels:

* Within the surveyed areas of the Growth Areas
* Within the unsurveyed areas of the Growth Areas
* Within the Strategic Assessment Area and across the broader Study Area

Data has been used and interpreted differently for each of these areas. The suitability of the approach to using and interpretating the data for use in the assessment is influenced by the quality of the datasets (relating to factors such as accuracy, coverage, currency, and reliability) as well as the nature and intensity of potential impacts on protected matters.

The use of data at each of these levels is discussed below. This discussion provides:

* An overview of the general approach to the use and interpretation of data for the assessment. The focus here is on the key data sources used to understand and map the location, extent, importance and condition of habitat or occurrences of relevant protected matters. This forms the *baseline dataset* for the impact assessment on each protected matter
* Identification of any risks, uncertainties, or gaps in the data and how these are being addressed
* An evaluation of the appropriateness of the approach for assessment at a strategic scale

A detailed outline of the data and methods used to produce the specific baseline maps for each protected matter is provided in the respective impact assessment chapters in Part 4 of this report.

### Within the surveyed areas of the growth areas

As outlined above, EHP were able to survey approximately 66 per cent of land across the two Growth Areas. The baseline dataset used to assess potential impacts to MNES within these surveyed areas has been developed largely using:

* The results of the EHP surveys (EHP, 2021)
* Historical species records (DELWP, 2022a)
* The results of other landholder surveys
* Site observations made by the consulting team during the Strategic Assessment

#### Use and interpretation of EHP survey results and historical records

The results of the EHP surveys, as well as other historical records, were used to identify the threatened species and communities that occur within the Growth Areas. The results of the surveys informed habitat mapping within the surveyed areas for threatened species and threatened ecological communities that were recorded within the Growth Areas. The targeted surveys also identified the absence of a number of MNES within potential habitat areas of the Growth Areas.

EHP’s survey results and description of the environmental condition and habitat characteristics across the Growth Areas were used to identify the key attributes relevant to the EPBC assessments, including the presence of habitat critical to survival or important populations.

#### Use and interpretation of landholder surveys and site visit observations

The landholder surveys provide a useful indication of the changes in extent and condition of grasslands within parts of the Growth Areas between survey seasons. This is relevant to help understand ecological trend as part of the Strategic Assessment. The extent of weeds and general trends observed in vegetation condition were confirmed by the Consulting Team during site visits. This information was integrated into the approach for mapping habitat for specific species, as relevant to their individual ecology.

#### Suitability of data approach to surveyed areas of the Growth Areas

The suite of information available to understand the MNES values within the surveyed areas of the Growth Areas provides a high level of detail, resolution, and confidence for the assessment. The information is:

* Reliable and accurate, having been developed according to relevant guidelines by suitably qualified ecologists
* Current and best available, taking account of all available information in a robust way

This is both necessary and appropriate given this information has been used in the assessment to:

* Determine the most suitable areas for retention, protection, and management. These decisions need to be supported by the best available data to provide certainty around the conservation outcomes that can be delivered and inform planning in terms of management actions and costs
* Understand the scale and importance of impacts. The areas within the surveyed areas of the Growth Areas that will not be retained will be cleared for development. This is the largest area of land under the Plan that will be subject to direct impacts, which will be both permanent and irreversible. Well defined and reliable data is critical to support an assessment of the significance of these impacts, and subsequently inform the need for, type and quantum of any offsets

### Within unsurveyed areas of the growth areas

As outlined above, around 33 per cent and 13.2 per cent of the NGGA and WGGA respectively were not subject to site surveys (see [Map 13-1](https://www.geelongaustralia.com.au/common/public/documents/agenda-maps/Chapter_13_Report_Maps.pdf)). The properties which were not accessed within the Growth Areas comprise many small, rural residential landholdings which are fragmented by windrows/landscaping and have a much higher proportion of land use for dwellings and driveways compared to the broader Growth Areas. The environment within these unsurveyed areas tends to be more modified or degraded as a result.

The baseline dataset used to assess potential impacts within these unsurveyed areas has been developed using:

* Over-the-fence observations by:
  + EHP during the time of their surveys (EHP, 2021)
  + The consulting team during site visits
* DELWP HIMs (DELWP, 2017)
* DELWP EVC modelling (DELWP, 2005)
* Historical species records (DELWP, 2022a)

#### Use and interpretation of observations from EHP and the consulting team

EHP were able to undertake visual assessments of some of these unsurveyed areas where they could be viewed over the fence, such as from reserves, roadsides, and adjacent properties. EHP made the following general observations in their report that are relevant to understanding the potential MNES values within the unsurveyed areas (EHP, 2021):

* The majority of the Growth Areas are highly modified due to historical and ongoing agricultural and farming practices, and are dominated mostly by non-indigenous grasses and weeds
* The majority of parcels that were not surveyed comprise small, rural residential landholdings which tend to be more modified or degraded compared to the broader Growth Areas
* These unsurveyed areas may still support remnants of suitable habitat consistent with those already confirmed within the NGGA and WGGA

A similar set of observations were made by the consulting team during the July 2022 site visit.

Based on these observations, the assessment has assumed that:

* The unsurveyed areas provide potential habitat for all of the MNES identified within the respective areas of the surveyed areas
* The scale or extent of potential habitat is broadly commensurate with the extent mapped within the surveyed areas

#### Use and interpretation of DELWP models

DELWP’s HIM and EVC models (DELWP, 2005, 2017) were used to map the potential presence of habitat for species and communities within the unsurveyed areas, where those MNES had been confirmed by EHP to occur within the surveyed areas.

For each MNES, a comparison of the extent predicted to occur within the surveyed areas using the DELWP models was made against the actual extent confirmed by EHP. This allowed a factor to be identified and applied as necessary to the models to arrive at an extent of potential habitat for the unsurveyed areas that is broadly equivalent to that confirmed within the surveyed areas. The full extent of the HIMs was used for the assessment (i.e., no thresholds relating to importance were applied).

#### Suitability of data approach to unsurveyed areas of the Growth Areas

The approach to baseline mapping within the unsurveyed areas of the Growth Areas is considered to:

* Appropriately reflect the potential MNES that may occur based on the observations and expert opinions of a number of ecologists
* Be suitably conservative for the purposes of this assessment as:
  + The higher intensity land use associated with the smaller, rural residential landholdings across the unsurveyed areas compared with the surveyed areas means that the habitat attributes or condition needed to support the species or communities are less likely to be retained in these areas. Basing the extent of potential habitat in these areas on the equivalent extent in the surveyed areas is therefore more likely to over-predict, rather than under-predict, potential habitat. This is an appropriate way to address any residual uncertainty that arises from a lack of targeted surveys
  + The full extent of the HIMs were used in the assessment. As a result, even areas with lower levels of relative importance to the species were considered

This information will be used in the assessment to understand the potential scale of habitat for the purposes of calculating direct impacts and an associated offset liability. The approach is considered to adequately manage risks to MNES given the current land use and condition of the unsurveyed areas substantially minimises the likelihood that these areas support an important area for MNES.

### Outside the Growth Areas

The assessment of potential impacts under the Plan needs to address:

* The impacts that could occur as a result of external infrastructure development outside of the Growth Areas and within the Strategic Assessment Area
* The potential indirect impacts of development within the Growth Areas on protected matters outside of the Growth Areas

The baseline information used to assess potential impacts in these areas is discussed in the following sections.

#### External infrastructure development

The Plan allows for infrastructure development *outside* of the Growth Areas but within the SAA (referred to as ‘external infrastructure’). This external infrastructure will occur according to a specified scope within a defined footprint under the Plan.

There is potential for this footprint to support small areas of habitat for MNES. Ecological surveys are yet to occur within these areas and there have been no field observations of these areas to support the assessment. The key baseline data sources used to understand potential presence of MNES for the assessment of these areas includes:

* DELWP HIMs (DELWP, 2017)
* DELWP modelled EVCs (DELWP, 2005)
* Historical records (DELWP, 2022a)

This data provides a high-level indication of potential occurrence within the external infrastructure footprints. Further information will be required to inform detailed planning and design of the relevant infrastructure projects to ensure that the potential risks to MNES are adequately addressed and that potential impacts and outcomes are appropriate. To this end, the Plan includes a number of Commitments and Measures relating to survey, design and avoidance. These include:

* A Commitment (13) to design and locate external infrastructure to avoid impacts to protected matters, along with a set of specific avoidance prescriptions relating to particular MNES that may be affected
* A Measure to undertake targeted surveys within the external infrastructure footprints for all protected matters with the potential to occur. Surveys must be undertaken prior to development to inform the detailed planning and design phase of each infrastructure project, and in accordance with relevant survey guidelines or standards
* A series of measures to report, monitor and manage avoidance outcomes against the Commitment

#### Assessment of indirect impacts on protected matters outside of the Growth Areas

Development that occurs within the Growth Areas has the potential to impact protected matters outside of the Growth Areas in an indirect way. For instance, through impacts that may be operating at the interface of development and non-development areas, or through downstream pathways associated with waterways.

A Study Area has been defined for the purposes of the assessment as: the Strategic Assessment Area with a 20 km buffer. This buffer captures the key values associated with protected matters that occur downstream of the Growth Areas (such as Ramsar wetlands) and is considered to be conservative in identifying the spatial reach of any potential indirect impacts of development.

The baseline information used to inform the assessment of potential indirect impacts within the Study Area includes:

* DELWP HIMs (DELWP, 2017)
* DELWP modelled EVCs (DELWP, 2005)
* Historical records (DELWP, 2022a)

The data set provides a good indication of potential presence and relative importance of areas to MNES across the broader Study Area. It provides sufficient detail to understand the context and relationship of key MNES areas to the Growth Areas to support an assessment of potential indirect impacts.

# Addressing uncertainty and risk

The ToR requires the assessment report to identify key uncertainties and risks associated with implementing the Plan, and identify:

* Responses to those uncertainties and risks
* Proposed adaptations to changing circumstances

The relevant ToR are:

|  |
| --- |
| *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:*  *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.* |

The following section provides an analysis of how the Plan addresses the key risks and uncertainties. The analysis is supported by the detailed evaluation of the Plan in Part 5.

Note that ToR 6.1(e) (which relates to differences in survey results relating to MNES and the evaluation and resolution of discrepancies) is addressed in Chapter 13 of Part 3.

## Knowledge gaps in scientific understanding and responding to new knowledge

### Knowledge gaps in scientific understanding

There are two key types of gaps in scientific understanding relevant to the assessment:

* Data gaps
* Gaps in understanding of ecological processes (for example, the particular ecology of a threatened species)

#### Data gaps

Data gaps for this assessment can be defined as a lack of information about a particular element of the environment. For example, presence or absence information for a threatened species at a particular site may not be available at the time required.

Given the large spatial scale of the Plan, it is not possible to have perfect information about the environment and some level of uncertainty in data is inherent in the project. As outlined in Chapter 13 of Part 3, a comprehensive data set has been collected for the assessment which addresses the ToR and is considered appropriate for the assessment.

The data that has been used in the assessment and any limitations are discussed in detail in:

* Chapter 13: Data used in the assessment
* Individual assessment chapters for protected matters

The main areas of data uncertainty relate to the areas within the development footprint that will be subject to direct impacts where no targeted surveys have been undertaken. These include:

* The unsurveyed areas within the Growth Areas, relating to 694.5 ha or 33 per cent in the NGGA and 101.2 ha or 13.2 per cent in the WGGA
* The external infrastructure footprints

As described in Chapter 13 of Part 3, approaches have been developed to address these gaps to sufficiently manage risks to MNES. These approaches involve:

* The use of assessment methods that are conservative or precautionary where uncertainty exists around the scale of potential impacts
* The use of Commitments and Measures under the Plan to address data gaps during implementation and provide for clear and appropriate outcomes for MNES

#### Understanding of ecological processes

Sufficient understanding of ecological processes is a key challenge for all environmental impact assessments. There is commonly a lack of information about issues such as:

* Species distribution
* Species habitat requirements
* Species population numbers and dynamics
* The effects of key threatening processes (e.g., climate change)
* The best approaches for minimising and mitigating potential impacts

The assessment addresses these uncertainties through:

* Gathering the best available information from scientific literature, expert knowledge, on-ground surveys
* The use of Commitments and Measures under the Plan to generate the technical information needed to address information gaps and inform planning and development in a way that adequately protects MNES
* Applying a precautionary approach to understanding and evaluating potential impacts. An analysis of the application of the precautionary principle is provided in Part 5

The Plan addresses uncertainty through its monitoring, evaluation, reporting and improvement (MERI) framework combined with ongoing adaptive management. This is discussed below in Section 14.5.

### Responding to new knowledge

Given the long timeframe of the Plan, new knowledge about environmental issues will become available through:

* New scientific research
* Monitoring as part of implementation of the Plan

It will be critical that the Plan can consider this information and respond appropriately. The Plan’s approach to this is discussed below in Section 14.5.

## Assumptions made in assessing potential impacts and benefits

One of the key risks in environmental impact assessment is making incorrect assumptions about the nature of potential impacts and benefits of a project. In particular, it is important that the consequences of potential impacts are not understated, and the benefits of conservation measures are not overstated.

To address this risk, the assessment report takes a precautionary approach to identifying and analysing impacts and benefits. Two examples of this include:

* The assumption that all MNES values within the areas subject to development will be lost due to a lack of certainty around the additional biodiversity outcomes that will delivered in accordance with the BCS during precinct planning
* The habitat mapping for threatened species within unsurveyed areas of the Growth Areas generally overestimates the amount of habitat which means the impacts that are assessed are likely to be larger than what will ultimately occur on the ground.

The assumptions made in assessing potential impacts and benefits are:

* Outlined in Part 3 – Assessment Approach which describes the methods used in the assessment
* Set out in relation to each protected matter in the individual assessment chapters

The application of the precautionary principle to the assessment is evaluated in Part 5.

## How changes to State and Commonwealth legislation, policies, plans and advice is to be accounted for in the management of the areas impacted by the Plan

Given the long timeframes of the Plan, changes to legislation, policies, plans, and advice are inevitable. These changes may lead to risks around:

* Implementation processes. For example, changes to State planning policies may affect the approaches to addressing indirect impacts
* Conservation priorities for threatened species and ecological communities. For example, changes to a Conservation Advice may provide new information about the key threats to a species and the recommended mitigation strategies
* Compliance. For example, changes to legislation may have implications for compliance under what would then be an approval under outdated legislation

The Plan addresses these risks through:

* Clearly establishing outcomes and commitments that will be delivered despite any changes to legislation, policies, plans and advice
* The use of specific commitments that have been developed to account for potential changes
* Its approach to MERI and adaptive management (discussed in Section 14.5 below) which will provide a way of responding to any changes to legislation, policies, plans and advice

## Capacity to ensure the Plan is implemented

Effective implementation is particularly important for strategic assessments because of the size and complexity of the programs, the long timeframes over which they are implemented, the number of stakeholders and the diversity of their interests, the amount of money the programs cost, and the complexity of the legal frameworks they operate within.

Lessons learnt from other strategic assessments around Australia suggest that effective implementation requires:

* Clear and feasible outcomes that the Plan will deliver
* Clarity about the delivery framework and mechanisms to implement the Plan
* Appropriate flexibility within the Plan to ensure it remains relevant over time
* Clear governance arrangements, including certain funding
* Comprehensive processes to monitor and report on implementation, and adapt implementation as needed
* Simplification of Plan documentation
* Publication of progress against commitments and measures

The Plan has been designed to address these issues. A detailed evaluation of the ability of the Plan to be implemented is provided in Section 29.6 of Part 5.

## Adaptive management under the Plan

Adaptive management is a process for improving management practices through learning from the outcomes of previous management (DSEWPC, 2011). It is based on information derived from monitoring and can be applied anywhere uncertainty in management exists.

Adaptive management involves the following steps: monitoring, evaluation, reporting and improvement (referred to as a MERI framework). Each of these steps is applied iteratively over the life of a project to ensure that the project is effective in delivering its objectives over time.

Adaptive management is an essential part of the implementation framework for strategic assessments. It is important because:

* The scale and complexity of strategic assessments means that there may be uncertainty relating to some impacts during the assessment process that need to be addressed during implementation
* The timeframes for strategic assessments are long and implementing agreed outcomes will be subject to a range of uncertainties over the life of the Plan
* Factors relating to the environment are likely to change over the life of a strategic assessment and an adaptive approach to management will be important for achieving the Plan’s outcomes
* Changes to State and Commonwealth legislation, policies, plans and advice will occur over the life of the Plan

Providing a process to address uncertainty and deal with changing circumstances during the life of the Plan is therefore critical.

The Plan’s approach to adaptive management is provided in the MERI framework which is described in Chapter 7.5 of the Plan. The specific measures to implement the MERI framework including adaptive management are detailed in the Commitments and Measures document.

An evaluation of the adequacy of the Plan’s approach to adaptive management is provided in Part 5 of the SAR.

References

Birdlife International (2022) *BirdLife Data Zone*. Available at: http://datazone.birdlife.org/species/search.

CCMA (2014) ‘Corangamite Waterway Strategy 2014-2024’. Corangamite CMA.

CCMA (2021) ‘Corangamite Regional Catchment Strategy’. Corangamite CMA.

DELWP (2005) ‘Native Vegetation - Modelled 2005 Ecological Vegetation Classes (with Bioregional Conservation Status)’. Department of Environment, Land, Water and Planning.

DELWP (2017) ‘Habitat Importance Models’. Department of Environment, Land, Water and Planning.

DELWP (2018a) ‘Habitat Distribution Models and Habitat Importance Models’. Department of Environment, Land, Water and Planning.

DELWP (2018b) ‘Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site Management Plan’. Department of Environment, Land, Water and Planning.

DELWP (2020) ‘Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site Ecological Character Description’. Department of Environment, Land, Water and Planning.

DELWP (2022a) ‘Victorian Biodiversity Atlas’. Department of Environment, Land, Water and Planning.

DELWP (2022b) ‘Victorian Wetland Inventory (Current)’.

DoE (2013) *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*. Canberra: Department of the Environment.

DoE (2015) ‘Draft Referral guideline for 14 birds listed as migratory species under the EPBC Act’. Department of Environment.

DoE (2017) ‘EPBC Act Policy Statement 3.21: Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species’. Department of Environment.

DSEWPC (2011) ‘A guide to undertaking strategic assessments’. Department of Sustainability, Environment, Water, Population and Communities.

EHP (2021) ‘Existing Ecological Conditions: Northern and Western Geelong Growth Areas’. Prepared for the City of Greater Geelong.

Hansen, B.D. *et al.* (2016) ‘Revision of the East Asian-Australasian Flyway Population Estimates for 37 listed Migratory Shorebird Species’. Unpublished report for the Department of the Environment. BirdLife Australia, Melbourne., p. 90.

Parks Victoria (1999) ‘Information Sheet on Ramsar Wetlands’. Parks Victoria.

SWIFFT (2022) *Threatened species profiles*. Available at: https://www.swifft.net.au/cb\_pages/threatened\_species\_profiles.php.

The City of Greater Geelong (2021) ‘The Northern and Western Geelong Growth Areas Framework Plan.’

The City of Greater Geelong (2022) ‘Greater Geelong Planning Scheme’. The City of Greater Geelong.

Weller, D. *et al.* (2020) ‘Australian National Directory of Important Migratory Shorebird Habitat’. Prepared for the Department of Agriculture, Water and the Environment by Birdlife Australia.



MAY 2023

DRAFT NWGGA STRATEGIC ASSESSMENT REPORT

PUBLIC EXHIBITION VERSION

PART 3: ASSESSMENT APPROACH

ATTACHMENT A - SUMMARY OF SITE VISITS TO THE GROWTH AREAS

PREPARED FOR THE CITY OF GREATER GEELONG

DOCUMENT TRACKING

|  |  |
| --- | --- |
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| **VERSION CONTROL:** | |
| VERSION: | Public exhibition version |
| DATE: | May 2023 |

1. Summary of site visits to the Growth Areas

The Consulting Team (being the consultants commissioned by the City to undertake the Strategic Assessment) have visited the Growth Areas on a number of occasions to help inform the assessment process. These visits have included:

* Initial site visits to the Growth Areas in November 2021
* Site observations of the NGGA to inform the Structured Decision Making (SDM) process in March 2022
* A visit to the NGGA/WGGA with DCCEEW in August 2022

Table 1 provides the date, attendees, purpose, and locations of these visits along with an overview of the key observations made by the Consulting Team.

Table 1: Summary of the three site visits to the Growth Areas

| **Date** | **Attendees** | **Purpose** | **Areas inspected** | **Key observation** |
| --- | --- | --- | --- | --- |
| 30/11/2021 | **The consulting team:**   * Mitch Deaves * Steve Mueck   **The City:**   * Jessica Cook * Jayden Holmes | Initial site inspection led by the City to understand the context of the NWGGA | Several locations within the NWGGA were observed from a distance via publicly accessible vantage points (i.e., road reserves). Vantage point locations included:   * WGGA: Avonlea Road, Evans Road, Geelong-Ballan Road, and Midland Highway * NGGA: Staceys Road, Elcho Road, Evans Road, Heales Road, Tower Hill Road | * Areas of native vegetation identified by EHP (EHP, 2021) are typically areas characterised by a small number of indigenous perennial grasses and a low diversity of native herbs. These marginal, degraded areas of remnant indigenous vegetation are subject to changes in condition depending on seasonal conditions where drought favours indigenous species and wet periods favour introduced pasture species * A number of areas previously identified as native vegetation in the WGGA were observed to have been under recent cultivation * The NGGA is currently being influenced by the invasion of Chilean Needle-grass (*Nassella neesiana*). This will likely disrupt the historical cycles of dominant ground cover species, which includes native perennial grasses. Chilean Needle-grass is a high threat perennial grass which once dominant, excludes all other species unless subject to targeted control. The apparent expansion in the dominance of Chilean Needle-grass has therefore permanently altered the landscape of parts of the NGGA (as local control measures are unlikely given the expense involved in removing this species) * Areas previously identified as native vegetation in the NGGA, while naturally waning during the current wet climatic cycle, appear to have been largely taken over by the invasion of Chilean Needle-grass. This situation is most likely more permanent than not, and any remnant native vegetation will be subject to ongoing deterioration as a result of this invasion * Native vegetation is unlikely to be present within most, if not all of the unassessed areas due to the intensity of land use within these areas |
| 21/3/2022 | **Biosis:**   * Steve Mueck * Mitch Deaves * Peter Wlodarczyk   **Newland:**   * Mark Whinfield * Brett Lane (Nature Advisory) | Request to visit landholdings to inspect native vegetation extent and condition  This site visit was used to inform the Structure decision making project | Newland landholdings, including:   * 295-335 Elcho Road * 345-395 Elcho Road * 500 Elcho Road * 460 Evans Road * 350 Emmersons Road | Similar observations to the November 2021 site visit above |
| 3/8/2022 | **Biosis:**   * Steve Mueck * Mitch Deaves   **The City:**   * Jessica Hurse * Alex Schmidt   **DCCEEW:**   * Mick Welsh   **Landholders:**   * Nick Clements (Tract), representing 135 Staceys Road * Chris Wheaton (Newland) – 75 Staceys Road | Visit to the growth areas with DCCEEW | Properties visited include:   * 135 Staceys Road * Cowies Creek * 775 Evans Road * 75 Staceys Road | * 135 Staceys Road – view of conservation land to observe some native vegetation and embedded rock * 775 Evans Road – SLL habitat – embedded rock viewed from roadside. Dominated by weeds * 75 Staceys Road (highest density of GSM records) – large areas of Chilean Needle-grass * 295 Elcho Road (example of Natural Temperate Grasslands of the Victorian Volcanic Plains) – this area was observed to be of low quality |

References

EHP (2021) ‘Existing Ecological Conditions: Northern and Western Geelong Growth Areas’. Prepared for the City of Greater Geelong.