

Fishermans Bend Water Sensitive City Strategy

May 2022



VICTORIA
State
Government

Jobs,
Precincts
and Regions

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Aboriginal Acknowledgement

We acknowledge the Traditional Owners of country throughout Victoria, their ongoing connection to this land and we pay our respects to their culture and their Elders past, present and future.





A thriving place that is
a leading example for
environmental sustainability,
liveability, connectivity, diversity
and innovation.

Executive summary

Fishermans Bend stretches from the doorstep of Melbourne's CBD to the mouth of the Yarra River and is Australia's largest urban renewal area. It offers an unparalleled opportunity to create a world leading, sustainable, mixed-use place to live, work, visit and invest.

Water has always played a significant role in Fishermans Bend history, from creation stories as a rich food source for Aboriginal people through to the effects of flooding in the low-lying areas affecting residents and businesses. Fishermans Bend faces significant challenges in the years ahead from climate change with stormwater, riverine and coastal flooding, coupled with Victoria's climate becoming drier and warmer, leading to water scarcity.

To ensure that Fishermans Bend addresses the current and projected impacts of climate change, a bold, collaborative water plan is required. To achieve this, a Water Sensitive City Strategy is proposed.

The *Fishermans Bend Framework* (adopted by Government in 2018) identifies eight Sustainability Goals that are underpinned by a series of Targets, Objectives and Strategies.

The Water Sensitive City Strategy builds on three overarching pillars; Flood Management, Climate Resilient Water System and Urban Ecology underpinned by water sensitive priorities to create a healthy, green environment that offers social, environmental and economic benefits.

The delivery of the Water Sensitive City Strategy for Fishermans Bend relies on a range of infrastructure interventions at various spatial scales across the public and private realm:

- Green roofs, green walls and rainwater tanks in the private realm work with distributed storages, raingardens and tree pits at the street scale to provide a multi-faceted approach to stormwater run-off management, urban cooling, biodiversity and amenity outcomes.
- A water recycling plant and third pipe network to deliver on water security.
- Traditional civil engineering infrastructure of pipes, pumps and levees to ensure protection from Yarra River overflows and flood management.

Planning provisions and detailed precinct plans will underpin the implementation of the Water Sensitive Strategy. Implementation of the Strategy will require coordination through a common framework, whilst being delivered and led by the responsible organisation. A Water Sensitive City Working Group with representatives from partner organisations, established during the development of the Strategy, will perform a key role in coordinating the implementation.

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1. A place-based context

Water has played a significant role in Fishermans Bend's rich history. First for Aboriginal people before European settlement, and after that from the area's settlers through to the businesses and residents of South Melbourne and Port Melbourne today.

The lagoons, wetlands and Yarra River (called Birrarung, meaning 'river of mists' in the Boon Wurrung and Woiwurrung languages), were a central focus of life in pre-contact Melbourne. The river was a conduit rather than a barrier. Together with the land beyond its banks, it provided a rich food source for fishing, hunting and gathering. The river is the focus of many mythological and spiritual (intangible) attachments, including creation stories (Extent, 2017).

Post European settlement, Fishermans Bend took its name from the large bend in the Yarra River north of present-day Coode Island. Further east, the low-lying Montague neighbourhood was a densely populated residential area from the 1870s until the 1930s. Built upon former wetlands, it was prone to flooding, with poor drainage and sanitary conditions (Context, 2017).

Today, Fishermans Bend is Australia's most ambitious urban renewal project and a future extension to the city that is planned to accommodate 80,000 residents and 80,000 workers by 2050 (Figure 1). At 485 hectares, it is more than twice the size of Melbourne CBD. Fishermans Bend will play a key role in the further evolution of inner Melbourne. It will be a world renowned place to live, work, visit and invest.



FIGURE 1: Fishermans Bend Precincts

1.1. The challenge

In the future, Melbourne is expected to experience more heatwaves and less rainfall, as well as more extreme storm events and flooding. These changing weather patterns present a number of challenges with social, economic and environmental implications. These need to be tackled through resilient and innovative water infrastructure planning.

Victoria is becoming warmer and drier. It is also now the fastest growing state in Australia, with a population expected to almost double to 11.2 million by 2056 (DELWP 2019). This growth is and will continue to put significant strain on our rainwater dependant water supply catchments. Without diversifying our water network, water security, both now and in the future for Fishermans Bend and wider Melbourne is at risk. The resilience of Victorian communities in responding to climate change challenges will be vital to lowering our vulnerability to heatwaves, flooding and economic impacts. Our responses must include heightened awareness and education as well as planning and infrastructure to keep people safe and maintain physical and mental health.

Of the challenges presented by the industrial history and geography of Fishermans Bend, none are more complex than flooding. This is especially so when climate change impacts like sea level rise are factored in. Fishermans Bend faces a major challenge from stormwater, riverine and coastal flooding sources. Key contributing factors include:

- proximity to Port Phillip Bay and the Yarra River
- a relatively flat geography meaning stormwater is slow to drain
- low-lying land where drainage outlet pipes can become immersed, meaning stormwater does not drain freely and can cause back flow
- built up nature of both the private and public realm - these hard surfaces with low permeability mean more rain becomes stormwater.

If not effectively managed, these issues will increase with climate change, as storm activity intensifies, and sea-levels rise (projected to rise by 0.8m by 2100, Melbourne Water 2017). The cumulative impacts of this are shown in **Figure 2**. Unless appropriately managed, flooding depths could exceed one metre in low-lying parts of Montague by the year 2100.



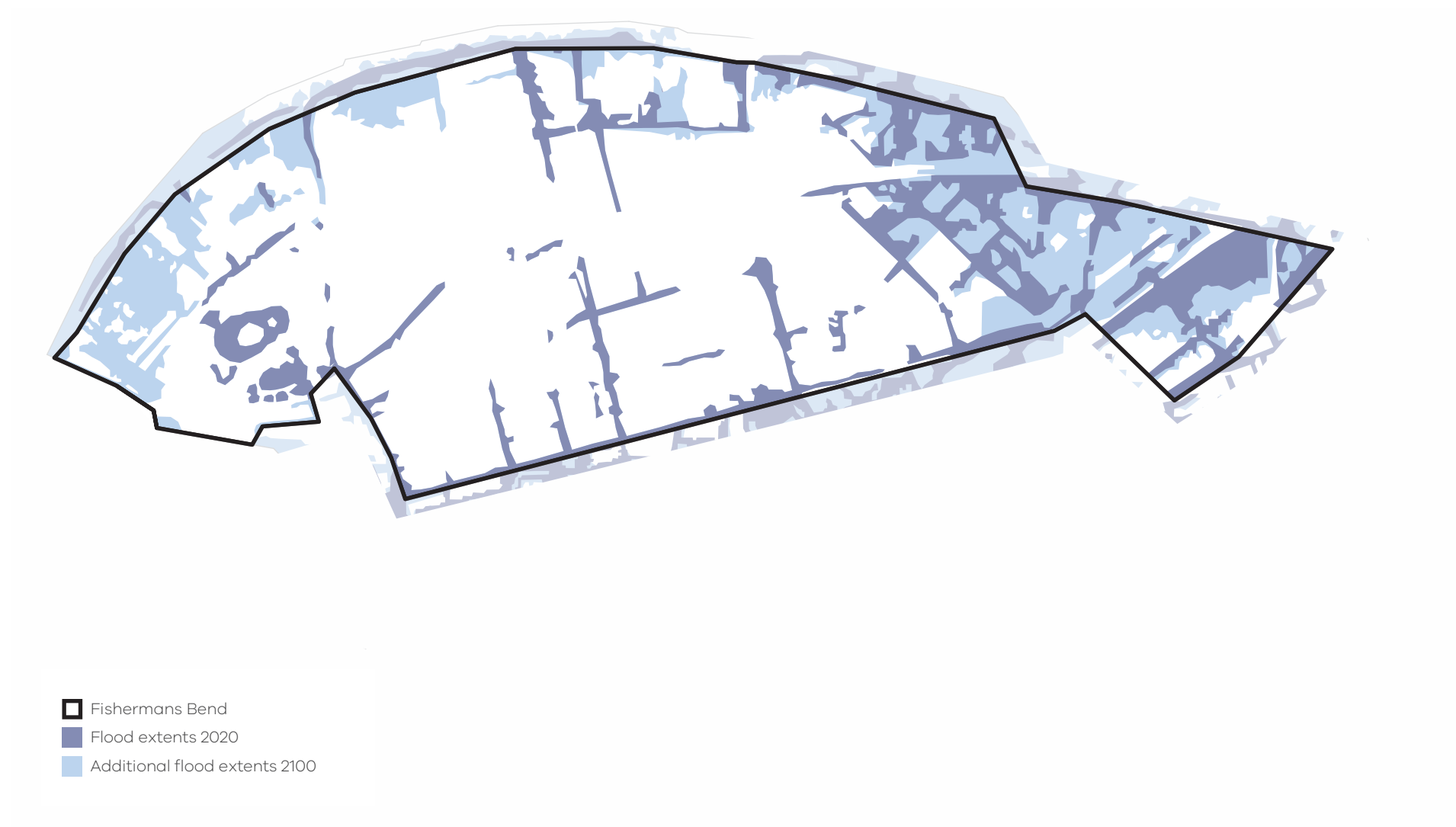


FIGURE 2: Shows current and future one per cent AEP for flood conditions (from all sources) in Fishermans Bend.

1.2. Planning and policy context

The *Fishermans Bend Framework* and planning provisions represent the position of the Victorian Government in relation to the delivery of its vision for “a thriving place that is a leading example for environmental sustainability, liveability, connectivity, diversity and innovation”. The Vision and Framework are underpinned by eight Sustainability Goals with Targets, Objectives and Strategies that outline how each Sustainability Goal will be reached. Of most relevance to this Strategy are Sustainability Goals four, five and six (**Figure 3**) and the targets contained in **Table 1**.

An Urban Ecology Study (background technical analysis to inform the development implementation plans for each Fishermans Bend precinct) has been prepared to investigate how these goals and targets may be achieved.

Fishermans Bend is registered as a Green Star Community and has planning provisions for the Green Star Design and As Built tool. Permits granted to construct a new building, to carry out works, alterations or additions require that projects must be registered as a minimum four or five Star Green Star Design and As-Built rating (or equivalent), dependant on typology with the Green Building Council of Australia. For certification, this must be submitted to the satisfaction of the responsible authority within 12 months of occupation. Green Star tool and credits are identified throughout the Strategy with the required actions.

Eight sustainability goals

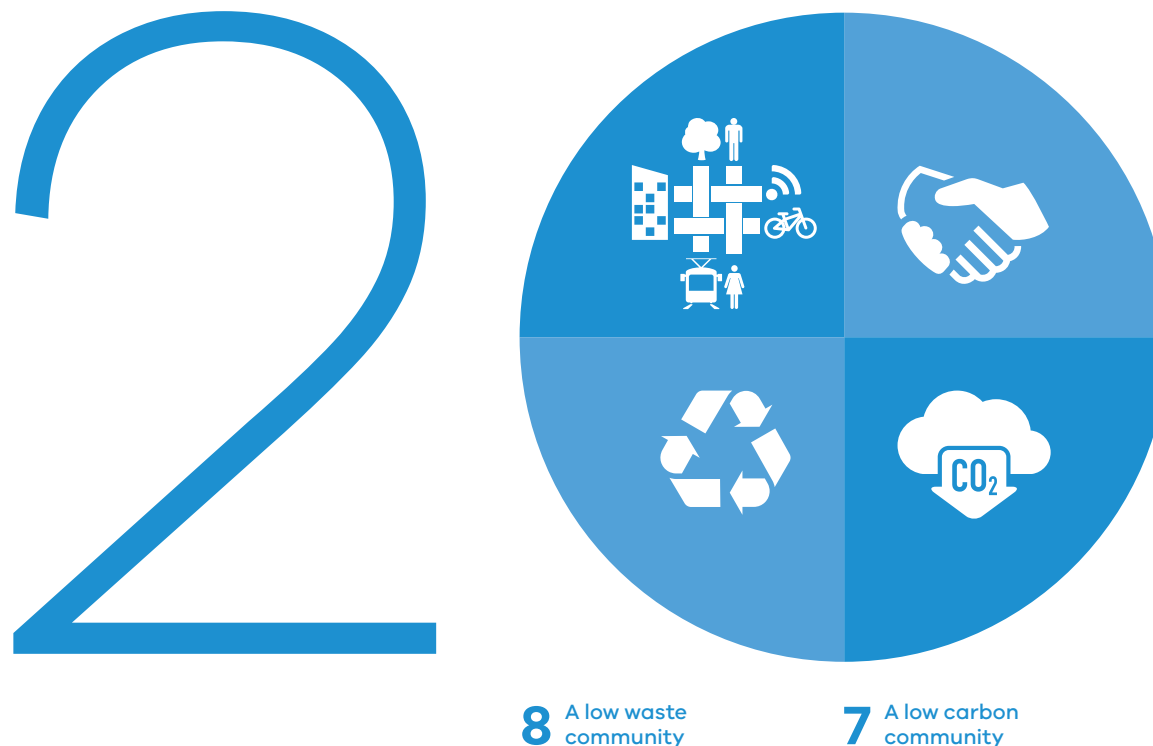
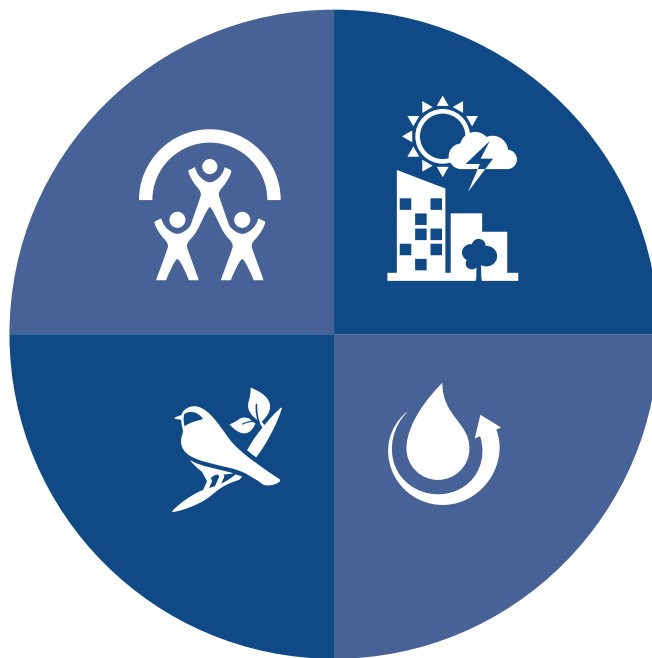


FIGURE 3: Fishermans Bend Vision and Framework Goals

5

3 An inclusive and healthy community

4 A climate resilient community



6 A biodiverse community

5 A water sensitive community

Targets for 2050



The urban heat island effect is reduced so that Fishermans Bend will be no hotter than inner Melbourne

The community is resilient to the shocks and stresses of climate change



Reduced impact of storm and flood events, including sea level rise

Nutrient discharges from stormwater and treated effluent to Port Phillip Bay are reduced

Net sewage discharge reduced by 50 per cent

Potable water demand of less than 100 litres per person per day



More than 90 per cent of the trees will be in good health by 2050

Greater diversity of plant species and fauna recorded compared to 2017 levels

TABLE 1: Sustainability Goals and Targets of the Fishermans Bend Framework relevant to this Strategy



1.3. Need for a water sensitive city approach

Fishermans Bend presents an ideal opportunity to build a city where water plays a pivotal role in ensuring economic, social and environmental sustainability. To achieve this, a bold collaborative and integrated water plan is required: A Water Sensitive City Strategy.

Sustainability Goal five, A Water Sensitive Community, aligns Fishermans Bend with *Water for Victoria*, as both commit to the need for a water sensitive city approach to manage water in urban environments. This goal articulates the need for active consideration of the urban water cycle and its role in delivering liveability, sustainability and climate resilience across public and private realms to benefit future residents and workers.

The Fishermans Bend Water Sensitive City Strategy supports that role and includes various water initiatives that respond to environmental, geotechnical and spatial constraints and will make Fishermans Bend an exemplar water sensitive city in international standards. They include collection and re-use of rainwater, treatment and use of recycled water, plus flood protection at a variety of scales and the integration of water in the landscape. These initiatives will boost community awareness of local conditions and encourage a risk-based approach to managing life within a floodplain.

1.4. Definitions

Alternative water sources

Non-drinking water that is harvested, treated and re-used. Includes rainwater, stormwater, and recycled water.

Annual Exceedance Probability (AEP)

The probability that a given flooding event will be exceeded in any one year. For example, a flood event with a one per cent AEP has a one per cent chance of being exceeded in any one year.

Integrated water management

A collaborative approach to planning that brings together all elements of the water cycle including sewerage, drinking water, stormwater and water treatment.

Precinct implementation plans

Each precinct in Fishermans Bend will have its own place-based implementation plan that elaborates on how the Fishermans Bend Vision and Framework will be achieved at a greater level of detail.

Green infrastructure

For the purpose of this strategy, defined as 'tree canopy, multi-layered vegetation, green roofs, green walls and green facades'. Green infrastructure is infrastructure that directly provides ecosystem services or supports the provision of those services within the urban environment.

Private realm

Property area that is privately owned and managed. Examples include residential, commercial, industrial, retail, parks, plazas, spaces and places that are predominately restricted but may be accessible to everyone, privately owned.

Public realm

Spaces and places that are open and freely accessible to everyone, regardless of their economic or social conditions. These spaces can include streets, laneways and roads, parks, public plazas, waterways and foreshores.

Stormwater

Water that falls on roads and other impermeable surfaces. Stormwater includes rainwater collected from trafficable areas (including terraces, driveways, paths, and other impervious surfaces at ground level). Unless captured or diverted to a filtration system (natural or manmade), stormwater will flow untreated into an urban creek, waterway or receiving water body.

Rainwater

Water that falls on roofs and other appropriate rainwater harvesting surfaces that can be collected and stored in a rainwater storage.

Smart rainwater tank

A rainwater tank that uses weather forecasting data and water level control technology to optimise the storage capacity to assist with flood management in major storm events.

Water recycling plant

For the purpose of this Strategy, a plant that uses multiple treatment processes to treat sewerage to a Class A standard, the highest grade of recycled water in Australia, so that it can be recycled for non-drinking water end uses. These end uses include toilet flushing, washing machines, garden irrigation and wash down (e.g. cars).

1.5. Structure

This strategy is structured into two parts:

- 1. The water sensitive strategy:**
vision, purposes and priorities that outline key outcomes for Fishermans Bend will be achieved.
- 2. Delivery and implementation:**
a multi-scale infrastructure framework describing who will be responsible for various components of this whole-of-government strategy.

2. Water Sensitive City Strategy

2.1. Vision

A water sensitive, climate resilient, biodiverse and liveable Fishermans Bend.

2.2. Purpose

The *Fishermans Bend Water Sensitive City Strategy* outlines how water will be managed and integrated into the urban landscape to meet the *Fishermans Bend Vision* (2016) and objectives of the *Fishermans Bend Framework* (2018).

2.3. Strategic pillars and priorities



Flood management

WATER SENSITIVE PRIORITIES

Avoid climate change shock

Flood mitigation

Flood-sensitive urban design

Community resilience



Climate resilient water system

WATER SENSITIVE PRIORITIES

Provide a climate resilient, fit for purpose water supply

Reduce potable water demand and effluent discharge to Port Phillip Bay

Enable water use efficiency



Urban ecology

WATER SENSITIVE PRIORITIES

Minimise nutrient discharge

Reduce urban heat island effect

Green infrastructure

FIGURE 4: The Strategy has three overarching pillars, with ten underlying priorities.

2.3.1. Flood management

Reducing the magnitude and impact of flooding is vital for the ongoing social and economic prosperity of Fishermans Bend.

Service level objectives

To appropriately manage flood risks now and into the future, overall design solutions identified in the Strategy were guided by service level objectives from the City of Melbourne, the City of Port Phillip and Melbourne Water, quantified in terms of its AEP, as shown in the below in **Figure 5**.

Flood management solutions to meet these service level objectives are informed by projected increases in rainfall intensity and sea levels associated with climate change. The minimum service level is five per cent AEP with all mitigation measures in place. This reduces the extent of major flood events significantly, as shown in **Figure 6**.

These surfaces must remain free of flooding up to a five per cent AEP :	<ul style="list-style-type: none"> • streets • footpaths • bike paths • private realm • public open space
These Surfaces must remain free of flooding up to a one per cent AEP :	<ul style="list-style-type: none"> • footpaths • private realm

Note: the five per cent AEP level of service excludes those areas of the public space, designated for distributed storage

FIGURE 5: Flooding and drainage level of service objectives, where flooding is defined as a water depth greater than 50mm.

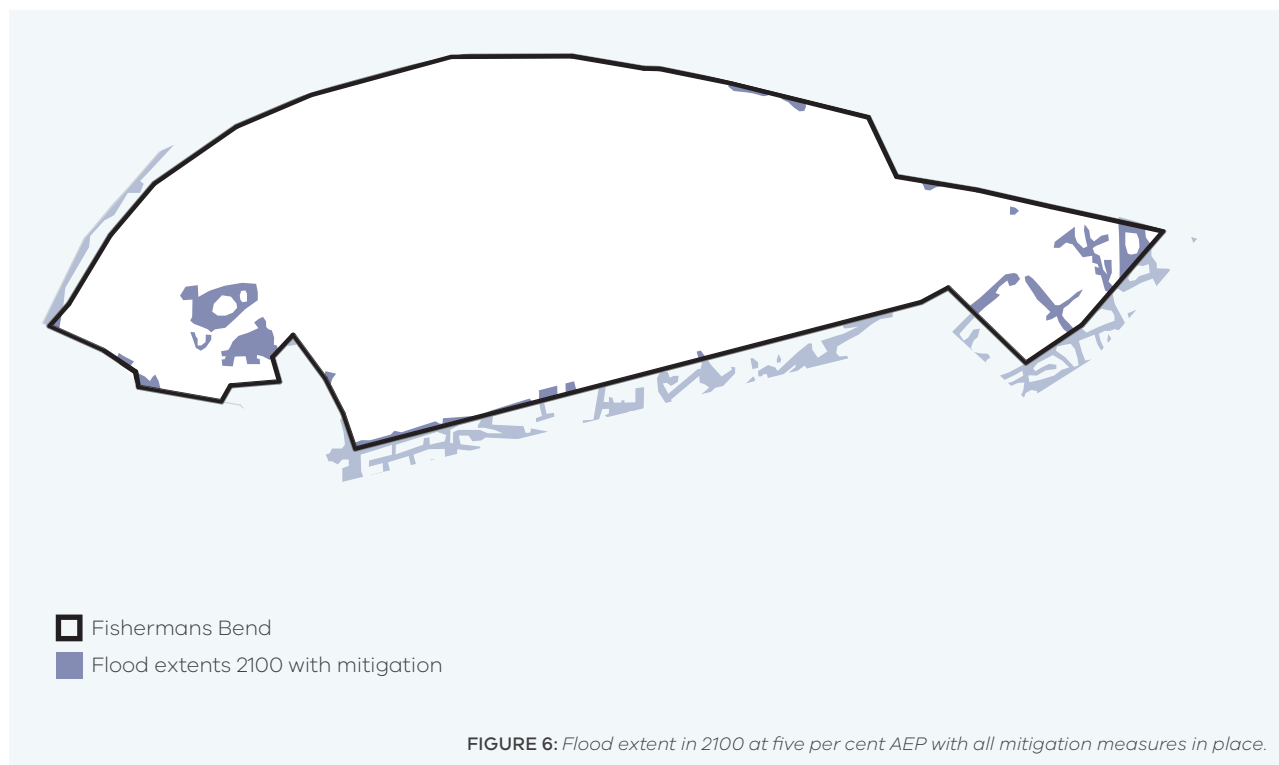


FIGURE 6: Flood extent in 2100 at five per cent AEP with all mitigation measures in place.