

Derbal Yiragan (Swan) Djarlgarro (Canning) Draft River Protection Strategy

**DRAFT Swan Canning River Protection Strategy
2024**

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Acknowledgement of Country

The Swan River Trust recognises and honours the Traditional Custodians of the Derbal Yiragan (Swan) Djarlgarro (Canning) river system and the Custodians of the land, waters, and community across Western Australia.

The Swan River, known as “Derbal Yiragan” in the Noongar language, translates to “turtle estuary”. For around 45,000 years prior to the arrival of settlers in 1829, this area was home to the Noongar people. They had a profound respect and familial bond with the rivers and land, living a life deeply intertwined with the health of their local environment and ecology.

The region was rich in wildlife, fish, and natural resources, providing sustenance for the local Aboriginal population. The Noongar people made extensive use of the foreshores as camping grounds, hunting areas, gathering spots, and trading posts with other tribes. They were stewards of the land and rivers, maintaining a spiritual bond and practising sustainability—they took no more than necessary and were mindful of the life cycles of the species they hunted to ensure a balanced ecosystem.

The Whadjuk people of the Noongar Nation are the Traditional Custodians of the majority of the Swan Canning Catchment, encompassing the main tributaries of the Swan and Canning rivers. The Whadjuk people, like all Aboriginal people, have a strong sense of responsibility to care for Country; a duty passed down through generations.

Our respect extends to all members of Aboriginal communities, both past, present and emerging. We are committed to preserving, celebrating, and learning from the rich culture, heritage and knowledge of Aboriginal peoples. The protection and preservation of the Derbal Yiragan (Swan) Djarlgarro (Canning) river system is crucial.

Preface

The Swan River Trust (the Trust) takes immense pride in introducing the Derbal Yiragan (Swan) Djarlgarro (Canning) River Protection Strategy. This strategy has been developed in accordance with the *Swan and Canning Rivers Management Act 2006* and supersedes the previous Swan and Canning River Protection Strategy (2015).

Developed through extensive consultation, including a comprehensive survey with the community, and workshops and interviews stakeholders, this new strategy recognises the distinctive values that the rivers hold for both residents and visitors. The strategy emphasises the need for coordinated efforts to preserve and protect these essential waterways.

The Trust extends its gratitude to all contributors who have helped shape this significant initiative, including the community, Aboriginal partners, natural resource management (NRM) groups, local government, State Government and other land managers.

The Derbal Yiragan (Swan) and Djarlgarro (Canning) rivers, along with their tributaries and the interconnected wetlands, define many of the recreational, economic, spiritual, and cultural landscapes of our region. These waterways serve as the lifeblood of our communities, nurturing a vital connection between residents and the natural world amidst our ever-expanding urban environment.

Every day, thousands of Western Australians engage with our waterways and wetlands—a privilege bestowed upon us by having one of the healthiest river systems among capital cities worldwide. These waterways carry an intrinsic significance for generations to come, and there is a collective anticipation that they will be treasured and safeguarded throughout the years, recognising the stewardship of the river system is a shared endeavour.

Managing our river system requires a multifaceted approach, and this strategy provides a framework for actions that will enhance the river system’s future. Rooted in lessons learnt from the past, it offers a collective vision, objectives and coordinated management strategies.

We must confront threats head-on, safeguarding the river system’s well-being, vibrancy, and accessibility amidst the challenges posed by climate change and rapid population growth. While comprehensive implementation of the strategy will include securing new funding sources, the care of our river system is more crucial than ever.

The Trust commits to regular progress reporting on the strategy, with updates to be provided every two years. The strategy sets ambitious management targets aligned with the aspirations of our community, Aboriginal partners, NRM groups, local government, State Government and other land managers - a collective to protect our vital river system. Looking ahead, it establishes a standard of care that aims to adapt and improve river management over the next decade.

Together, we will forge a resilient path toward a healthy and thriving river system today, tomorrow and into the future.

Vision

A healthy, thriving river system for nature and people, to be cared for and enjoyed as the heart of our community.

Strategic goals

The Derbal Yiragan (Swan) Djarlgarro (Canning) River Protection Strategy has several key goals:

1. **Identify core values** that drive strategic decisions through engagement, inclusion and collaboration with the community, Aboriginal partners and stakeholders.
2. **Identify and communicate priority threats** facing the river system and set achievable objectives to tackle these challenges.
3. **Provide strategic direction** and clear guidance to all stakeholders and agencies involved in the care and management of the Derbal Yiragan (Swan) Djarlgarro (Canning) river system and ensure that collective efforts are aligned and purposeful.
4. **Foster collaboration** by bringing together the community, Aboriginal partners, NRM groups, local government, State Government and other land managers to develop the strategy and continue to provide collaboration opportunities during the strategy's implementation to amplify impact of joint efforts.
5. **Secure sustainable resourcing** to be used by stakeholders by identifying resourcing required to achieve the strategy's vision.
6. **Establish a long-term, high-level framework** that can be applied to specific management actions at local scales over shorter periods. The framework aims to align local actions with the strategy's 10-year objectives, allowing stakeholders to work towards a shared vision through adaptive management practices.

The connection of the waterways to the Whadjuk people spans more than 45,000 years
The Waugal (snake or rainbow serpent) is the major spirit for Noongar people, central to beliefs and customs.
As it slithered over the land, its body scoured out the course of the rivers, bays and lakes

The Swan Canning Catchment is

2,090 km²

The Swan Avon Catchment is

126,000 km²

The combined Swan Avon River is 280km long - that's almost twice the size of Perth's coastline

The catchment supports a **diverse urban, industrial and agricultural** environment



The river system is a **tourism hotspot**, offering exploration of natural beauty, historical sites, and local culture

The estuary supports many **different habitats**, including open water, sand shallows, tidal mudflats, tidal samphire marshes, fringing sedges and rushes, fringing woodlands, submerged macrophytes, seagrass and macroalgae, riffles and pools, marine intertidal zones, woody debris and interconnected wetlands

High-quality **parks and reserves** line the banks of the rivers, providing a host of different recreational opportunities, such as exercising, picnicking, boating and kayaking

Land birds, shore birds, migratory birds and water birds all live within the river system

Approximately **20-25 resident dolphins** live within the Riverpark

There are more than **30 shipwrecks** in the Swan River

There are more than **200 species of fish** known to inhabit the Riverpark

The Swan Canning Estuary is generally a **micro-tidal** (<1m) estuary, however water levels vary >2m with high pressure systems and storm surges

Paddleweed (*Halophila ovalis*) is the dominant species of seagrass in the Swan and Canning rivers, providing approximately **403 ha of seagrass habitat**



The Derbal Yiragan (Swan) Djarlgarro (Canning) river system

The Derbal Yiragan (Swan) Djarlgarro (Canning) river system extends well beyond the Swan and Canning rivers. The Gogulgar (Avon) River, despite its historical distinction, actually constitutes the upper reaches of the Swan River. All the tributaries, waterways, and wetlands that make up the broader Avon catchment are part of the Derbal Yiragan (Swan) Djarlgarro (Canning) river system.

The Swan Canning Catchment, a subset of the larger Swan Avon Catchment, encompasses the majority of the Perth metropolitan region and extends into the northern regions of Chittering and Toodyay. The major tributaries of the Derbal Yiragan (Swan) River include the Mandoon (Helena) River, Wooroloo, Susannah, Ellen, Bayswater, Bennett, Henley and Jane brooks, Blackadder Creek, and South Belmont Main Drain. Tributaries entering the Djarlgarro (Canning) River include the Southern and Wungong rivers, Churchman, Munday, Bickley and Yule brooks, Mills Street Main Drain and Bannister Creek. The main tributaries to the Derbal Yiragan (Avon) River include the Yilgarn, Mortlock and Lockhart rivers. Thus, the Derbal Yiragan (Swan) Djarlgarro (Canning) river system is a complex and expansive network, reaching far beyond its namesake rivers, as shown in the below map.

DERBAL YIRAGAN (SWAN) DJARLGARRO (CANNING) RIVER SYSTEM

GOGULGAR (AVON) RIVER

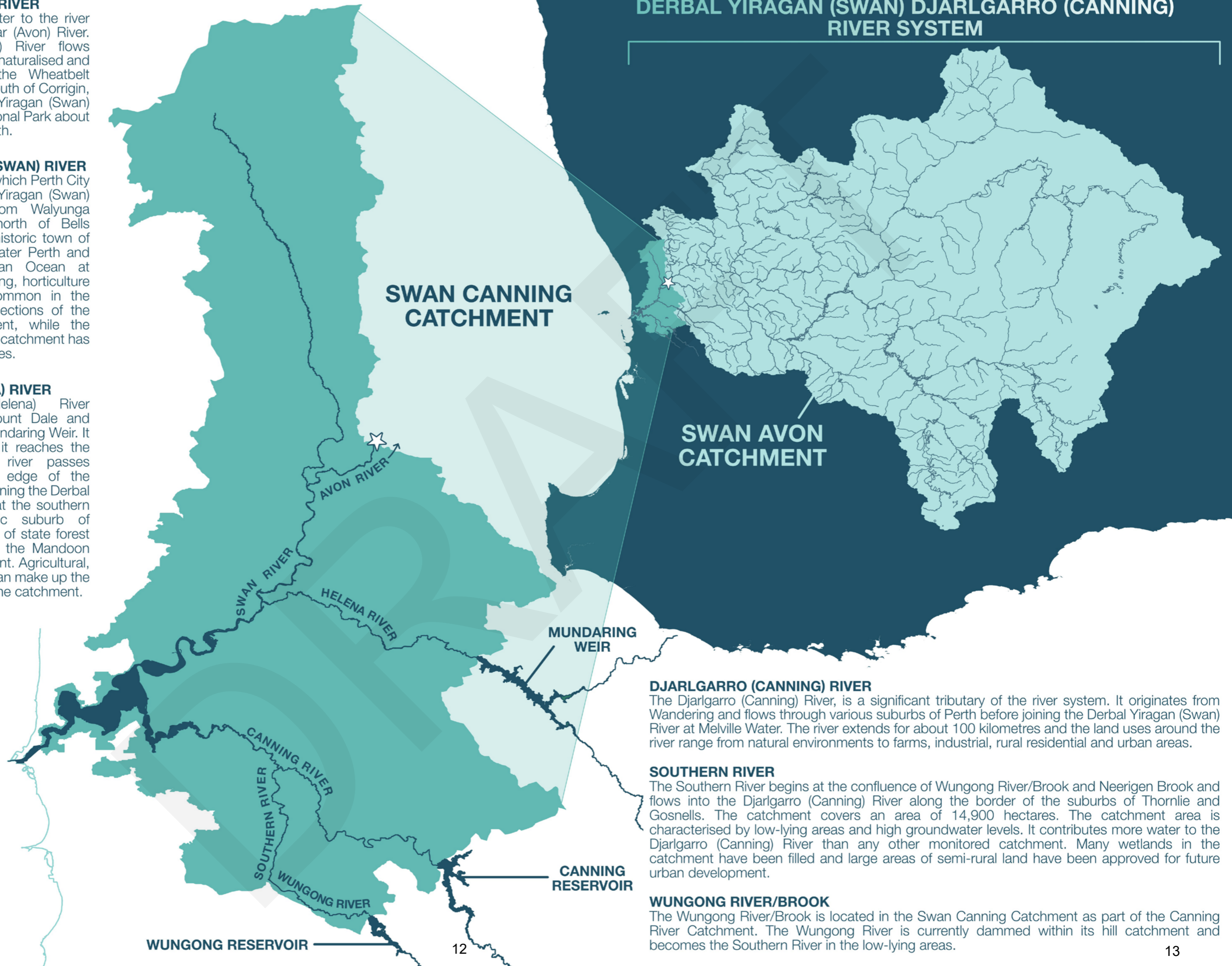
A major source of water to the river system is the Gogulgar (Avon) River. The Gogulgar (Avon) River flows through an expanse of naturalised and agricultural land in the Wheatbelt region, from the hills south of Corrigin, becoming the Derbal Yiragan (Swan) River in Walyunga National Park about 30 kilometres from Perth.

DERBAL YIRAGAN (SWAN) RIVER

The main tributary on which Perth City was built, the Derbal Yiragan (Swan) River flows west from Walyunga National Park (just north of Bells Rapids), through the historic town of Guildford, through greater Perth and through to the Indian Ocean at Fremantle. Cattle grazing, horticulture and viticulture are common in the upper and northern sections of the estuary and catchment, while the southern portion of the catchment has urban and industrial uses.

MANDOON (HELENA) RIVER

The Mandoon (Helena) River originates east of Mount Dale and flows north-west to Mundaring Weir. It then flows west until it reaches the Darling Scarp. The river passes through the western edge of the Darling Scarp before joining the Derbal Yiragan (Swan) River at the southern edge of the historic suburb of Guildford. Large tracts of state forest and bushland exist in the Mandoon (Helena) River catchment. Agricultural, light industrial, and urban make up the remaining land use in the catchment.



DJARLGARRO (CANNING) RIVER

The Djarlgarro (Canning) River, is a significant tributary of the river system. It originates from Wandering and flows through various suburbs of Perth before joining the Derbal Yiragan (Swan) River at Melville Water. The river extends for about 100 kilometres and the land uses around the river range from natural environments to farms, industrial, rural residential and urban areas.

SOUTHERN RIVER

The Southern River begins at the confluence of Wungong River/Brook and Neerigen Brook and flows into the Djarlgarro (Canning) River along the border of the suburbs of Thornlie and Gosnells. The catchment covers an area of 14,900 hectares. The catchment area is characterised by low-lying areas and high groundwater levels. It contributes more water to the Djarlgarro (Canning) River than any other monitored catchment. Many wetlands in the catchment have been filled and large areas of semi-rural land have been approved for future urban development.

WUNGONG RIVER/BROOK

The Wungong River/Brook is located in the Swan Canning Catchment as part of the Canning River Catchment. The Wungong River is currently dammed within its hill catchment and becomes the Southern River in the low-lying areas.

INDIAN OCEAN

WUNGONG RESERVOIR

Key issues and threats

The Derbal Yiragan (Swan) Djarlgarro (Canning) river system faces a number of historical, current and emerging threats, such as climate change, pollution, pressures from urban, industrial and agricultural development and increasing recreational demand. Understanding these threats is crucial for the formulation of effective strategies aimed at preserving the ecological integrity and amenity of the river system, and to do so requires commitment and adequate investment.

Three key overarching issues have been identified and are explained below:

Population growth

Perth continues to undergo rapid growth, with the population doubling during the past 30 years to approximately 2.3 million, and further predicted to grow to 3.5 million people by 2050. Increasing demand for use of the rivers and their foreshores and more urban and rural developments throughout the catchment are placing increased pressure on the river system. There is a need to balance development and use with the conservation and enhancement of the riverine environment, so that the river system remains healthy and thriving for future generations.

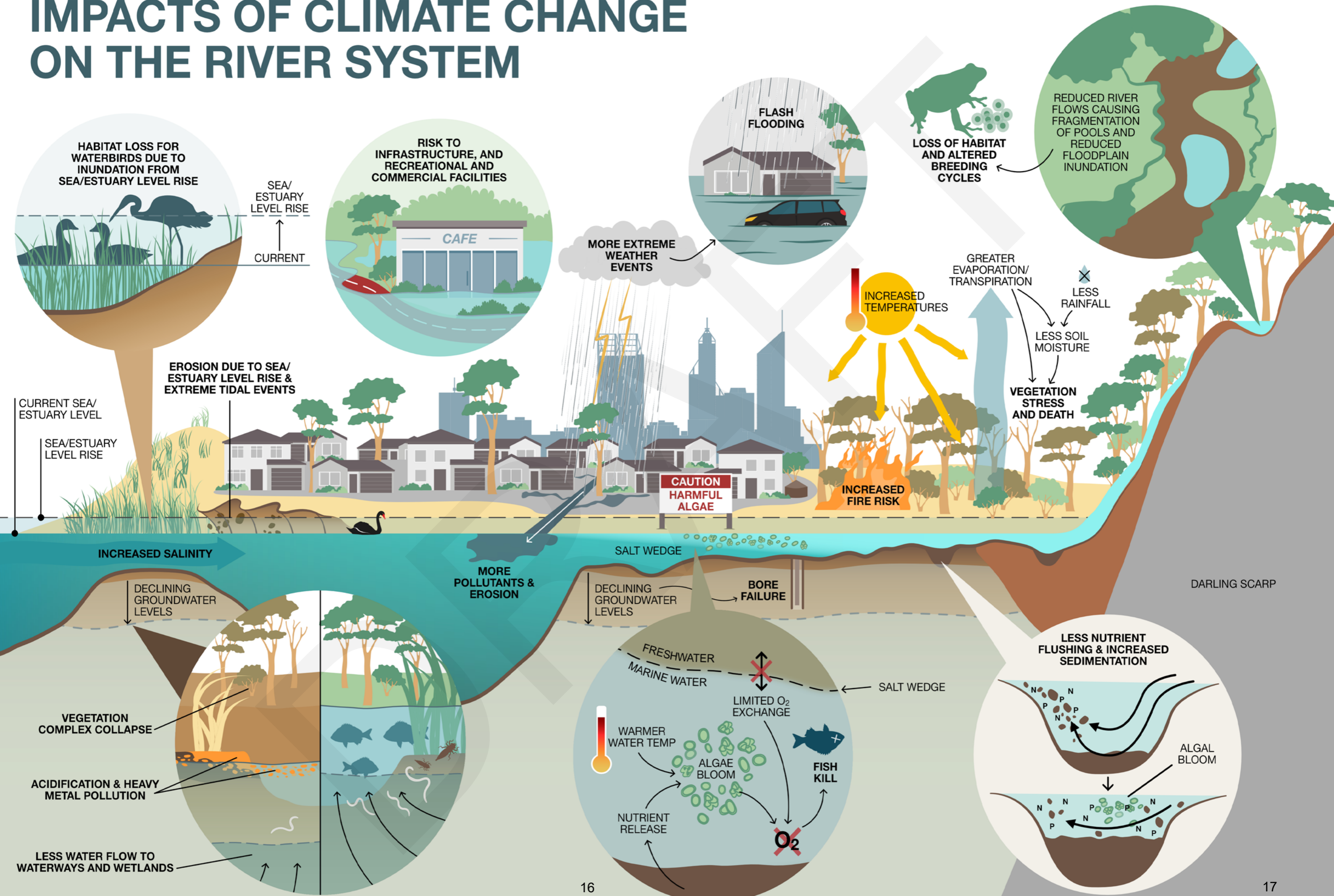
Climate change

Globally, climate change is recognised as one of the most serious environmental issues faced today. It is predicted to cause rising sea and estuary levels, increased temperatures, shifting rainfall patterns, and altered frequency of extreme weather events. This is expected to impact the river system, affecting groundwater levels and water flows and quality, which in turn impact on the systems' ecological functions, biodiversity, and the ability for the community to continue to interact and recreate in and around the rivers. It is important that every opportunity is taken to further investigate the likely impacts of climate change on the river system and to ensure that future management decisions are proactive and adaptive. Please refer to the infographic on the next page and the DBCA website for further information about climate change and the river system.

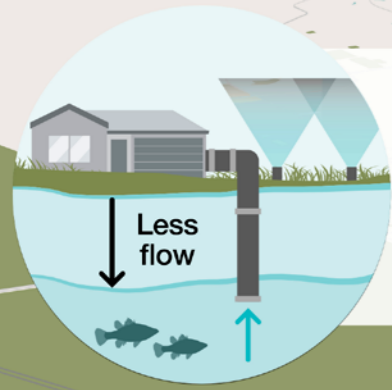
Resourcing

Commitment and resourcing play a pivotal role in the ongoing maintenance and protection of the river system. The health and vitality of the river system are dependent on the continuous dedication of various stakeholders. Adequate and continuous resourcing, in terms of both funding and personnel, is crucial for effectively implementing strategies. Resourcing needs to be long-term and consistent to strategically and proactively manage threats to the ecological and amenity values of the river system.

IMPACTS OF CLIMATE CHANGE ON THE RIVER SYSTEM



KEY THREATS TO THE RIVER SYSTEM

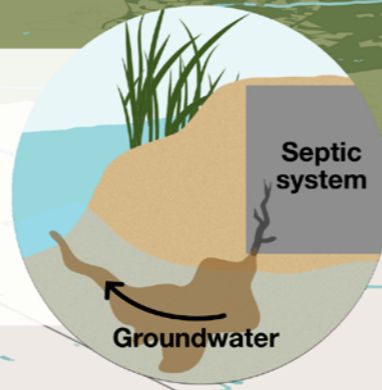


Water abstraction

Water abstraction results in less flow being available to sustain aquatic ecosystems and protect culture and heritage values.

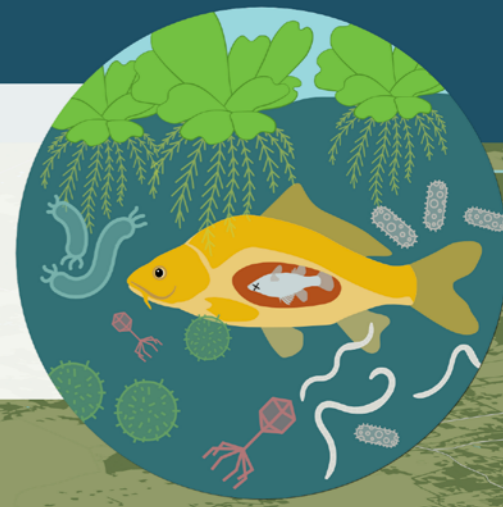
Contaminated water

Contamination can enter waterways through drainage systems and groundwater movement from industrial areas, old landfill sites, leaking storage tanks, uncontrolled fill, wastewater disposal systems and overflow from sewerage pipes and pumping stations.



Weeds, pests, and diseases

Weeds can overrun foreshore areas and riverbanks and clog waterways. Invasive pests like feral fish, foxes, cats, rabbits, and pigs can prey on local animals and plants and harm waterways. Diseases and parasites, such as phytophthora and polyphagous shot-hole borer, can affect plant and animal health.



Wildlife entanglements and ingestion of pollutants

Pollutants that end up in the river system pose a significant risk to wildlife through ingestion or entanglement, such as fishing line entanglements and ingestion of plastics.



Erosion

Erosion as a result of poor land, foreshore, and asset management can lead to increased sedimentation in the rivers. This can interfere with navigation, impact channel migration, cause inundation and destabilise riverbanks.



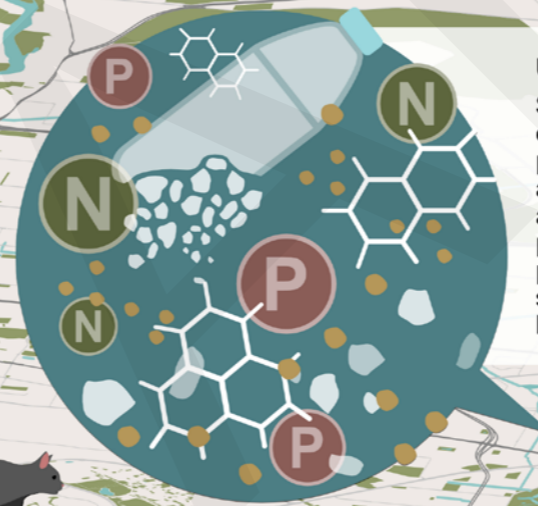
Agriculture

Agriculture can lead to nutrients and other contaminants entering the waterways and wetlands. Livestock access to waterways can degrade riverbanks and foreshore areas and increase turbidity.



Urban drains

Stormwater and groundwater drains are a year-round source of pollutants from industry, agriculture, and residential areas to waterways and wetlands. Pollutants include plastics, litter, pathogens, nutrients, perfluoroalkyl and polyfluoroalkyl substances (PFAS), sediment and hydrocarbons.

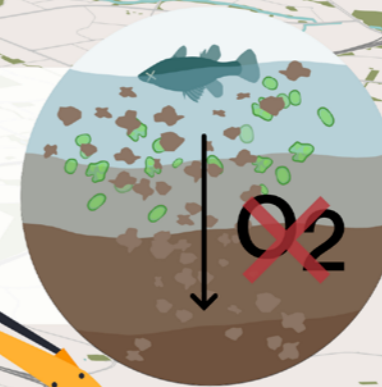


Fertilisers and pesticides

The use of fertilisers and pesticides in urban areas and agricultural lands within the catchment can result in them entering waterways and wetlands, through urban drainage systems and groundwater movement.

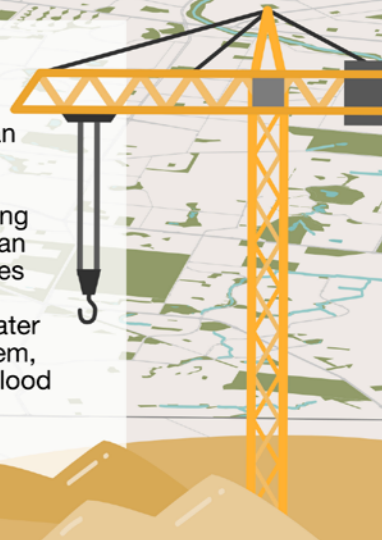
Sediment

Activities like land clearing, stormwater management (drains) and new developments contribute significantly to the sediment load in our waterways and wetlands. This sediment fills river pools and wetlands, damaging crucial habitats, smothering aquatic plants and reducing water quality.



Construction and development

Construction sites can lead to significant sediment and other pollutant loads entering the river system. Urban development increases impervious surfaces, altering the groundwater and stormwater system, which may increase flood risks.

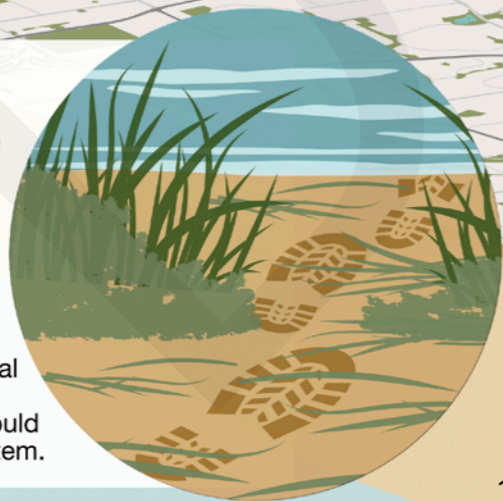


Human disturbance

As more people interact with the rivers and foreshore, risks to wildlife and vegetation increase, such as vehicle wildlife strikes, trampling, and disturbance of habitats. Boating can increase the risk of eroding and damaging foreshores from boat wake and improper storage, while also increasing the risk of chemical pollution through antifoulants, detergents and fuel leaks.

Growing user demand

With population growth, the demand for both recreational and commercial use of the rivers and foreshores is anticipated to increase. Without proper planning, this could potentially affect the health and amenity of the river system.



Vegetation clearing and fire

Leads to biodiversity loss and fragmentation of habitats. This impacts urban greening and cooling efforts and increases the risk of erosion.

The Swan and Canning Rivers Management Act 2006

The *Swan and Canning Rivers Management Act 2006* (SCRM Act) provides a statutory framework that enables collaboration between multiple State and local government agencies and facilitates community consultation on matters affecting the Derbal Yiragan (Swan) Djarlgarro (Canning) river system.

Before the preceding *Swan River Trust Act 1988* (SRT Act) was in place, care and management of the rivers was fragmented, with the responsibility divided over almost 30 different State and local government agencies. The SRT Act saw the establishment of the Swan River Trust, which had authority over the river system and brought together all these agencies to ensure a unified and consistent approach in the planning, protection and management of the rivers. The current SCRM Act further developed this approach, through the establishment of **management areas**, **guiding principles** and the requirement to develop a **River Protection Strategy**: a document that outlines the roles and responsibilities of all parties to achieve shared objectives towards the management of the river system. The first River Protection Strategy was released in 2015. This new strategy supersedes the previous version and establishes the strategic direction for the river system's protection for the next decade and beyond.

Key legislative management areas

Swan Canning Riverpark and the River reserve

The Swan Canning Riverpark (the Riverpark) consists of the land and waterways of the Swan, Canning, Helena and Southern rivers and public foreshore reserves surrounding them. The River reserve consists of the waterways of the Swan, Canning, Helena and Southern rivers and does not include the surrounding foreshore reserves.

The Swan River Trust is vested with the care, control and management of the River reserve and is responsible for planning and managing the waterways and conservation reserves of the Riverpark. It has joint responsibility for the Riverpark's shoreline in conjunction with other foreshore land managers, including local governments and several State Government agencies.

Development control area

Land use planning and development in the development control area (DCA) is subject to the approval processes under Part 5 of the SCRM Act and the Swan and Canning Rivers Management Regulations 2007. This area includes the waterways of the Swan and Canning rivers and the adjoining Parks and Recreation reserves (extending upstream from the Fremantle Traffic Bridge to Moondyne Brook on the Avon River, to the Lower Diversion Dam on the Helena River, along the Southern River to the Allen Road crossing and the Canning River to its confluence with Stinton Creek). In some cases, the DCA includes private property. Electronic copies of the DCA maps are available via the DBCA website.

Catchment

The total catchment area is approximately 126,000km², inclusive of both the Swan Canning Catchment and Swan Avon Catchment, and is referred to as the 'river system' throughout this document (please see map on page 9). Groundwater and surface water flows into the Riverpark from tributaries and drains across the catchment. Land and water management practices of the surrounding and outer catchments directly influences the water quality in the river system. The work undertaken by many organisations extends beyond the immediate boundaries of the Riverpark and into the broader catchment. Natural resource management groups and local governments play a particularly important role when undertaking these broader catchment activities, which support the ecosystem health of the Riverpark.

GUIDING PRINCIPLES OF THE SCRM ACT

The SCRM Act outlines key principles that must be regarded by all stakeholders to guide effective planning, development and management decisions in order to effectively protect the ecological health, community benefits, and amenity of the river system.

SUSTAINABILITY



1. Sound environmental practices and procedures should be adopted as a basis for sustainability for the benefit of all human beings and the environment today, while considering the environmental, social and economic needs of future generations.
2. Environmental, social and economic factors should be considered in decision-making, with the objective of improving community well-being and the benefit to future generations.
3. Environmental practices and procedures should be cost-effective and in proportion to the significance of the environmental risks and consequences being addressed.

PRECAUTIONARY



1. Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
2. In the application of the precautionary principle, decision-making should be guided by;
 - a. a careful evaluation to avoid serious or irreversible damage to the environment wherever possible; and
 - b. an assessment of the risk-weighted consequences of the options.



INTERGENERATIONAL EQUITY

The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.



BIODIVERSITY & ECOLOGICAL INTEGRITY

Biodiversity and ecological integrity should be maintained or enhanced as part of the irreplaceable life support systems upon which the earth depends.



SHARED RESPONSIBILITY

Protection of the environment is a responsibility shared by Government, industry, business, the community and the people of the State.



BEST PRACTICE

When designing policies, systems, procedures or technologies, the best practicable measures available at the time should be used.



CONTINUOUS IMPROVEMENT

Implementation of natural resource management should aim for continuous improvement and extend beyond compliance with relevant laws and requirements.



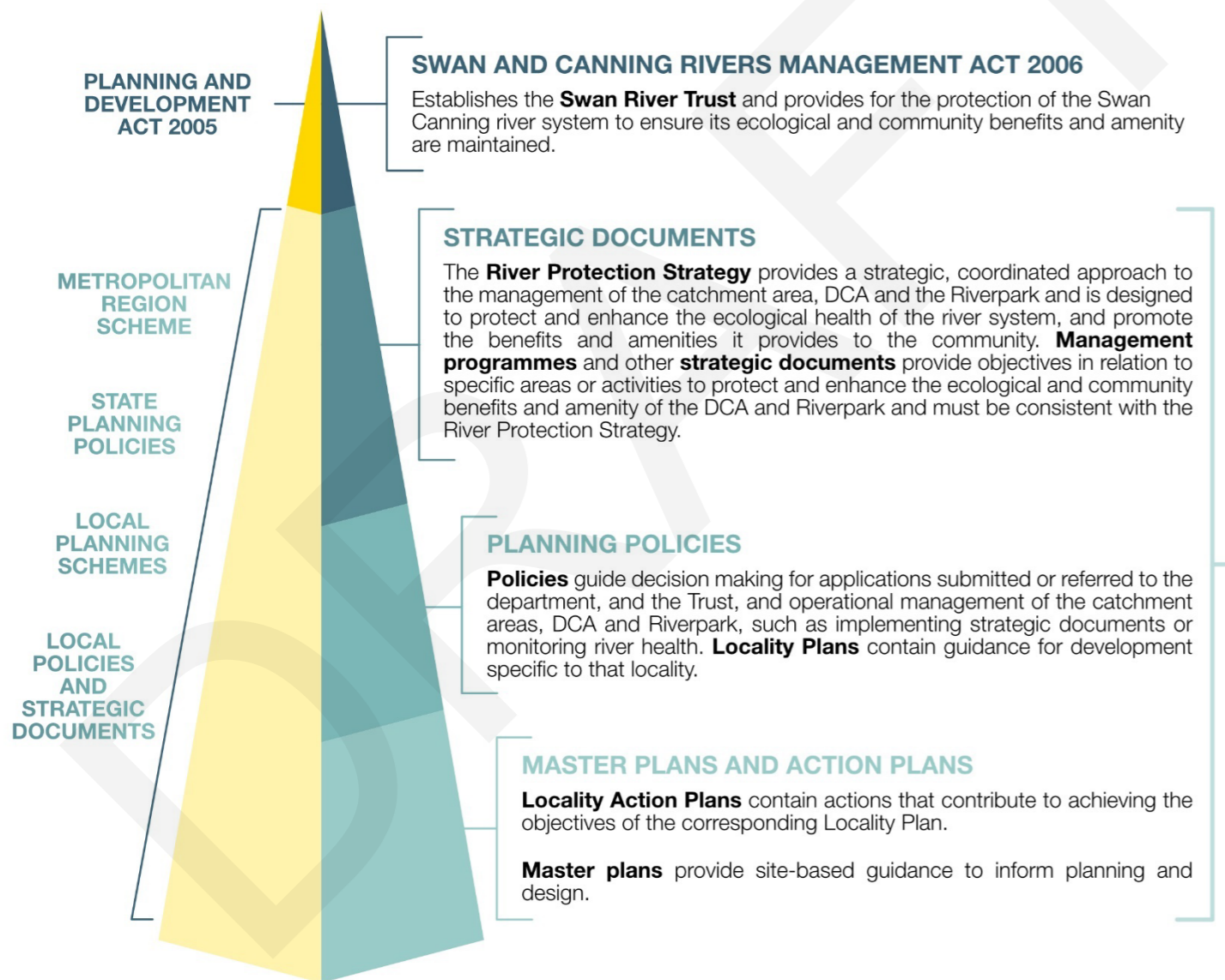
ACCOUNTABILITY & TRANSPARENCY

1. Members of the community should be given;
 - a. access to reliable and relevant information; and
 - b. opportunities to participate in policy and programme development.
2. Decisions should be made in a transparent manner and be made public.

Derbal Yiragan (Swan) Djarlgarro (Canning) river system planning framework

The below diagram illustrates the foundation for planning and decision-making undertaken for the catchment area, River reserve, Riverpark and DCA, which informs, and is equally informed by, the State and local planning framework.

This planning framework provides a clear structure to ensure consistency in decision making, collaboration between agencies, and transparency of information for the community, with the goal of ensuring the protection and enhancement of the ecological and community benefit and amenity of the river system.



Collaboration is key

Management of the river system relies upon the collaborative efforts of many different stakeholders. The community, Aboriginal partners, natural resource management groups, local government, State Government and other land managers, all play a role in the protection of the river system.

While each group has independent responsibilities, they all need to work together to deliver the key objectives outlined in this strategy. The following map shows the sub-regional groups in the Perth Natural Resource Management region and key local governments that manage land within the river system.

Besides the SCRM Act, a number of other pieces of legislation have defined roles and responsibilities for the protection of the river system, and are listed below. See [Legislation](#) for further information about how these apply to the river system.

- *Aboriginal Heritage Act 1972 (WA)*
- *Agricultural Produce Commission Act 1988*
- *Australian Maritime Safety Authority Act 1990*
- *Biodiversity Conservation Act 2016*
- *Biosecurity and Agricultural Management Act 2007*
- *Climate Change Act (not yet passed)*
- *Conservation and Land Management Act 1984*
- *Contaminated Sites Act 2003*
- *Environmental Protection Act 1986*
- *Fish Resources Management Act 1994*
- *Heritage Act 2018*
- *Jetties Act 1926*
- *Land Administration Act 1997*
- *Local Government Act 1995*
- *Main Roads Act 1930*
- *Metropolitan Redevelopment Act 2011*
- *Metropolitan Water Supply, Sewerage, and Drainage Act 1909*
- *Mining Act 1978*
- *Planning and Development Act 2005*
- *Pollution of Waters by Oil and Noxious Substances Act 1987*
- *Public Health Act 2016 / Health Act 1911*
- *Public Transport Authority Act 2003*
- *Rights in Water and Irrigation Act 1914*
- *Shipping and Pilotage Act 1967*
- *Soil and Land Conservation Act 1945*
- *Water Agencies (Powers) Act 1984*
- *Water Corporations Act 1995*
- *Water Services Act 2012*
- *Waterways Conservation Act 1976*
- *Western Australian Marine Act 1982*
- *Western Australian Tourism Commission Act 1983*

Subregional groups in the Perth Natural Resource Management region work with various stakeholders including land managers to help promote and implement environmentally sustainable river management. They are drivers in restoration and rehabilitation projects throughout the river system and play an important role in the education of landcare practices to stakeholders and the community.

↑ SHIRE OF CHITTERING
SHIRE OF GINGIN

↑ NORTH EAST SUBREGION

NORTH SUBREGION

EAST SUBREGION

SOUTH SUBREGION

Local governments are integral to the management of the river system. Their role is vital in maintaining the balance between recreational use, development, and ecosystem health. They work closely with many different stakeholders to manage the river system, and their understanding and knowledge of the land they manage is invaluable. They actively engage with their local communities, providing an important link between community needs and river system management.

SHIRE OF PEPPERMINT GROVE

TOWN OF MOSMAN PARK

TOWN OF CLAREMONT

CITY OF NEDLANDS

TOWN OF EAST FREMANTLE

CITY OF FREMANTLE

CITY OF PERTH

CITY OF MELVILLE

CITY OF VINCENT

CITY OF SOUTH PERTH

CITY OF CANNING

CITY OF BAYSWATER

TOWN OF VICTORIA PARK

CITY OF BELMONT

CITY OF GOSNELLS

SOUTHERN RIVER

CITY OF ARMADALE

WUNGONG RIVER

SWAN RIVER

TOWN OF BASSENDEAN

HELENA RIVER

SHIRE OF MUNDARING

CITY OF KALAMUNDA

CITY OF SWAN

AVON RIVER

Values and enablers

A healthy, thriving river system for nature and people, to be cared for and enjoyed as the heart of our community.

The vision for the river system was formulated through discussions with the community, Aboriginal partners, and key stakeholders including natural resource management groups, local government, State Government and other land managers. A community survey was conducted with a representative sample of the Perth metropolitan area population to help identify key values of the river system. It mirrors the importance that the Perth community assigns to the river system.

The 2030 Sustainable Development Agenda developed by the United Nations Environmental Program underscores the vital connections between development, environmental preservation, human welfare, and the comprehensive enjoyment of numerous human rights. The long-term preservation of the river system, enabling it to flourish in terms of the variety of life it nurtures and the lifestyle and wellbeing advantages it offers to the community, forms the fundamental principle of this strategy. A healthy river system helps provide for healthy people.

Values

Healthy river system

A healthy river system is fundamental to ecological integrity. The river system is a key feature of the Perth landscape, and its intrinsic value is to be protected. Four key values were identified: **catchment**; **water**; **biodiversity** and **foreshore**. If these core environmental values are maintained, then the river system can continue to thrive now and into the future and can provide for healthy people.

Healthy people

The rivers are an integral part of the Perth lifestyle and provide a multitude of benefits to the social, mental, physical and spiritual wellbeing of the community. Three key values were identified: **lifestyle**; **culture** and **connection to nature**.

The rivers are a meeting place, and the community feels a great connection to the shared history and culture of the river system, especially the long history of Aboriginal culture and custodianship of Derbal Yiragan (Swan) and Djarlgarro (Canning).

As Perth continues to grow and develop, it has become clear the connection to nature that the river system provides is highly valued by the community.

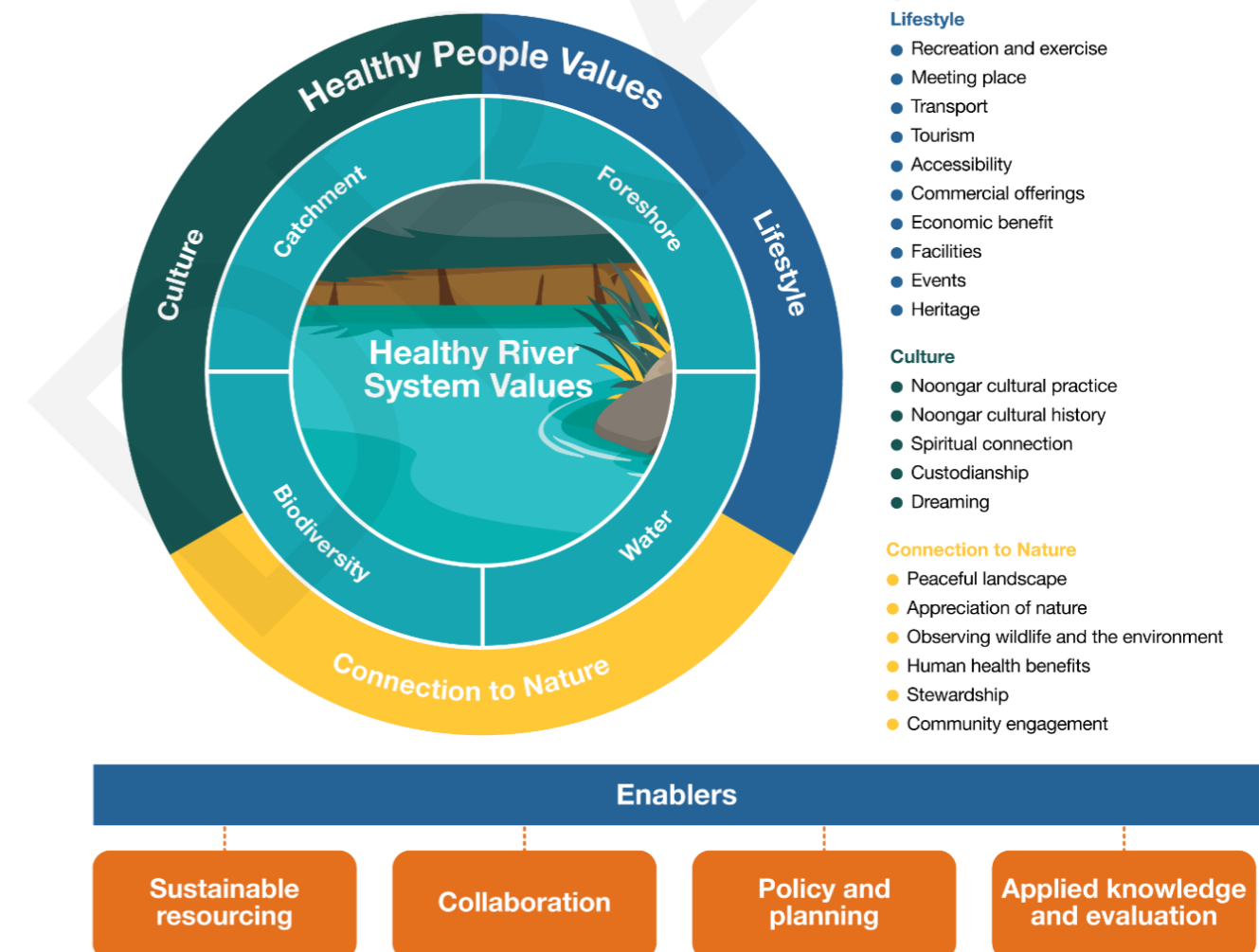
Enablers

The community, Aboriginal partners, natural resource management groups, local government, State Government and other land managers need to need to work together to successfully protect these river values, and a series of key 'enablers' have been identified to achieve this: **sustainable resourcing**, **collaboration**, **policy and planning**, and **applied knowledge and evaluation**.

Strategy framework

The values and enablers are inherently linked. Together they form the overall framework for the management of the river system into the future. The river system is to be protected for its intrinsic value. Additionally, if healthy river system values are sustained, the community can continue to safely access and enjoy the river system, whether that be to swim, fish, sail, travel, appreciate nature, exercise or relax. Building a future in which the community can continue to engage and connect with a healthy river system is vital to its ongoing protection.

An objective has been set for each value and enabler for where the community, Aboriginal partners and stakeholders would like to be in 10 years. Thirty-seven strategies to be delivered by a range of stakeholders then outline what is required to achieve each of the objectives in the face of current and emerging threats. This framework provides strategic direction for stakeholders involved in the management of the river system, with the understanding that collective action will be necessary to achieve the desired objectives and to successfully implement the strategies.



Healthy river system

- | | |
|-------------|---|
| Objective 1 | Manage the catchment to protect biodiversity, waterways and wetlands. |
| Objective 2 | Manage water quality and quantity to support the river system's ecological and cultural values. |
| Objective 3 | Protect and enhance local biodiversity of the river system and build resilience to climate change. |
| Objective 4 | Restore and revegetate foreshores and implement fit-for-purpose foreshore treatments that are maintained and enhanced. |

Healthy people

- | | |
|-------------|---|
| Objective 5 | Enhance culture, community lifestyle and connection by providing appropriate places in the river system to socialise, recreate and relax. |
| Objective 6 | Strengthen respect of and care for the river system by recognising, conserving and sharing Noongar and other Aboriginal culture and knowledge, and retaining and conserving Aboriginal sites and places. |
| Objective 7 | Connect people with nature in the river system. |

Enablers

- | | |
|--------------|--|
| Objective 8 | Obtain ongoing and sufficient resourcing for improved management of the river system. |
| Objective 9 | Collaborate and effectively work together to protect and improve the river system. |
| Objective 10 | Policy and planning protects and enhances the ecological and community benefit and amenity of the river system. |
| Objective 11 | Implement strategies and approaches for managing the river system that are adaptive and based on appropriate knowledge , monitoring and evaluation , with river health reported clearly and regularly. |

Healthy river system

Catchment

Objective 1: Manage the catchment to protect biodiversity, waterways and wetlands.

The Swan Avon Catchment covers approximately 126,000km². Surface water and groundwater from within the catchment flows towards wetlands and waterways and eventually the Derbal Yiragan (Swan) Djarlgarro (Canning) rivers. This connectivity means that activity within the catchment can impact on the health of the river system.

Pollutants, largely generated through human activity within urban, industrial, and agricultural areas, are transported into the river system from sources throughout the catchment and can enter waterways and wetlands through drainage systems and groundwater movement. Pollutants range from excess nutrients to non-nutrient contaminants, such as microplastics, pesticides, metals, litter, pathogens, perfluoroalkyl and polyfluoroalkyl substances (PFAS), and hydrocarbons. Excess nutrients can cause eutrophication, leading to harmful algal blooms and oxygen depletion in the water (see the infographic of nutrient loads entering the river system from the Swan Canning Catchment for the period 2016-2020 on page 25). It is considered more cost effective and practical to improve water quality within the river system by treating pollutants at-source within the catchment and preventing them from entering the river system.

Various activities and land use practices can contribute to poor river system health. Agricultural land uses, including horticulture, animal keeping, and farming, remain significant contributors of nutrients to the river system. The development of new urban and industrial areas can potentially mobilise nutrients, sediment, and other contaminants. Management of construction works (including dewatering) and ongoing site maintenance is important to reduce the transportation of pollutants and sediment to waterways and wetlands.

Continued urban, agricultural and industrial expansion may result in the loss of vegetation within the catchment. Retention of vegetation within the catchment is critical in maintaining river health and water quality, helping to prevent erosion, stabilise foreshores, reduce nutrient entering waterways, provide shade and manage salinity levels. By removing vegetation, critical habitat is lost, resulting in invasion of weeds, loss of biodiversity, increased temperatures and altered hydrology and water balance.

Vegetation clearing can also significantly impact on sediment loads entering the river system. Sediment fills river pools and wetlands, smothers aquatic plants, degrades critical aquatic habitats and reduces water quality. In some parts of the catchment, animal stock can directly access waterways, damaging foreshore vegetation and destabilising riverbanks, causing increased sediment movement into the waterways and wetlands.

Effective catchment management will need to ensure that new developments and current uses and activities are managed in a way that also protects ecosystem functions and retains and enhances natural areas.

The image on the following page shows how water flows from urban environments into waterways and wetlands, and how on-ground activities can impact on water quality.

Strategies

Strategy 1: Update and implement the Swan Canning Water Quality Improvement Plan and Local Water Quality Improvement Plans.

Strategy 2: Identify sources of pollution and implement actions to reduce contaminants (including excess nutrients and organic material, wastewater and microplastics) entering the Swan Canning waterways and wetlands.

Strategy 3: Implement and maintain water sensitive design in new urban and industrial developments, to ensure development and changes in land use and transport systems prevent pollutant export to the river system and maintain the surface water and groundwater balance of Swan Canning waterways and wetlands.

Strategy 4: Develop and implement plans for targeted infrastructure retrofits throughout the catchment to improve water quality, ecological health and amenity.

Strategy 5: Retain natural vegetation and implement on-ground actions, such as revegetation, restoration of waterways and wetlands and retrofitting of drains, to enhance ecological functions and create/extend ecological corridors and stepping stones between habitats throughout the catchment.

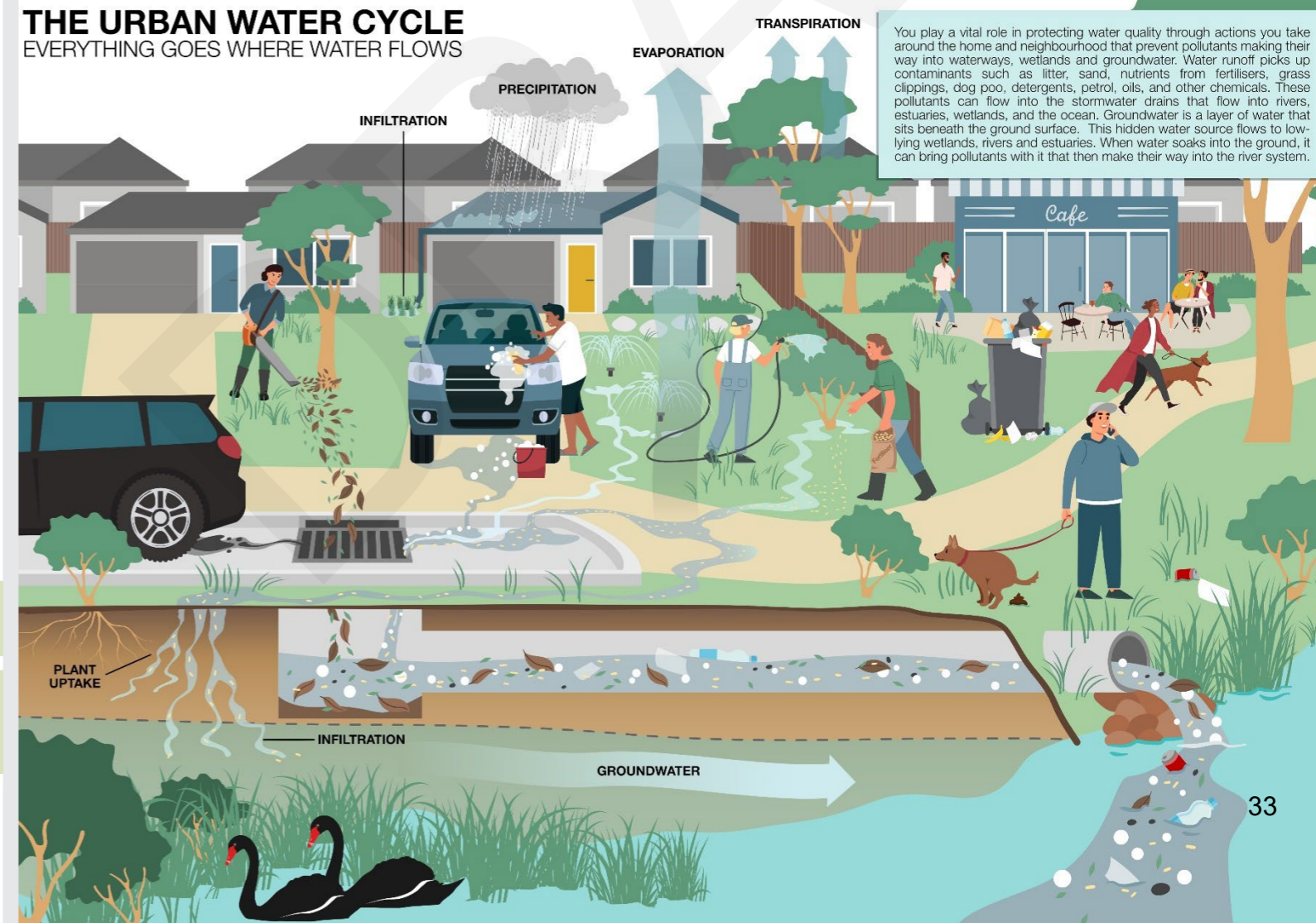
Strategy 6: Prevent sediment mobilisation due to stock entering waterways, vegetation clearing, and from development and building sites.

Strategy 7: Promote and educate on sustainable gardening, land management and development practices in urban and rural areas that protect waterways and improve soil health.

Management targets

- Increase in net canopy cover on public land across the catchment.
- Support planting of at least 5 million local plants on public land and increase planting on private land.
- Engage with 200,000 community members to increase knowledge about protection of the river system.
- Nutrient load targets are met.

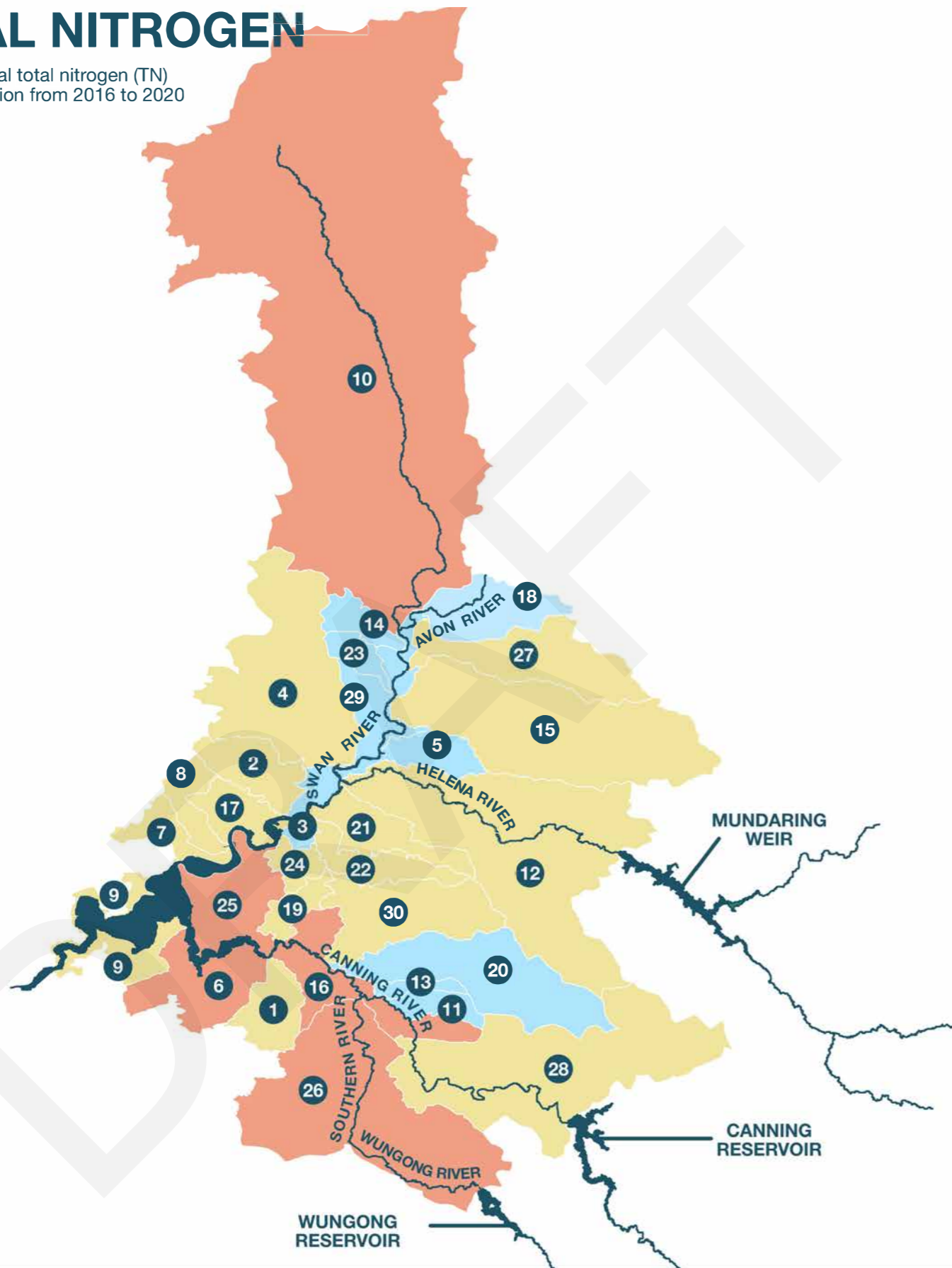
THE URBAN WATER CYCLE EVERYTHING GOES WHERE WATER FLOWS



NUTRIENT LOAD CONTRIBUTIONS OF THE SWAN CANNING CATCHMENTS

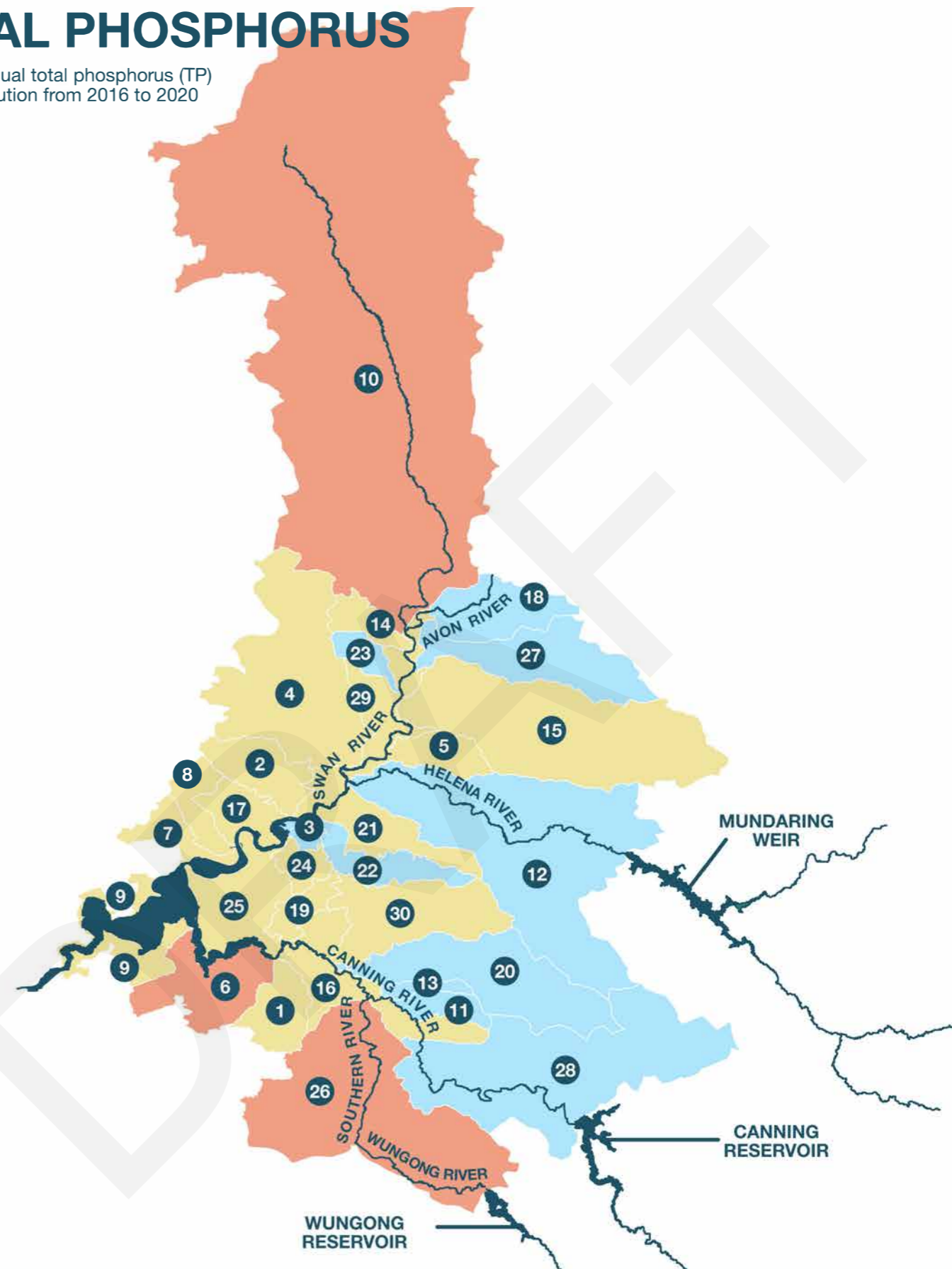
TOTAL NITROGEN

Average annual total nitrogen (TN) load contribution from 2016 to 2020



TOTAL PHOSPHORUS

Average annual total phosphorus (TP) load contribution from 2016 to 2020



Load contribution:

High: >5%
Moderate: 1% to 5%
Low: <1%

Swan Canning catchments:

G = Gauged catchment	1. Bannister Creek (G)	6. Bull Creek (E)
E = Ungauged model estimated catchment	2. Bayswater Brook (G)	7. CBD (E)
	3. Belmont Central (E)	8. Claisebrook Main Drain (E)
	4. Bennett Brook (G)	9. Downstream (E)
	5. Blackadder Creek (E)	10. Ellen Brook (G)

11. Ellis Brook (E)	16. Lower Canning (E)	21. Perth Airport North (E)	26. Southern River (G)
12. Helena River (G)	17. Maylands Main Drain (E)	22. Perth Airport South (E)	27. Susannah Brook (G)
13. Helm Street Drain (E)	18. Millendon (E)	23. Saint Leonards Creek (E)	28. Upper Canning River (G)
14. Henley Brook (E)	19. Mills Street Main Drain (G)	24. South Belmont (G)	29. Upper Swan (E)
15. Jane Brook (G)	20. Munday Bickley (E)	25. South Perth (E)	30. Yule Brook (G)

Water

Objective 2: Manage water quality and quantity to support the river system's ecological and cultural values.

The waterways within the Derbal Yiragan (Swan) Djarlgarro (Canning) river system help sustain life for both nature and people. Climate change is the biggest threat to the health of the waterways, with up to a 50 per cent reduction in freshwater flows predicted by 2050 across the coastal areas and even greater reductions predicted from inland areas.

Community consultation confirmed that Perth residents consider good water quality of key importance when it comes to the value of the river system. Perceptions of good water quality for healthy habitats for animals and plants and for community use, such as swimming and fishing, were considered top priorities for managing the rivers.

Activities within the whole catchment influence water quality. To properly manage these activities, it is vital we monitor the water quality and ecological health of the rivers (see the infographic on water quality of the Swan Canning rivers for the period 2016-2020 on page 26).

The management of water regimes (volume, rate and frequency) is essential to maintaining a healthy ecosystem. In some waterways, such as the Djarlgarro (Canning) River, ecological water flows are managed through the implementation of allocation plans outlining the ecological provisions for the waterways. However, a better understanding of the ecological and cultural water flows for all the river systems' waterways will be required under a drier climate.

Without improvements in water quality and the maintenance of ecological and cultural water flows, conditions in the river system are expected to deteriorate.

Strategies

Strategy 8: Monitor water quality, contaminants and measures of ecological health in the river system and review targets.

Strategy 9: Determine and provide the water regime required to protect ecological and cultural values of Swan Canning waterways, including the provision of water flows and the installation of adaptation measures.

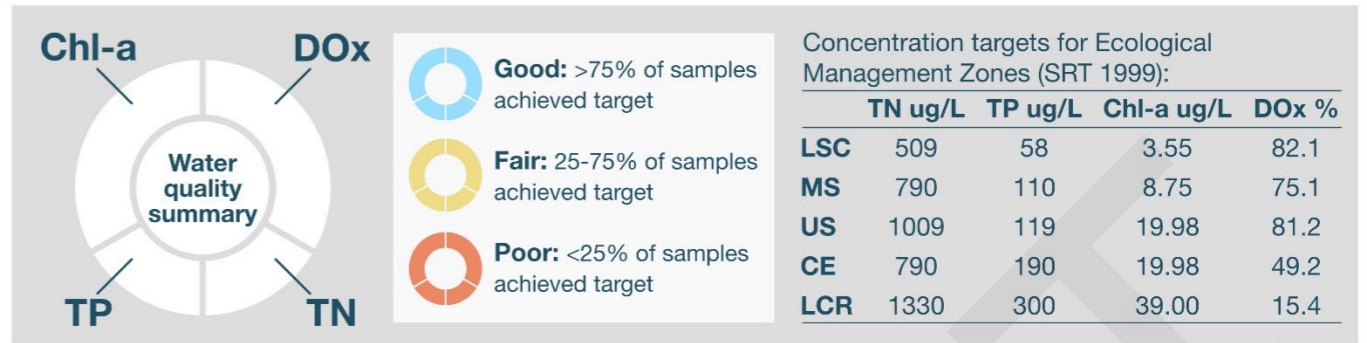
Strategy 10: Improve the accuracy of flow gauging for priority catchments and investigate the feasibility of installing gauging stations in ungauged catchments.

Management targets

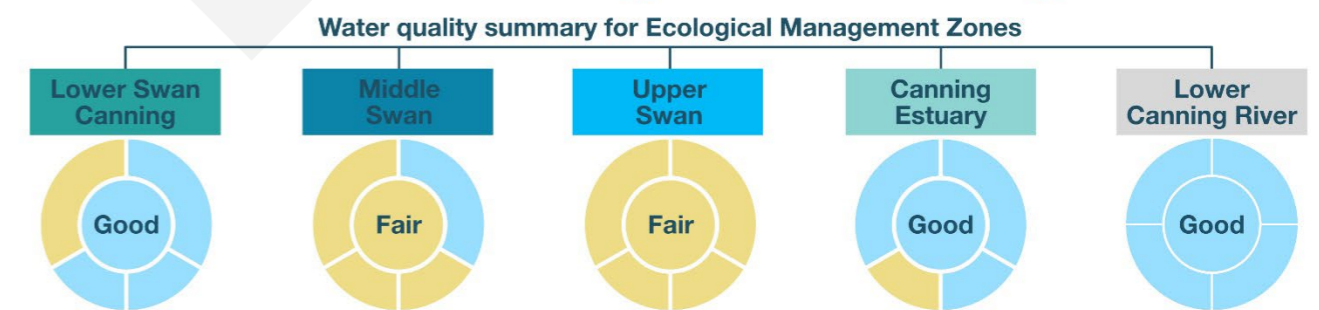
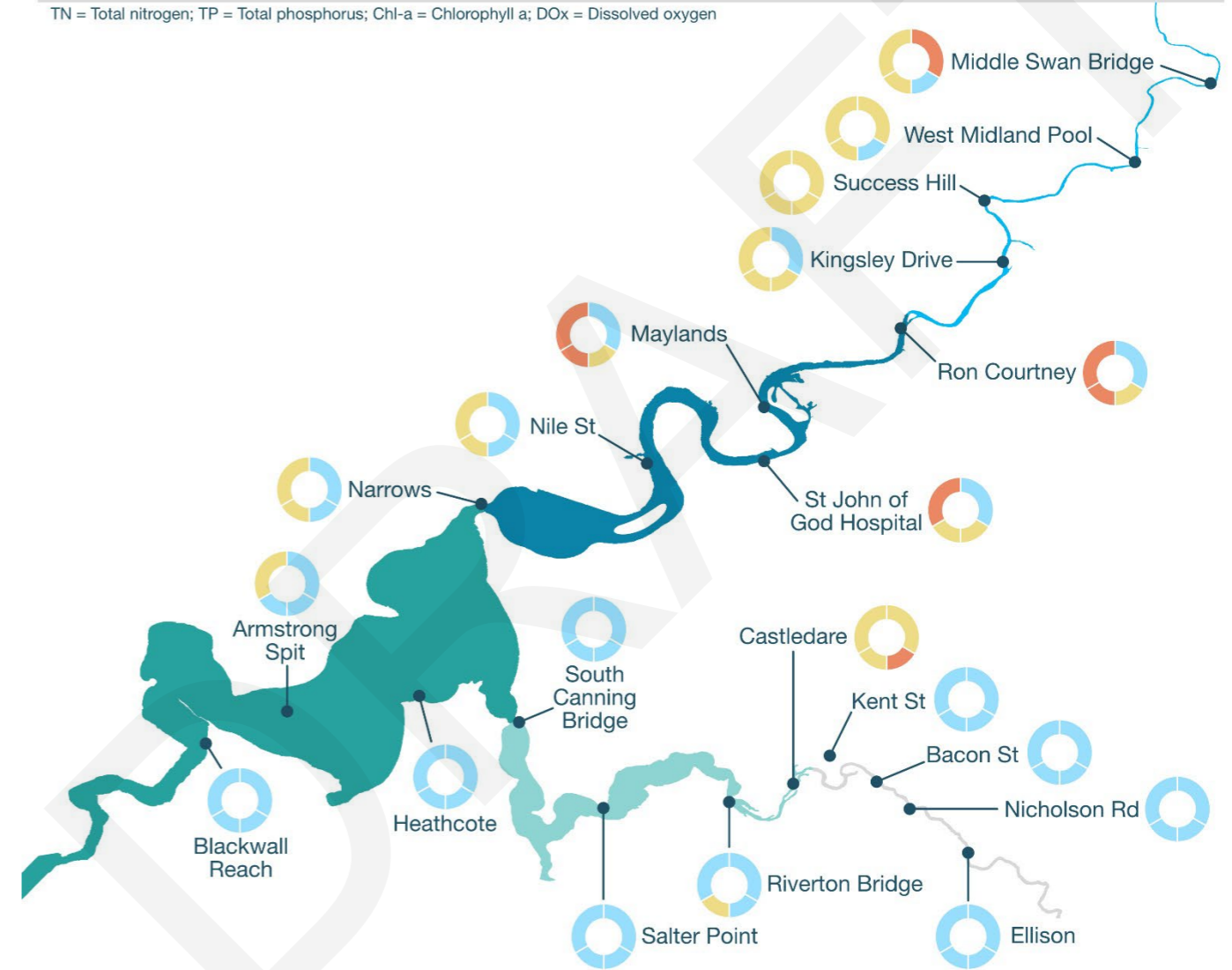
- Cultural and ecological values are protected.
- Nutrient concentration targets are met in the estuary and catchments.
- Non-nutrient contaminants in water, sediment and biota are reduced.

WATER QUALITY SUMMARY

Calculated from surface water quality monitoring in the Swan Canning river system in 2016-2020 (Jan - May)



TN = Total nitrogen; TP = Total phosphorus; Chl-a = Chlorophyll a; DOx = Dissolved oxygen



Biodiversity

Objective 3: Protect and enhance local biodiversity of the river system and build resilience to climate change.

Community consultation found that maintaining good water quality and healthy habitats for flora and fauna was considered the top management priority. The river system is home to an abundant array of aquatic and terrestrial wildlife, including more than 200 species of fish known to inhabit the Riverpark (see the infographics for seagrass and fish communities of the Swan Canning Estuary for the period 2016-2020 on pages 28 and 29).

South-western Australia is internationally recognised as a 'biodiversity hotspot'. It is estimated that of Australia's plant species, 32 per cent are found in the south-west of Western Australia, of which approximately 79 per cent are endemic. However, more than 70 per cent of the original vegetation has now been cleared, posing a major threat to the biodiversity in the region. While the river system is only a small part of the region, vegetation clearing remains of concern.

Legacy contamination, pollution and waste disposal within the river system continue to threaten wildlife. Ingestion and entanglements are often fatal to Riverpark species.

Understanding the biodiversity within the river system is vital for effective management of threats, such as human disturbance, existing and emerging pests and diseases, development pressure, climate change impacts, extreme weather events, degrading foreshores and habitats, aquatic and terrestrial weeds, and declining water quality.

Climate change impacts biodiversity in the Perth region through rising temperatures, decreased rainfall and increased frequency of extreme weather events, leading to habitat loss and altered ecosystems. Species extinction is a major concern. The Intergovernmental Panel on Climate Change predicted that up to 30 per cent of species are at risk if global temperatures rise by 1.5-2.5 degrees. Creating a resilient system should be a priority in river system management. Protecting and enhancing aquatic and terrestrial vegetation and green spaces creates natural carbon sinks, which can help to combat climate change effects.

Healthy oxygen levels within the river system are vital to sustaining biodiversity. Oxygen levels can become critically low due to factors such as decaying organic matter, algal blooms associated with nutrient releases, altered salinity levels causing stratification, and increased temperatures. To combat this, four oxygenation plants, costing \$1.5 million annually, are operated to increase oxygen levels within the Swan and Canning rivers.

Incorporation of nature-positive design that supports ecosystem biodiversity is a priority. In-water habitat structures are currently being trialled to support and improve ecosystem complexity and promote diversity.

Strategies

Strategy 11: Improve understanding of the biodiversity in the river system, the processes that support it and the associated threats, through approaches such as green asset and ecosystem mapping, and improve management of threats by developing cross-boundary, multiple-stakeholder approaches.

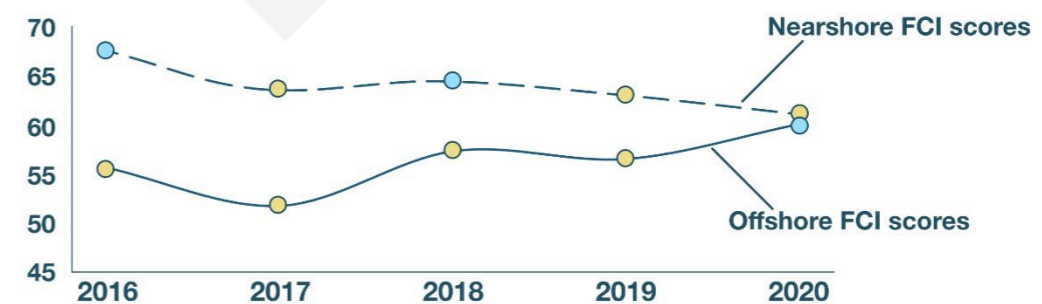
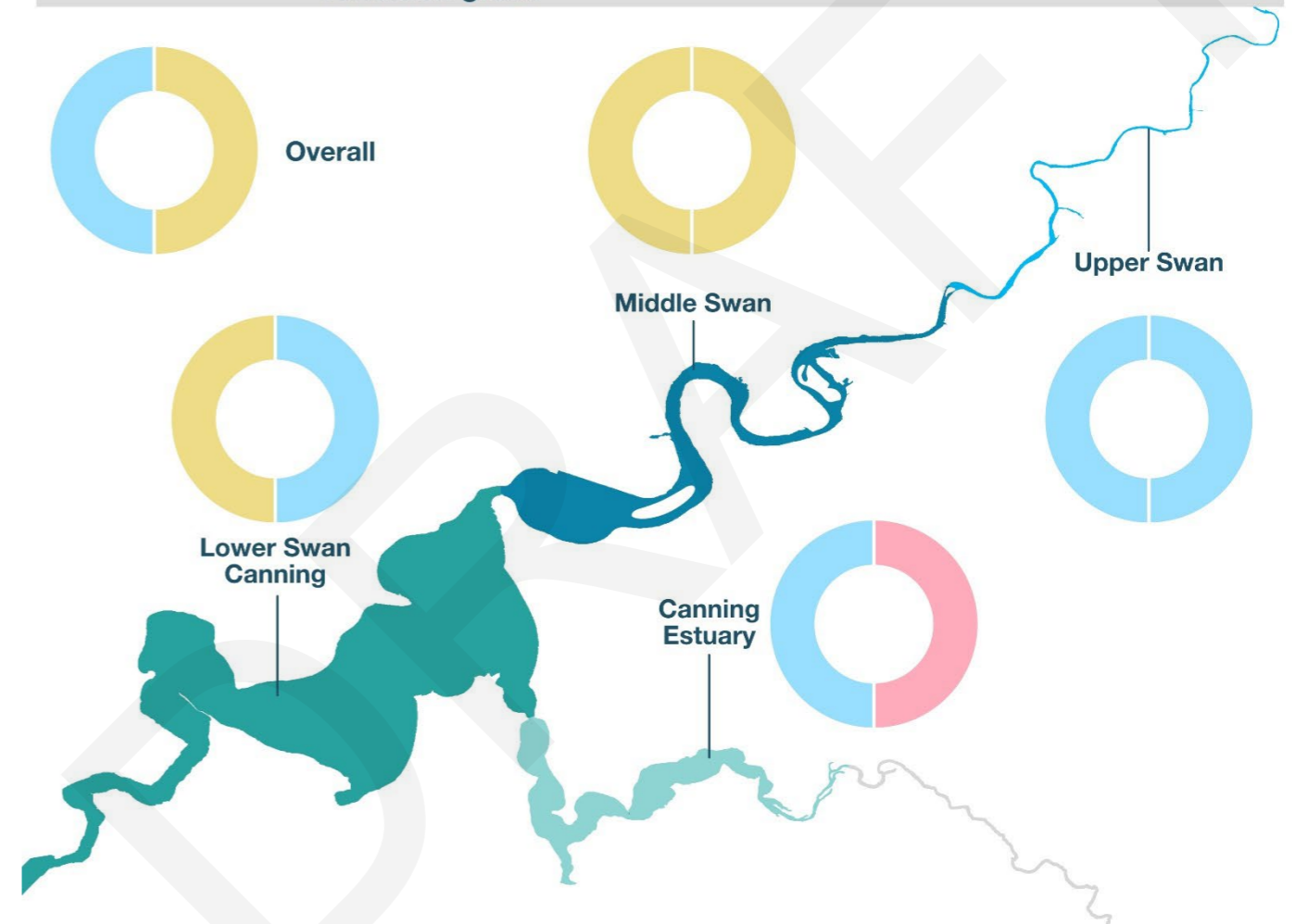
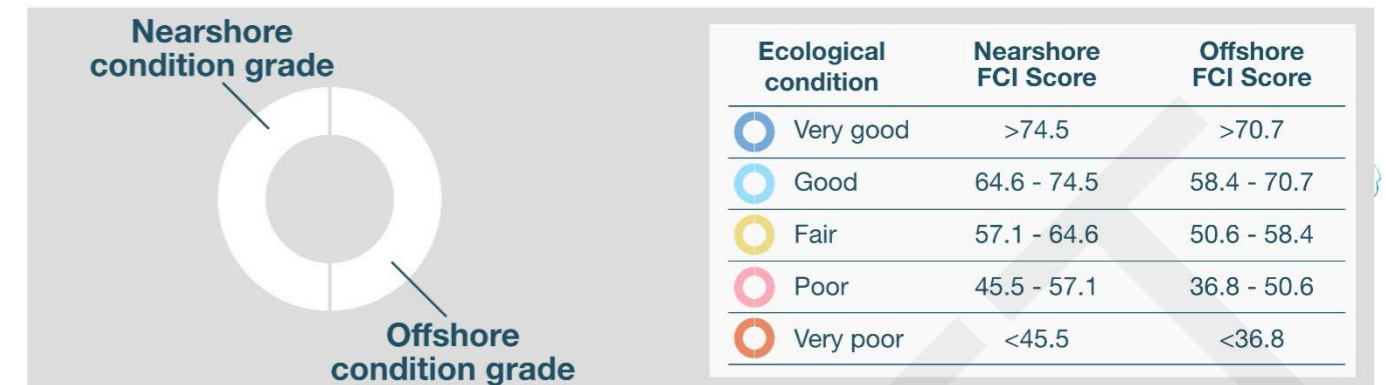
Strategy 12: Retain, enhance and extend critical habitat, wildlife refuges and sanctuary areas for biodiversity in the river system.

Management targets

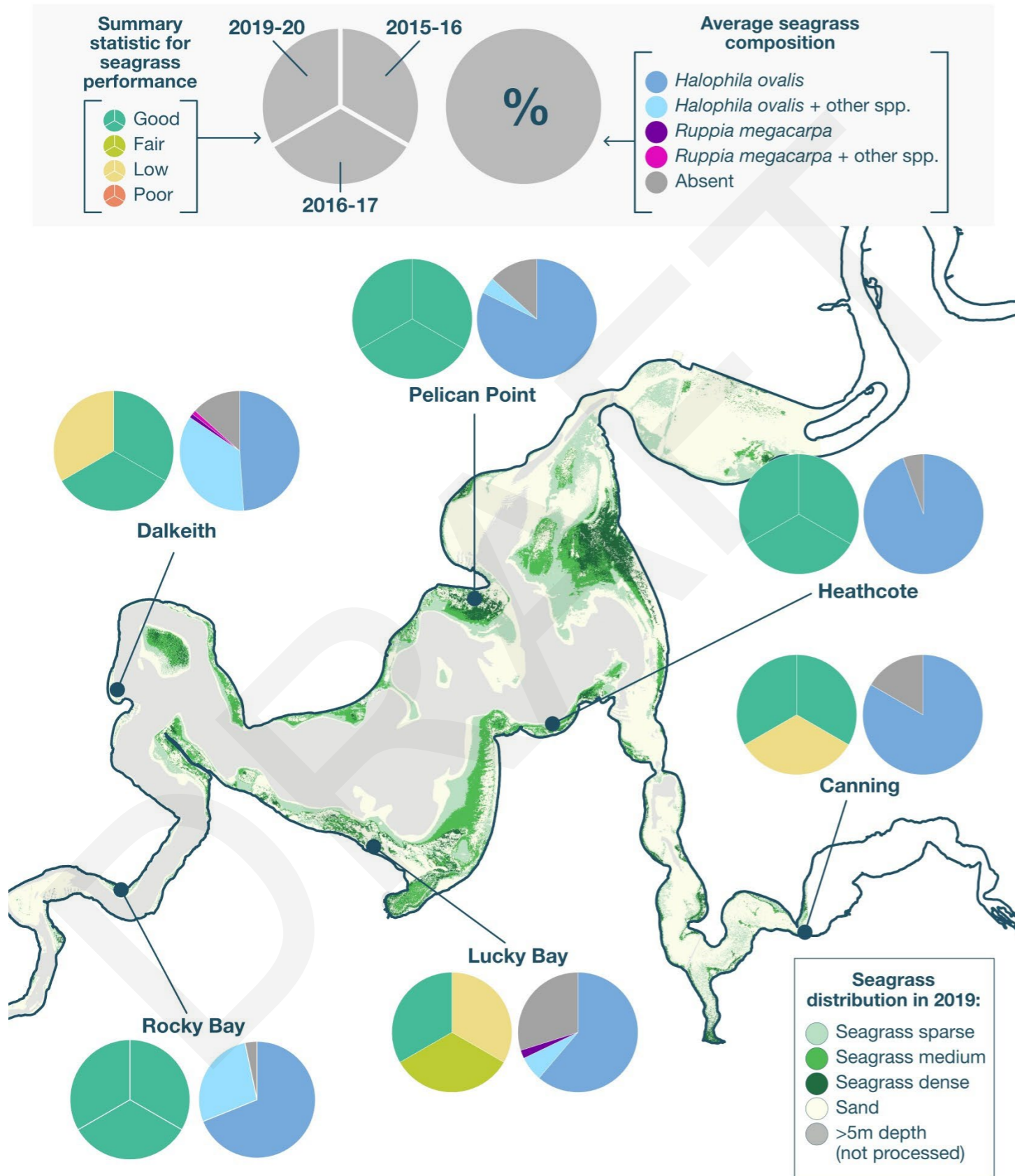
- Fish communities condition grades are maintained or improved.
- Seagrass condition and distribution is maintained or improved.
- No significant (>100 fish) native fish kill events caused by toxic algal blooms, anoxia or pollution events.

FISH COMMUNITIES

Based on Fish Community Index (FCI) monitoring from 2016 - 2020



SEAGRASS



Foreshore

Objective 3: Restore and revegetate foreshores and implement fit-for-purpose foreshore treatments that are maintained and enhanced.

The foreshore refers to the riverbank and nearshore areas of waterways within the Derbal Yiragan (Swan) Djarlgarro (Canning) river system. As the interface between the terrestrial and aquatic environment, foreshores support a variety of ecological processes that are vital for the healthy functioning of streams and rivers.

Community consultation found that most of the community's direct interaction with the river system is through their use of foreshore areas, with 93 per cent of Perth metropolitan river users participating in land-based activities (such as visiting cafes, picnicking and walking).

The Perth community prioritises a balanced approach to foreshore management, valuing natural areas for wildlife appreciation (75 per cent), well-maintained walking trails and river access infrastructure (68 per cent), and parks for picnicking (60 per cent) when it comes to the future management of the Riverpark. However, many built foreshore assets are in poor to very poor condition, requiring over \$163 million over the next 20 years to maintain existing levels of service.

Foreshores face threats from poor historic land use decisions, such as insufficient setbacks, drainage pipes discharging directly into the waterway and clearing of vegetation, as well as current and emerging threats from urban development, climate change, fire management practices, flood, human use, trampling, weeds, river level changes and bushland fragmentation.

To address these issues, best practice foreshore planning is being implemented to strategically prioritise and manage foreshore use, development and foreshore treatment decisions. This must be done collaboratively between land managers and statutory authorities, in consultation with the community, ensuring that assets are being maintained and improved and consistent management practices are applied by all land managers. Engagement with stakeholders, including engineers, environmental officers and landscape architects, to further investigate innovative foreshore treatments that incorporate nature-based solutions should be prioritised.

Strategies

Strategy 13: Understand, communicate and manage impacts of climate change, erosion and inundation, based on risk modelling and mapping.

Strategy 14: Investigate and implement innovative and collaborative approaches to foreshore planning and management and the effective retention and restoration of vegetation in foreshore areas.

Management targets

- The amount and condition of natural vegetation within the Riverpark and other foreshore areas is increased and improved.
- Foreshore spatial plans are prepared and implemented to deliver long term planning solutions for the foreshore.
- At least 10 per cent of the foreshores in the Riverpark are restored, renewed or upgraded.

Healthy people

Lifestyle

Objective 5: Enhance culture, community lifestyle and connection by providing appropriate places in the river system to socialise, recreate and relax.

The river system offers numerous health benefits, including urban cooling functions and flood protection. It also serves as a space for the community to exercise, relax, connect, and recreate. The rivers provide direct access to a variety of on-water and foreshore activities in the heart of Perth, such as fishing, boating, yachting, kayaking, rowing, walking, cycling, and swimming. The river system has intrinsic value due to its natural attributes and spiritual and cultural significance. The historical and cultural significance of the river system is a testament to the rich tapestry of Western Australia's heritage. It continues to be a symbol of the region's past, present, and future. Aboriginal culture and heritage are addressed under the Culture objective.

As the city continues to grow, there is an increasing need to manage community use of the river system, balancing competing recreational and commuting demands and ensuring safe and environmentally appropriate access for all ages and abilities.

According to the 2023-24 community survey, 75 per cent of respondents agreed that walking and cycling access along the rivers was important, while only 14 per cent agreed with increased residential development along the rivers. This indicates that increasing public ownership and connectivity along the rivers is a priority. As the population grows, it will be crucial to ensure that development and use are appropriately managed to enhance and protect amenity, culture and heritage while also protecting the environmental values of the river system.

Strategies

Strategy 15: Improve community access, enjoyment and connectivity through provision of strategically located facilities and public spaces.

Strategy 16: Support sustainable tourism, commercial offerings and riverside events that enhance the community's use and enjoyment of the river.

Strategy 17: Ensure river transport and on-water activities, including an enhanced ferry service, are planned and coordinated.

Strategy 18: Retain, conserve and responsibly manage significant historic heritage places within the river system.

Management targets

- Community satisfaction of water quality for swimming increases.
- Average visitor satisfaction for the Riverpark increases and meets or exceeds 85 per cent.
- Increase the number of trails and interpretation nodes and support appropriate numbers of commercial operators.
- Water quality is safe for recreational use.

Culture

Objective 6: Strengthen respect of and care for the river system by recognising, conserving and sharing Noongar and other Aboriginal culture and knowledge and retaining and conserving Aboriginal sites and places.

The Derbal Yiragan (Swan) Djarlgarro (Canning) river system is rich in Noongar and other Aboriginal heritage, with over 450 identified sites and places, including the rivers themselves. These sites encompass ancestral birthing, burial, hunting and gathering, camping, and fishing sites that are still visited by Noongar people today. The cultural and historical significance of the river system is of great importance, and mapping is a crucial tool for enhancing our understanding.

Noongar culture and heritage knowledge and customary activities provide invaluable insights into Country and how to protect it. It is important this knowledge be recognised and respected. The transmission of these customary activities to future generations is of paramount importance. Noongar people have a cultural responsibility to care for the waterways and wetlands, maintaining a custodial relationship with the waterways and wetlands, much like their ancestors did in the past.

Access to the river system is vital for Noongar people to carry out customary activities and fulfil cultural obligations. Furthermore, food sources and medicines derived from the river system play a significant role in Noongar people's cultural activities and healing processes.

Strategies

Strategy 19: Identify, retain and conserve Aboriginal sites and places.

Strategy 20: Actively promote customary activities and caring for Country and incorporate Noongar and other Aboriginal culture and knowledge into management practices.

Strategy 21: Encourage and promote Noongar tourism, commercial operations, employment and economic opportunities around the river system.

Management targets

- Riverpark is mapped for cultural heritage sites, places and values.
- Appropriate knowledge holders are invited to be involved in all major projects.

Connection to nature

Objective 7: Connect people with nature in the river system.

Connection to nature is widely recognised for its significant benefits to human mental and physical health and wellbeing. Community consultation found that 76 per cent strongly agreed that the river system benefits the community by being a place of sanctuary for plants and wildlife, and 68 per cent of people strongly agreed that they would like the river system to connect them to nature. This indicates a demand for opportunities that allow the community to interact with the river system in a manner that preserves and enhances its natural state, while also managing threats from overuse and climate change.

The responsibility of caring for the waterways is a collective one, making community education on the management and care of rivers, wetlands, foreshores, and catchments crucial. We need to foster a sense of stewardship and be the voice for nature. There are many community-led groups and organisations throughout the catchment that are actively involved in river system protection. It will be important to continue to support, coordinate and to provide opportunities for community members to engage in river system protection. River Guardians provides a coordinated platform for the community to engage with behaviour change programs that include river protection actions and information collection and sharing. For example, the River Guardians' Dolphin Watch Program has been crucial in monitoring the health of the rivers' resident dolphin population. This provides river managers with more information and educates the community on key issues within the river system, such as plastic contamination and wildlife ingestion and entanglement (see the information related to plastic contamination and dolphin entanglement on the following page).

Expanding the size of vegetated areas within foreshore reserves not only improves the health of the rivers and tributaries but also gives people a sense of being in nature. However, the lack of continuity of land ownership among different local governments, State and Federal Government agencies, and private landowners makes it challenging to provide consistent management that prioritises natural areas for community connection.

Education through programs and provision of consistent, strategic guidance for all land managers and the community will be crucial to creating enhanced natural spaces in which the community can experience nature in a way that does not negatively impact on the ecological health of the river system.

Strategies

Strategy 22: Create, protect and enhance spaces that enable the community to connect with nature and the ecological values of the river system, particularly within the Riverpark.

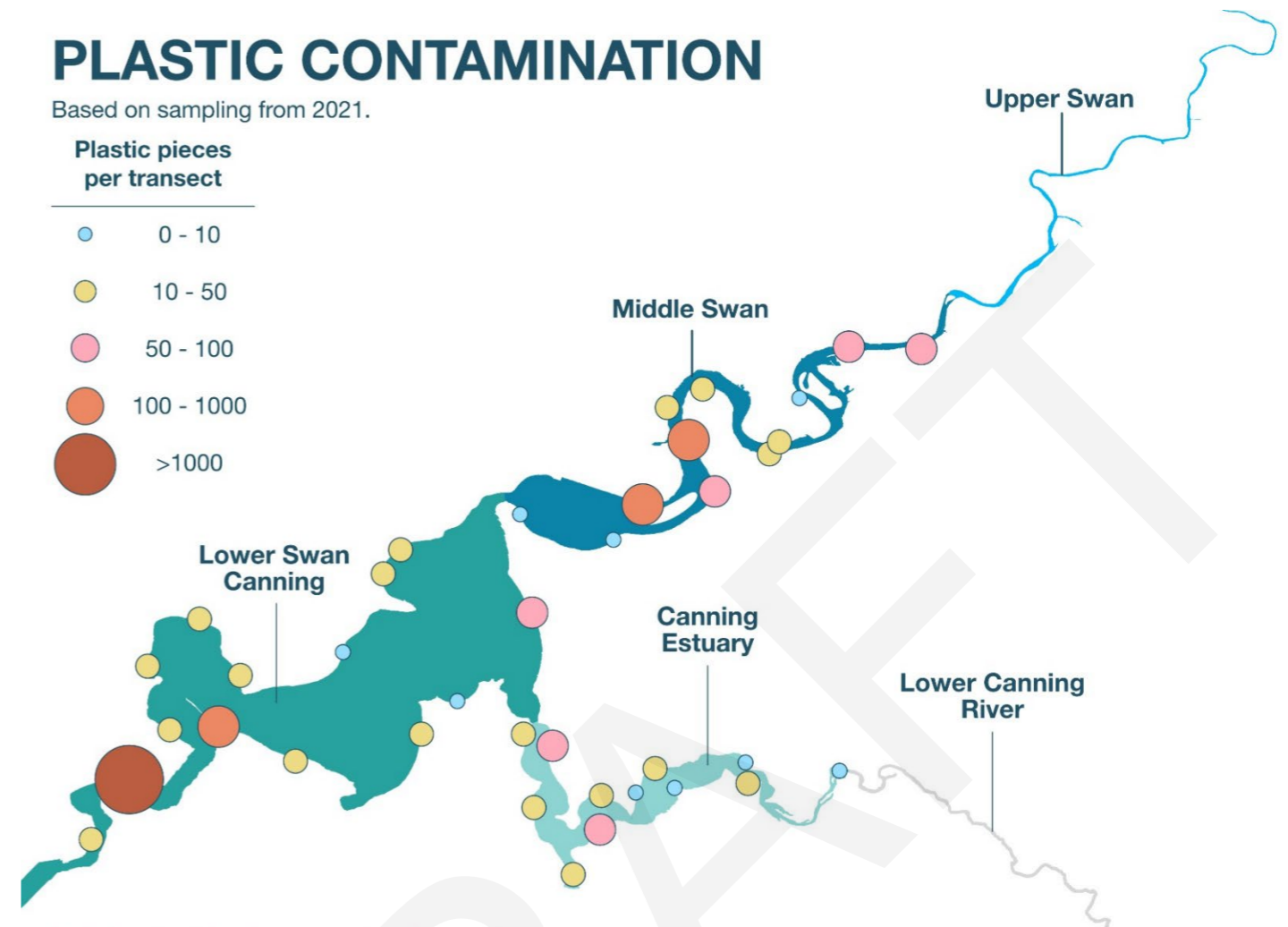
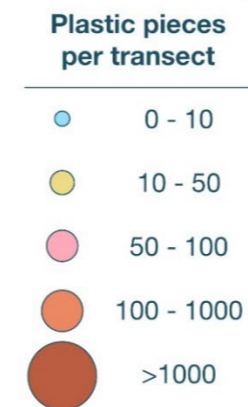
Strategy 23: Implement education and engagement initiatives to increase appreciation and understanding of the river system values and threats, and to increase the adoption of river protection behaviours.

Management targets

- The community feel increasingly connected to nature.
- Increase the number of River Guardian members.

PLASTIC CONTAMINATION

Based on sampling from 2021.



Dolphin deaths due to entanglement:



Enablers

Sustainable resourcing

Objective 8: Obtain ongoing and sufficient resourcing for improved management of the river system.

Protection and management of the river system relies on adequate resourcing. A more strategic approach to identifying funding gaps and needs, involving all stakeholders, will support improved restoration, monitoring, research and compliance activities.

Significant benefits to river system management and protection are derived through the substantial involvement of natural resource management organisations and volunteer community groups in implementing on-ground actions. Access to adequate resources enables these groups to strategically plan the works required to protect the river system to the necessary standard and sustain their membership.

Strategies

Strategy 24: Prepare an investment plan for protection of the river system.

Strategy 25: Develop a targeted research strategy that addresses critical information gaps for the river system, including the impacts of climate change, that supports partnerships and co-investment.

Management target

- Sustainable funding supports river system protection and management.

Collaboration

Objective 9: Collaborate and effectively work together to protect and improve the river system.

Planning and management of the river system is a collective effort involving the Planning and management of the river system is a collective effort involving the community, Aboriginal partners, natural resource management (NRM) organisations, local governments, State Government agencies, other land managers and volunteers. However, the responsibilities for river management and stakeholder priorities need to be better defined and communicated to break down barriers and work towards a shared vision.

Effective collaboration and coordination are the keys to achieving the best outcomes for river protection. This requires greater support and strategic direction from State and local government for NRM organisations and community groups, who are essential for effective on-ground management.

Engagement with the community, Aboriginal partners, and stakeholders, as well as education through events and forums, provide opportunities for knowledge sharing and networking. These platforms also promote active community involvement in river system protection, such as volunteering with NRM groups and participating in River Guardians projects. This collective effort is crucial for the long-term sustainability and protection of our precious river system. Education is an essential element of many of the strategies in the RPS.

Strategies

Strategy 26: Develop improved ways to work together in river management and planning, including improved communication, networks and knowledge sharing.

Strategy 27: Increase Noongar participation in the management of the river system and build strong partnerships with Aboriginal corporations.

Strategy 28: Develop RPS implementation plans with stakeholders, including land managers, at a river reach scale, and biennially report on progress.

Strategy 29: Engage openly and constructively with Traditional Owners, government agencies and service providers, volunteers, proponents, developers, operators and the community to ensure sustainable use, protection and improvement of the river system.

Strategy 30: Establish a collaborative framework with water and environment agencies for improved catchment and drainage outcomes for the river system.

Management targets

- 70 per cent of Perth residents are satisfied with the management of the river system.
- Traditional Owners are increasingly involved in decision making and management of waterways on their Country.

Policy and planning

Objective 10: Policy and planning protects and enhances the ecological and community benefits and amenity of the river system.

Stakeholders are seeking leadership, a clear regulatory framework that is enforced to ensure compliance, and further support from the State Government on emerging issues such as climate change. Strategic planning is required to recognise community expectations around the future use of an area, provide clear guidance on good design outcomes and investment, streamline assessment processes and assist with budgeting.

Multiple agencies are responsible for planning and decision making that impacts the river system. Similarly, there are many different land managers within the Riverpark. Therefore, a coordinated and consistent approach supported by information on the decision-making framework, is crucial.

Local governments, the primary land managers within the Riverpark, have identified a lack of resources and planning guidance as a barrier to developing and implementing long term spatial planning solutions. In addition, stakeholders identified that additional policy and guidance on the following matters could also be beneficial—acceptable development in the Swan Canning development control area, estuary level rise risk identification and management, foreshore edge treatments (especially those that can adapt to more frequent inundation), level of service for foreshore infrastructure, foreshore access network expectations, urban greening and preservation of canopy on both public and private land, and wetland buffers. These considerations are vital for the sustainable management and protection of the river system. Locality planning and master planning will assist in providing this guidance.

Currently, 94.9 per cent of the reserved river foreshores are vested and managed for public benefit. However, predicted sea and estuary level rises pose a significant risk to many recreational areas along the foreshores. Ensuring that foreshores are managed to combat these threats for the benefit of the public will be important to ongoing management.

A management programme under the RPS that defines key planning principles will be established to help provide guidance to stakeholders.

Strategies

Strategy 31: Continue to secure appropriate foreshore reserves in public ownership, ensure foreshore reserves are appropriately managed, and undertake long-term planning to increase the provision of Parks and Recreation reserve adjacent to the waterway.

Strategy 32: Implement and continuously improve legislation, policy, guidance and land use planning to ensure adequate provision for foreshore areas, ecological corridors and wetland buffers, and protection of flood function, ecological health, amenity and community connection to the river system.

Management targets

- Review and update policy and regulation to ensure their ongoing suitability and effectiveness.
- Increase the amount of publicly owned foreshore reserves.
- Increase area of foreshore reserved for Parks and Recreation under the Metropolitan Region Scheme.

Applied knowledge and evaluation

Objective 11: Implement strategies and approaches for managing the river system that are adaptive and based on appropriate knowledge, monitoring and evaluation, with river health reported clearly and regularly.

Targeted research plays a crucial role in informing management and planning decisions. Enhancing the communication of research outcomes and data sharing can significantly improve planning and management of the river system, empowering decision-makers, management organisations, and the community.

Routine water quality monitoring is currently conducted weekly in the estuary and fortnightly in the catchment. Water quality reports are produced to help inform management and stakeholders and provide health warnings to the community. Key indicators of ecological health, such as fish communities and seagrass condition, are also routinely monitored. Existing and future measures of water quality and ecosystem health, developed through research and partnerships, require significant and ongoing investment.

Ecological assessments are conducted at key locations in the Canning River to evaluate the effectiveness of water releases.

The Swan Canning Estuarine Response Model, developed in collaboration with research partners, is a significant tool for informing water quality management. It provides insights into the potential impacts of climate change on water quality and ecosystems, thereby aiding in the development of effective mitigation strategies.

Other measures will be considered or developed to report against this strategy to help meet management targets outlined within the healthy people and healthy river system values, such as vegetation coverage and foreshore condition.

Maintaining and identifying current and new practices in monitoring and information sharing is a priority in river system management. These practices should be regularly reviewed to ensure that information produced meets management needs and community expectations.

Strategies

Strategy 33: Improve information systems to improve sharing of data and research to inform planners, decision makers and the community.

Strategy 34: Provide high quality, timely and appropriate advice to all stakeholders, including statutory authorities and the community.

Strategy 35: Regularly review approaches to monitoring and evaluation to ensure they are appropriate and adequately resourced to meet information needs for reporting against the objectives of this strategy.

Strategy 36: Report and share water quality and biodiversity outcomes.

Strategy 37: Encourage participation in citizen science, research and monitoring.

Management targets

- Regular public reporting on water quality and ecological health.
- Increase the number of Dolphin Watch volunteers.

Implementation and evaluation

Implementation of the strategy is supported by the ongoing evaluation of the management targets set for each value and enabler. Management targets have been developed to assess the overall efficacy of strategies and the advancement towards fulfilling the objectives. Strategies often contribute to multiple management targets and each goal will have one indicator to periodically measure progress towards the goal. This facilitates tracking and evaluating the strategy over time, providing insights for adaptive management opportunities.

To gather information on the implementation of the 37 strategies, at least one metric is being developed for each strategy, which will form the basis of the monitoring and evaluation framework.

Over the next decade, regular reporting will offer transparency about what is being delivered and will track progress towards achieving the strategy's objectives. Reviews will be conducted after five and ten years to evaluate effectiveness of the strategy. Biennial reports will also be compiled using data collected during the implementation of the overarching strategy and associated implementation plans. The reported information will be publicly available.

In consultation stakeholders, shorter term implementation plans will be developed by DBCA on behalf of the Swan River Trust to detail the management actions necessary for executing the overarching strategy, their optimal locations in the landscape, and their timelines.

The implementation plans will outline the roles, responsibilities, and resources for the management actions, marking the next step towards our collective vision of 'A healthy, thriving river system for nature and people, to be cared for and enjoyed as the heart of our community'.

Efforts to improve the management of water quality and quantity, biodiversity, foreshores, and catchments to deliver lifestyle, culture, and connection to nature values will be increased through the implementation plans. The plans will be prepared at a river reach scale to enable numerous stakeholders to collaborate in a practical and efficient manner for the benefit of the Derbal Yiragan (Swan) Djarlgarro (Canning) river system. Working at a river reach scale will enable more stakeholders to collectively share, measure, track, and demonstrate progress towards achieving the strategy. Implementation working groups will be established, including key delivery partners such as State and local government, Noongar Traditional Owners, and natural resource management groups.

LEGISLATION APPLICATION TO THE RIVER SYSTEM



River reserve



Riverpark



Development Control Area (DCA)



Catchment

Swan and Canning Rivers Management Act 2006

- Ensures the protection of the ecological and community benefits and amenity of the Riverpark.
- Establishes the Swan River Trust as the vesting body for the Swan Canning Riverpark and an advisory body to the Minister for Environment that provides high-level, independent advice on the protection of the River reserve and related developments.
- Defines the boundaries of the River reserve, Riverpark, development control area (DCA) and Swan Canning Catchment.
- Outlines the management responsibilities of the Riverpark, including the granting of leases over the River reserve.
- Ensures joint management of the Riverpark shoreline and enables works to provide protection and erosion control for riverbanks.
- Regulates works, acts and activities that are proposed within the Swan Canning Riverpark and development control area through licences agreements and permits.
- Approves and provides the regulatory framework for development within the Swan Canning development control area.
- Enables the development of strategic documents that establish coordinated management arrangements necessary for the protection and enhancement of the ecological and community benefits and amenity of the Riverpark, such as the River Protection Strategy and Management Programmes.



Biodiversity Conservation Act 2016

- Conserves and protects WA's biodiversity, including native and specially protected species and threatened ecological communities, as well as listing critical habitats for conservation.
- Enables the development of biodiversity management programmes to provide for the conservation, protection and management of native species, ecological communities, and critical habitats.
- Regulates wildlife interactions and disturbance, including establishing separation distances from dolphins.

River reserve (marine fauna)

Threatened Ecological Communities throughout the Riverpark, Swan Canning development control area, Swan Canning Catchment



Climate Change Act (not yet passed)

- Requires government to set greenhouse gas emissions reduction targets, report annually to Parliament about Western Australia's progress against emissions reduction targets and develop policies and plans to support achievement of targets and enhance climate resilience.



Conservation and Land Management Act 1984

- Establishes a body to which the State's Terrestrial Reserves and Marine Parks and Reserves are vested in (Conservation Commission of WA and Marine Parks Commission of WA, respectively).
- Outlines the management responsibilities of the State's Terrestrial and Marine Parks and Reserves, including the access and leasing of land, and allows this land to be jointly managed with Traditional Owners.
- Ensures the development of policies to preserve natural environments of the State, the provision of facilities for the enjoyment of those environments by the community, the promotion of appreciation for plants and animals and natural environments, and ensures the Minister for Environment is advised on these issues.
- Enables management plans for terrestrial parks and reserves to be developed for the Minister for Environment, including guidelines for monitoring the implementation of those plans.

Pelican Point Nature Reserve, Matilda Bay Reserve, Canning River Regional Park, Walyunga National Park, Swan Estuary Marine Park (Alfred Cove, Pelican Point and Milyu)



Contaminated Sites Act 2003

- Regulates the identification, reporting, classification and management of contaminated sites.
- Provides technical advice to land use planning authorities to support the management of acid sulfate soils.

Contaminated sites

Acid Sulfate Soils risk areas



Environmental Protection Act 1986

- Protects the environment through the regulation of single-use plastics, unauthorised discharges or emissions, and responses to serious pollution incidents.
- Regulates the clearing of native vegetation through permits.
- Regulates prescribed premises through works approvals and licences.
- Provides independent advice to Government on environmental matters.
- Enables statutory (Environmental Protection Policies) and non-statutory (State Environmental Protection Policies) policies to protect the environment to be developed.
- Allows environmental impact assessments to be conducted.
- Enables compliance with conditions for Ministerial approvals to be monitored.



Pollution of Waters by Oil and Noxious Substances Act 1987

- Protects the environment from and manages hazards resulting from oil pollution.



Soil and Land Conservation Act 1945

- Prevents and mitigates land and water degradation due to soil erosion, salinity, eutrophication, flooding and the removal or deterioration of natural or introduced vegetation.



Waterways Conservation Act 1976

- Enables the declaration of areas as Management Areas, such as the Avon River Management Area, to ensure the conservation, maintenance and management of those areas.

Avon River Management Area (within the Swan Canning Catchment)



SERVICES, INFRASTRUCTURE & INDUSTRY REGULATION

Australian Maritime Safety Authority Act 1990

- Establishes Australia's national regulatory body for maritime safety that promotes the safety and protection of our marine environment.
- Provides certificates of surveys for domestic commercial vessels.



Jetties Act 1926

- Regulates the use of jetties through licences.



Main Roads Act 1930

- Makes provisions for the construction, maintenance, and supervision of bridges, highways, main roads, secondary roads and other roads, including their shared and cycle paths, to ensure that the road network safely links goods, people and places, facilitates industrial, commercial and business development, and enables efficient access to other modes of transport.
- Outlines the responsibilities for the management of all highways and main roads, including freeways and bridges, as well as roads that are not highways and main roads, including rail bridges.

The State's network of highways and main roads, including shared paths, cycle paths and similar paths that form part of that network over, in or adjacent to the River reserve, Riverpark, Swan Canning development control area or throughout the Swan Canning Catchment. Kwinana Freeway is a prominent example.



Public Transport Authority Act 2003

- Ensures the provision of public transport, including ferries.



Public Health Act 2016 / Health Act 1911

- Provides public health advice on issues potentially affecting water quality such as algal blooms, and contaminated sites.



Shipping and Pilotage Act 1967

- Enables declaration of boat harbours, mooring control areas, ports.



Western Australian Marine Act 1982

- Outlines the responsibilities for marine safety (in conjunction with the Australian Maritime Safety Authority).
- Outlines the responsibilities for coastal and estuarine facilities.
- Regulates the installation, removal and use of private moorings, as well as courtesy, emergency, rental and recreational or commercial moorings, including the administration of mooring licences and the associated waiting list.



Western Australian Tourism Commission Act 1983

- Establishes a Western Australian Tourism Commission responsible for promoting Western Australia as an extraordinary holiday and business event destination.
- Outlines the rules for developing, attracting and promoting major sporting, arts, cultural and business events; and supporting the development of significant tourism infrastructure and projects.
- Enables the WA Tourism Commission to act as an agent for any person engaged in the provision of travel or tourism facilities.
- Enables the provision of grants or loans to any person, local government or authority for the purposes of tourism.



Water Corporations Act 1995

- Establishes corporations with the function of providing water services (water supply, sewerage, irrigation or drainage services).
- Ensures water corporations can manage Western Australia's drinking water supplies to provide a safe, high-quality product that consistently meets Australian Drinking Water Guidelines and other consumer and regulatory standards i.e. treat, store and distribute drinking water, as well as manage wastewater i.e. collect, store, treat and dispose of wastewater.



Water Services Act 2012

- Regulates water service providers through the administration of licences.



RESOURCE MANAGEMENT

Agricultural Produce Commission Act 1988

- Guides the sustainability and profitability of the State's agriculture, food and fibre sectors.
- Encourages appropriate land, irrigation, and fertiliser practices.



Biosecurity and Agricultural Management Act 2007

- Manages biosecurity risks associated with serious noxious weeds in Western Australia, through declared plants policies and regulations and by providing research and technical advice on weed issues (Invasive Species Program).



Fish Resources Management Act 1994

- Controls invasive / noxious fish species.



Metropolitan Water Supply, Sewerage, and Drainage Act 1909

- Protects the State's drinking water resources from contamination.
- Informs the allocation of the State's water resources and ensures there is an adequate supply of surface water and groundwater to meet the needs of the community and the environment, now and in the future.



Mining Act 1978

- Encourages investment in resource exploitation.
- Regulates extractive industries.
- Ensures an equitable and secure titles system for mining, petroleum and geothermal industries.
- Is subject to the Environmental Protection Act 1986 to ensure best environmental management is promoted through environmental regulatory and policy services.

There are several exploration and mining tenements across land in the upper reaches of the Swan and Canning rivers and geothermal resources underlying the Swan Coastal Plain.

Rights in Water and Irrigation Act 1914

- Regulates the taking of surface water and groundwater through licences.



Water Agencies (Powers) Act 1984

- The lead legislation of WA's six water resource management Acts (the other Acts being: Country Areas Water Supply Act 1947, Metropolitan Arterial Drainage Act 1982, Metropolitan Water Supply, Sewerage, and Drainage Act 1909, Rights in Water and Irrigation Act 1914, and the Waterways Conservation Act 1976).
- Provides the framework for the measurement, protection, allocation and regulation of water resources in WA.
- Outlines the management responsibilities of the State's groundwater and surface water resources.
- Regulates the management of waterways, drains and local water bodies.



PLANNING, DEVELOPMENT AND LAND MANAGEMENT

Land Administration Act 1997

- Ensures the care, control and management of the Parks and Recreation reserve and other public reserves as well as enabling those land managers the power to lease, sub-lease or licence that land in line with that reserve purpose.



Local Government Act 1995

- Ensures that community facilities are provided and maintained.
- Enables the management of commercial, residential and industrial premises.
- Enables the creation of local laws that concern public health, such as monitoring or management of human health issues, including noise pollution, water quality in local swimming beaches and mosquito management.



Metropolitan Redevelopment Act 2011

- Enables the Minister (for Lands?) to recommended redevelopment areas to be declared.
- Establishes a state agency with planning, development control, land acquisition and disposal and other redevelopment projects in respect of redevelopment areas.

Elizabeth Quay, Riverside, East Perth Power Station site, Wungong Urban Water project area, and Midland Redevelopment Area (Helena River)



Planning and Development Act 2005

- The lead legislation for land use planning and development in WA.
- Establishes a statutory authority that coordinates planning for future land use (the Western Australian Planning Commission).
- Enables the development and maintenance of State Planning Policies, which provides a policy framework to ensure that planning, land use and development maintain and enhance the health, amenity and landscape values of the river.
- Regulates the way in which communities can be built through developing and implementing policy and strategic plans.
- Ensures strategic planning for urban, rural and regional land use planning and land development matters.
- Supports integrated planning and coordinates the development and delivery of land supply, affordable housing, and infrastructure to ensure well-planned and connected communities, particularly in the regional areas of the State.
- Ensures that public and private land is used appropriately and consistently, including location of industry, commerce, residential services, community facilities and necessary infrastructure.
- Approves planning, subdivision and development applications.
- Administers the Metropolitan Region Improvement Fund that can and is used to acquire land for public purposes, including foreshore reserves and parks, and Bush Forever sites. Land acquired through the fund may be vested with various management authorities, depending on the purposes for which the land was acquired.



CULTURAL HERITAGE

Aboriginal Heritage Act 1972 (WA)

- Improves service delivery and facilitates developing policy and programs that deliver sustainable economic, environmental and social benefits to Aboriginal communities.
- Ensures the public and private sectors and the community are advised on the management of Aboriginal heritage.
- Maintains a Register of Aboriginal Sites.
- Helps Aboriginal families and native title parties access information that may help them in reuniting families or demonstrating their connections to Country.
- Ensures developers undertake engagement with Aboriginal people, including building this into development planning processes where required.

Registered Aboriginal sites and places



Heritage Act 2018

- Establishes the Heritage Council to assess and document places of cultural heritage significance.
- Ensures registered places of cultural heritage significance are preserved.
- Encourages the conservation of places with cultural heritage significance.
- Enables the provision of funding to help with conservation planning and conservation works on Heritage Places.

Heritage places listed in the State Register of Heritage Places

