GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

SWAN CANNING RIVERPARK

SWAN RIVER TRUST

Swan Canning River Protection Strategy

PROGRESS REPORT 2019

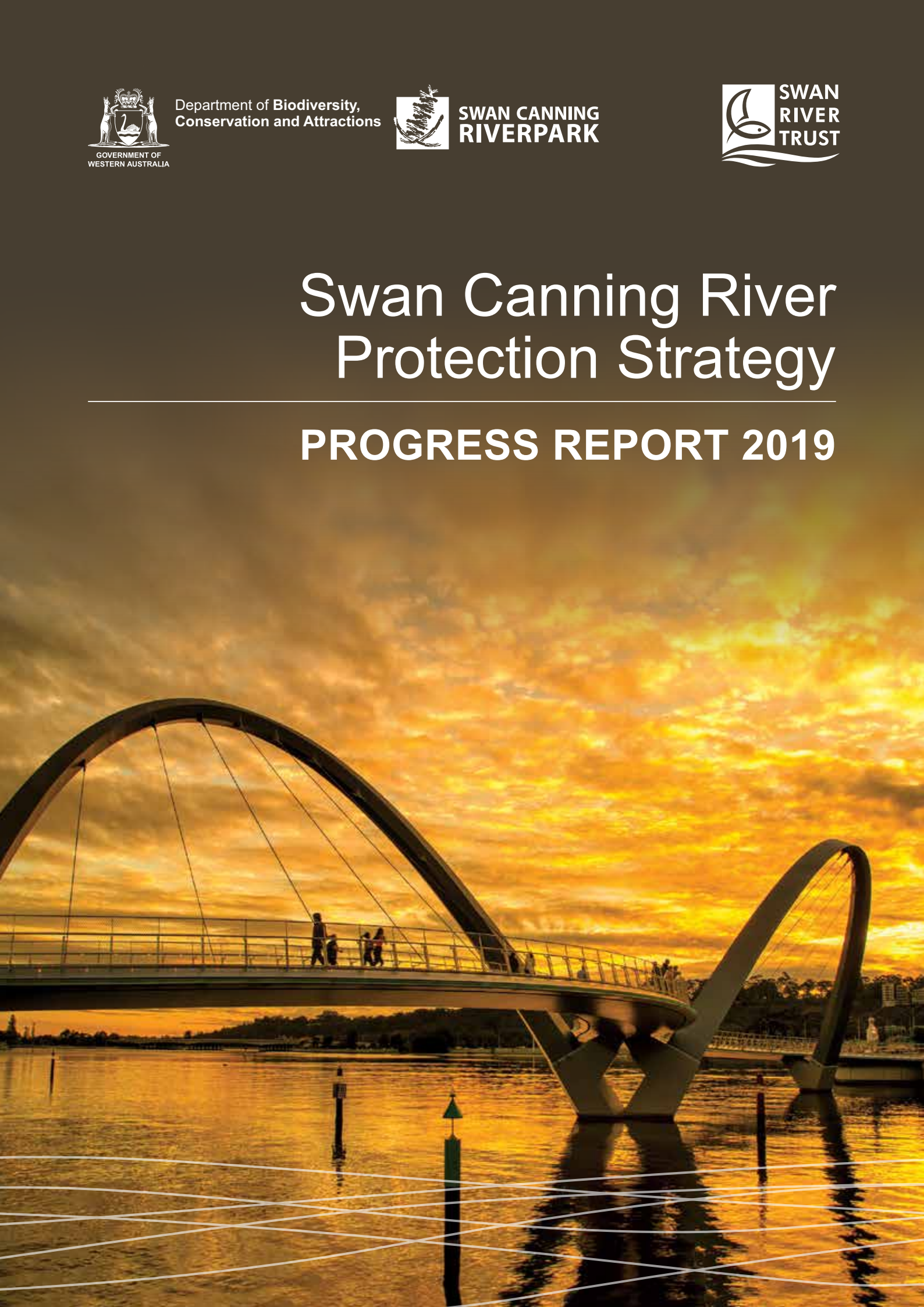

Photo: Jessica Wormuth

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Executive Summary

The *Swan Canning River Protection Strategy* (SCRPS) was released in November 2015 and heralded a new approach to bringing together a range of government organisations to clearly identify how agencies are working, both individually and collaboratively, to produce positive outcomes for the Swan and Canning rivers.

Under the *Swan and Canning Rivers Management Act 2006*, the Swan River Trust (the Trust) is required to produce progress reports, a biennial report and a five year report to help monitor the progress of the SCRPS. This is the second SCRPS progress report produced by the Trust based on the implementation of the SCRPS's Strategic Management Program. The development of this report has been supported by the Department of Biodiversity, Conservation and Attractions (DBCA).

This SCRPS Progress Report covers the period from July 2018 to December 2019. SCRPS partner agencies have provided short status reports on each project or task undertaken in support of SCRPS river management actions and have contributed to project case studies which highlight collaborations with other public-sector organisations, the community, industry or research organisations.

Notably, 89% of the SCRPS's 68 management actions have either been completed or are on track to address the relevant action. Just six of the actions have experienced any minor or significant delays.

Following the merger of many government departments in 2018, DBCA has worked with partner agencies to consolidate the operations of the SCRPS Advisory Group and has refined agreed reporting frameworks to ensure that each agency clearly understands their agreed responsibilities and proposed reporting timeframes.

During 2019 a SCRPS Advisory Group meeting was held to discuss machinery of government impacts on the core business of SCRPS partner agencies. A SCRPS Addendum was also produced in 2018 to update partner agency names and agreed river management actions for the SCRPS.

The actions within the SCRPS Strategic Management Program are structured around eight objectives. Based on the information provided by partner agencies, the status of these objectives within the reporting period is as follows:

Objective 1: Increase management coordination and collaboration between organisations with Riverpark responsibilities

Overall implementation is pleasing with the formal structures and agreements to support the implementation of the SCRPS now consolidated. Additional engagement and interaction between agencies to support activities beyond the actions listed in the SCRPS would be welcomed.

Objective 2: Improve water quality and manage environmental flow

This is a substantial objective, containing four separate strategies and 14 actions. Water quality improvement in rivers is only achieved through consistent and long-term activity in the catchment to reduce point and non-point source contributions of nutrients. Improving the condition of drains and tributaries via catchment restoration and constructed wetland projects has also been a priority to help 'strip' contaminants and nutrients out before they reach the rivers. DBCA, Department of Water and Environmental Regulation (DWER) and local governments are all working in diverse areas to achieve these outcomes.

Objective 3: Ensure management decisions are based on appropriate knowledge

Objective three has four actions, focusing on various monitoring programs across water quality and ecological health. These programs allow the tracking of progress against long term and short term sub catchment targets and help measure the effectiveness of management strategies for the river system.

Objective 4: Protect, manage and enhance biodiversity

This is the largest objective with five strategies and 14 actions. Implementation of the Riverbank program's foreshore restoration and stabilisation projects and the sub regional catchment restoration programs are progressing well. One collaboration of note is the Swan Alcoa Landcare Program (SALP) – a 21 year commitment to an important community partnership by DBCA, Alcoa and Perth NRM. This program provides funding for river restoration and conservation activities by local community groups. The State Government's Community Rivercare Grants program has also been welcomed by community groups seeking multi-year funding to deliver catchment restoration projects.

Objective 5: Maintain and improve sense of place with the Riverpark

This objective focuses on improving community understanding and engagement with the Riverpark and shows solid progress in providing opportunities for people to engage with information, interpretation and education opportunities focusing on culture and natural heritage. The River Journeys interpretation nodes have been a successful collaboration in supporting this objective with six interpretation nodes already developed, a seventh node being finalised at Kent St Weir and two other nodes in the planning phase.

Objective 6: Provide access and a safe environment for Riverpark users

This objective has four strategies and 13 actions that focus on safe access and use of facilities both on water and land, as well as continuing to improve the community's ability to access public lands adjoining the rivers. A project to conclude dinghy management around the foreshores is being finalised, with only two local governments remaining to complete the implementation of dinghy management systems.

A design to replace the jetty structure at Sandy Beach Reserve is underway, after its closure due to the jetty being found unsafe and unserviceable. Funding from the Recreational Boating Facilities Scheme is being used to plan and design a replacement jetty.

Ongoing foreshore stabilisation works continue with foreshore land managers and other agencies to protect infrastructure and recreational amenity. This includes the Department of Transport (DoT), Department of Local Government, Sport and Community (DLGSC) and Main Roads Western Australia (MRWA) as these agencies work to improve Riverpark facilities including public shared paths, cycle paths, marine facilities, toilets and lookouts.

Objective 7: Improve public knowledge and understanding of the Riverpark

There are five actions under this objective with good progress being made in all areas. DBCA's *River Guardians* program continued to provide *RiverWise* training, volunteering opportunities and presentations from scientific and behaviour change experts addressing key issues impacting our rivers. The *Dolphin Watch* citizen science research project continued to be delivered in Perth. The RiverWise Gardens behaviour change program also delivered education and home assessments to riverfront residents in priority nutrient suburbs. The RiverWise Gardening Workshops delivered by Josh Byrne also educated residents across the catchment.

Objective 8: Improve the way we do business

There are four strategies and 11 actions supporting this objective covering external investment, statutory approvals processes, legislation and support businesses. During the reporting period great progress was made on strategic land use planning initiatives, including development of the draft Perth Water Buneenboro Locality Plan, updating guidelines and providing advice into the review of State Planning Policy 2.10: Swan-Canning river system.

These initiatives support appropriate and responsible development in the Riverpark and will provide clearer guidance to proponents and commercial operators seeking licences and permits in the Riverpark.

DBCA's revised staffing structure in the Swan Region also achieved increased management efficiencies for the Swan Estuary Marine Park.

Introduction

The Swan Canning Riverpark is an iconic part of the Perth environmental, economic, and social landscape. The Trust is the community steward for this river system. The rivers provide a backdrop to the lives of the residents of Perth. Like any significant place, the Riverpark is subject to laws and requirements administered by various agencies and local governments. The only way to ensure the continuing health and amenity of the rivers is to have all elements of government working together in alignment.

The SCRPS was developed by the Trust, as required by the *Swan and Canning Rivers Management Act 2006*, to coordinate the efforts of individual agencies in order to achieve this goal. The SCRPS was released in November 2015. The SCRPS was developed in consultation with other government agencies, the community and various recreational, sporting, and community organisations with an interest in the future of the rivers. It includes a Strategic Management Program that lists those actions that the lead government agencies have identified as part of their core business. These river management actions contribute to the ecological health and community benefit of the Swan and Canning rivers.

The SCRPS Strategic Management Program contains 68 agreed river management actions (33 priority actions indicated with a "**P**"). These priority actions are required to be undertaken within five years and are a key performance indicator of the SCRPS. Achievement reporting agreements have been developed and refined with the lead government agencies to help define individual activities to implement actions.

This *Swan Canning River Protection Strategy Progress Report 2019* provides an update on the status of these agreed management actions and highlights the work of the SCRPS partner agencies in implementing this important cross government agency initiative. It covers the period from July 2018 to December 2019.

Riverfront living
Photo: Mark Thornley

Understanding this report

This report should be read in conjunction with the SCRPS. A traffic light approach has been developed to provide an easy visual reference to the status of each action listed in the SCRPS. The status of each action is displayed in a pie chart. Each pie chart is divided into segments depending on how many activities (projects or tasks) have been identified for each action. This provides a visual display of how the concurrent activities are tracking within the associated management action. Most actions only have one or two activities attached, whilst others may have up to ten. Some activities may be relatively minor. The classification is provided below:

1	**Green (on track):**	Activity is on track to address action.
2	**Amber (at risk):**	Activity undertaken is experiencing minor delays or is at risk of not addressing action. Attention required.
3	**Red (significant delay):**	Activity is experiencing significant delays and is unlikely to address action in the near future. Immediate review required.

Each lead agency has reviewed and reported on the status of the projects or tasks they are delivering in support of their SCRPS actions. As a result, each segment of the pie chart receives a colour depending upon the status of the relevant activity. For example, in the below action, DBCA has five identified activities that are delivering against the action. One activity is slightly delayed and therefore amber, while the other four are on track and are green.

Example only

11.1 Investigate threats to ecosystem integrity and processes	

Rufus Night Heron
Photo: Mark Thornley

Objective 1: Increase management coordination and collaboration between organisations with Riverpark responsibilities

1. Implement and review the strategy

Action		Status	DBCA	Swan River Trust
1.1	Establish a SCRPS Advisory Group **(P)**		●	
1.2	Establish collaborative agreements between management organisations **(P)**		●	●
1.3	SCRPS progress, biennial and five-yearly reports are to be delivered to the Minister for Environment, partners and the community **(P)**		●	

Implementation and review

The SCRPS Advisory Group was established in May 2016 with representatives from each lead organisation, as well as the Water Corporation and Tourism WA. DBCA co-ordinates the SCRPS Advisory Group to support SCRPS implementation and reporting on the Strategy's achievements to the Trust and Minister for Environment.

Collaborative agreements have been established between the Trust, DBCA and each of the key government agencies involved in the management of the Swan Canning river system. These agreements detail the activity undertaken by agencies in support of SCRPS actions. Machinery of Government changes influenced revisions to these agency agreements.

A monitoring, evaluation and reporting framework has been developed and refined for the SCRPS progress, biennial and five-yearly SCRPS reporting as required by the *Swan and Canning Rivers Management Act 2006*.

Perth Water mixed aquatic user groups
Photo: Matt Kleczkowski

Objective 2: Improve water quality and manage environmental flows

2. Reduce nutrients, organic material and sediment entering the Swan and Canning rivers

Action		Status	DBCA	DWER	Local Govt
2.1	Identify the levels and sources of nutrients, organic material and sediment entering the Swan and Canning rivers **(P)**		●	●	
2.2	Develop and implement Swan Canning and local Water Quality Improvement Plans to achieve nutrient load reduction targets **(P)**		●		
2.3	Prescribe and apply intervention techniques to either trap nutrients, organic material and sediments in drains and tributaries, or to achieve source control of these contaminants				●
2.4	Improve management of fertiliser use to reduce nutrient loss from urban and rural land in the Swan Canning catchment **(P)**		●		
2.5	Implement actions arising from the urban water drainage partnerships addressing strategic issues in the Swan Canning catchment		●	●	
2.6	Improve planning schemes and policies to achieve a net decrease in nutrient inputs from future land development				●

Water quality monitoring

DBCA undertook weekly water quality monitoring at 41 sites throughout the Swan Canning Estuary, with nutrients being monitored fortnightly at 20 of those sites. Water quality and nutrients are also monitored fortnightly at 33 sites within the Swan Canning catchment.

This monitoring provides information on physical water quality parameters, levels and sources of nutrients, organic material and sediments within the Swan Canning river system and is used to identify priorities for river management and important initiatives, such as Water Quality Improvement Plans (WQIPs), development of the Swan Canning Estuarine Response Model (SCERM) and the revision of the Swan Canning Water Quality Improvement Plan.

A monitoring program methodology is being developed to sample the waters around riverbed leases to test for pollutants or contaminants being discharged from or into leased riverbed premises. This project is being undertaken in collaboration with DoT.

Water Quality Improvement Plans

Local WQIPs have been developed for catchments contributing the greatest amount of nutrients and contaminants. These WQIPs were developed by DBCA in consultation with regional and sub regional Natural Resource Management groups, community groups, industry organisations, local government, State Government agencies and the Water Corporation. Sub-catchments with local WQIPs include Bennett Brook, Bayswater Brook, Ellen Brook, Southern River, Mounts Bay, Bickley Brook, Canning Plain, Bannister Creek, Saint Leonards and Bull Creek. DBCA is currently reviewing the local WQIPs to assess progress against their prescribed actions. These reviews will also determine which WQIPs will be updated, based on the level of support from key stakeholders and the ongoing requirement for water quality improvement.

Water quality monitoring at Ellen Brook wetland
Photo: DBCA

Intervention techniques

DBCA is working closely with local governments to improve water quality and manage environmental flows throughout the Swan Canning river system.

Monitoring of the Eric Singleton Bird Sanctuary wetland continued through a partnership with the Cooperative Research Centre for Water Sensitive Cities (CRCWSC), the University of Western Australia (UWA) and the City of Bayswater. An assessment of wetland performance in improving water quality was due to be completed in early 2020.

The Ellen Brook constructed wetland treated over 170 megalitres of water from Ellen Brook, which flows into the Swan River. The wetland uses Iron Man Gypsum, a by-product of Iluka Resources mineral sands mining, to strip nutrients from the water.

Site selection and prioritisation for new drainage intervention works continued. This decision support tool is assisting public land managers by providing strategic advice and guiding DBCA's future investment in drainage improvement works in the Swan Canning catchment.

Ashfield Flats Reserve is a high conservation value asset representing the largest remaining river flat in the Perth metropolitan area. Understanding the site's hydrology is crucial for determining the best management for the reserve and informing the design of any future interventions aimed at improving water quality. A hydrological study of the reserve, funded by the Department of Planning, Lands and Heritage (DPLH), captured seasonal and event data throughout 2019 with the aim of producing a final report and recommendations by mid-2020.

Hydrological and nutrient modelling of the Swan Canning catchment-estuary system commenced in late 2018. This five year, multi staged project is being undertaken by UWA through the CRCWSC and will update and expand on modelling originally conducted in 2008. DBCA continued to partner with UWA to address key data requirements of the SCERM and to develop a virtual observatory for the Swan Canning estuary. This updated modelling will support the revision of key river management strategies and actions.

Fertiliser use

DBCA funds the Phosphorus Awareness Project (PAP), delivered by the South East Regional Centre for Urban Landcare (SERCUL). The program targets fertiliser use and nutrient loss from urban and rural land within the Swan Canning catchment. It provides educational resources, presentations, and opportunities for getting involved in landcare for schools and at community events. PAP increases awareness of catchment issues in the community, local governments, and industry, particularly in reducing nutrient inputs such as phosphorus from fertilisers.

Urban Water Drainage Partnerships

DWER and Water Corporation have created a new cooperative urban drainage partnership – Drainage for Liveability. DBCA supports this partnership and is continuing its long-standing activities of identifying and delivering on urban drainage projects in conjunction with local governments. DBCA manages and contributes funding and in kind services to the following Drainage for Liveability projects:

Wharf St Smart Park – Cannington, Mundaring Weir ecological linkage project – Mundaring, Russell St living stream – Bayswater, Bennett Brook catchment revegetation project, and the Lockridge and Jacobsen Way living stream revegetation project – Bayswater. These projects are designed to improve community benefit, amenity, ecological health and water quality around metropolitan drains and wetlands.

Planning schemes and policies

Twenty local government authorities manage lands within the Swan Canning Riverpark (Riverpark). These agencies continue to work with DBCA to improve planning schemes and policies that lead to a net decrease in nutrient and other contaminant inputs. This is achieved by ensuring that local government schemes and policies are consistent with *Better Urban Water Management*, the *Stormwater Management Manual for Western Australia, Decision Process for Stormwater Management in WA* and DBCA's Parks and Wildlife Service *Policy 49 - Planning for Stormwater Management affecting the Swan Canning Development Control Area*. DBCA provides advice to local government authorities to support consistent approaches in line with the WA Planning Commission (WAPC) and DBCA policies.

3. Reduce non-nutrient contaminants entering the Swan and Canning rivers

Action		Status	DWER	DBCA
3.1	Regulate and manage pollution from contaminated sites, prescribed premises and other commercial activities with the potential to cause pollution **(P)**		●	
3.2	Maintain inventory database of confirmed contaminated sites in the catchment, monitor appropriate remediation for sites and use the clean-up notice provisions of the Contaminated Sites Act as required		●	
3.3	Maintain an inventory of sources of pollution incidents		●	
3.4	Undertake action to address identified sources of pollution			●

Pollution regulation and management

DWER works with local government and other State government agencies in responding to serious pollution incidents and hazardous materials emergencies state-wide, with a 24/7 availability. DWER has the capacity to respond to incidents such as fuel tanker roll overs, chemical spills, chemical fires, illegal chemical dumping and hazardous materials truck crashes.

Contaminated sites

DWER continues to regulate new and existing sites along the Swan and Canning rivers that may represent a potential risk to human health or the environment. This is done in accordance with the requirements of the *Contaminated Sites Act 2003*. DWER also maintains the Contaminated Sites Database for Western Australia.

Light industry audits

The Light Industry Program is a DWER program in partnership with six local governments. This program aims to reduce light industry's contaminant input to the rivers in priority catchments. Audits are conducted on light industrial and commercial premises to ensure compliance with environmental obligations.

The majority of business owners and operators were proactive in resolving issues identified at their premises once made aware of the risks to waterways. The Light Industry Program has improved the rate of compliance of businesses audited through inspections and re-inspections. The remaining non-compliant businesses will be subject to follow up inspections.

Light Industry Audit program officers
Photo: Courtesy of DWER

Case Study: Sediment Taskforce

The Sediment Task Force (STF) represents a collaborative approach to the development of solutions to prevent sediment run-off particularly, but not exclusively, from building sites. The Sediment Task Force co-ordinator is funded by DBCA and supported by Perth NRM.

STF is a multi-partisan group with representatives from leading housing industry groups including the Housing Industry Association (WA), Master Builders Association (WA) and Urban Development Institute of Australia (WA).

Government environment managers and enforcement agencies including DBCA, Department of Health (DoH), Main Roads WA, Water Corporation, West Australian Local Government Association (WALGA) and the Cities of Cockburn, Kwinana and Subiaco are also working with community environmental groups like SERCUL and Perth NRM to help reduce sediment impacts on the Swan and Canning rivers.

The City of Bayswater has facilitated cooperation from builders and developers while the Town of Cambridge is addressing sediment loss at its source. The City of Cockburn has adopted a multi faceted approach for sand drift and dust management while the City of Kalamunda has developed a comprehensive regulatory framework to decrease sedimentation. The City of Subiaco is remediating environmental degradation caused by sedimentation and the City of Swan has introduced development design specifications work for subdivisions.

The STF discovered a lack of research on the issue of sediment control and funded a study to evaluate and quantify sediment arising from urban development. It will provide insights into the discharge of sediment as water-borne particulates.

The study is being undertaken in conjunction with the UWA as part of the Australian Governments' Cooperative Research Centre for Water Sensitive Cities (Perth). The findings will inform decision making to manage sediment loss from urban development to reduce the impact on water quality and drainage infrastructure and help meet environmental standards on construction sites.

The Cities of Armadale, Gosnells and Kwinana, DBCA, Main Roads Western Australia, SERCUL, the Water Corporation and the WALGA have contributed financial and in-kind support towards this two-year research project. A report detailing the results is expected to be completed by June 2020. Perth NRM have also provided in-kind support to help ensure the success of this study.

Work has also commenced on developing erosion and sediment control guidelines for builders, developers and local government.

A silt curtain holding back sediment from the river system

4. Undertake intervention works and/or programs to improve or maintain water quality

Action		Status	DBCA	DWER
4.1	Increase dissolved oxygen levels in the Swan and Canning rivers where required **(P)**		●	●
4.2	Investigate approaches to moderate and reduce the prevalence of algal blooms **(P)**		●	●
4.3	Adapt the use of oxygenation and other innovative technologies to manage future water quality issues as climate change science is updated		●	●

Oxygenation and innovation

DBCA works with DWER to operate four oxygenation plants. Two plants on the upper Swan River (Caversham and Guildford) supplement oxygen over a 10km section of tidal estuary and the two on the Canning River (Nicholson Road, Ferndale and Bacon Street, Wilson) maintain oxygen levels over 4.6km of the Kent Street Weir-pool.

The daily operation of the oxygenation plants is undertaken by DWER under a service agreement. Their primary aim was to maintain oxygen levels above critical ecological thresholds (4mg/L dissolved oxygen). Key performance indicators were measured weekly to monitor the effectiveness of the plants to maintain dissolved oxygen over the target areas. Seasonal KPIs were consistently within the 'Good' category (i.e. over 80% of measurements above 4mg/L).

Several interruptions to operations occurred, including: blocked suction lines at Guildford and Nicholson Road; a bushfire adjacent to the Nicholson Road oxygenation plant in March 2019 (no major damage occurred to oxygenation plant infrastructure); and upgrades to Water Corporation's sewerage pump-station requiring Guildford to operate on diesel generator for two weeks. These issues were rectified quickly, with only short term impact to river oxygen conditions observed.

Algal bloom controls

From late summer through to late autumn 2019 the Riverpark was impacted by an extensive bloom of dinoflagellate algae, known as *Alexandrium* spp. This alga produces Paralytic Shellfish Toxin (PST) which can accumulate in shellfish, crabs and other biota and may cause paralytic shellfish poisoning in people who eat contaminated seafood. This event was a new phenomenon; the most intense of its kind recorded in natural waters in Western Australia, and DBCA undertook a preliminary investigation of a potential clay-based solution to control the bloom.

Slurries of a locally sourced bentonite clay was applied at a range of application rates to *Alexandrium* suspension in a controlled laboratory trial. Results (Figure 1) indicated that while clays are a potential viable control option, significant further effort needs to be undertaken to design a clay-additive matrix that is effective at significantly lower application rates (~0.2 mg/L) if costs and environmental impacts are to be kept to acceptable levels.

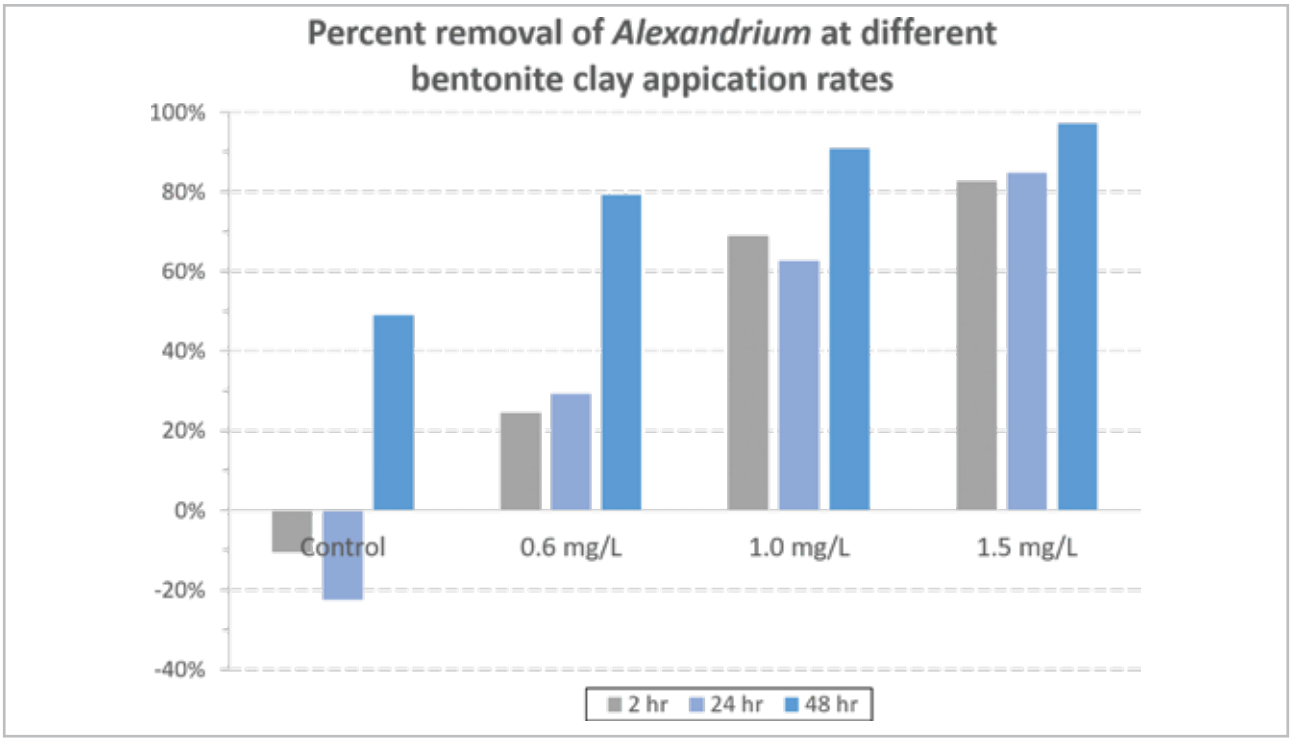

Figure 1: Results of laboratory-based trial clay application for Alexandrium bloom control.

In 2019, DBCA also undertook trials of other potential algal control agents and continues to work with local, national and international experts towards algal bloom control solutions appropriate for the Riverpark.

5. Maintain or improve environmental flows to rivers

Action		Status	DBCA	DWER
5.1	Investigate, plan and manage environmental flows to the Swan and Canning rivers		●	●

Supporting environmental flows

DBCA and DWER work together to investigate and prescribe environmental water provisions for major tributaries of the river system, particularly the Helena and Canning rivers. River levels are monitored with the assistance of Water Corporation to determine the rates of water releases for optimal ecological benefit.

Investigations into the flow response of fish communities in the Lower Helena river were conducted. The results will inform ecological water requirements to improve the timing and rates of water releases from the Lower Helena Reservoir, with a focus on improving connectivity between river pools and high quality habitat.

Following a survey in the upper Canning River of an invasive fish (the pearl cichlid), an existing weir in Kelmscott was modified to prevent pearl cichlids from moving further upstream.

Kent Street Weir Upgrade

The upgraded Kent Street Weir has been operating since late 2018 and now permits safer and more effective control of water levels in the Canning River and flows to the Canning Estuary and prevents saltwater intrusion upstream of the weir. The fishway incorporated into the weir also permits effective passage of native fish through the weir.

Objective 3: Ensure management decisions are based on appropriate knowledge

6. Coordinate a water quality and ecological health monitoring and evaluation program

Action		Status	DBCA	DWER
6.1	Undertake river and catchment-based water quality monitoring program to measure compliance against management targets **(P)**		●	●
6.2	Establish a program to monitor non-nutrient contaminants entering, and in, the river system **(P)**		●	
6.3	Monitor and report on the extent and severity of algal blooms and other events affecting water quality		●	●
6.4	Develop a suite of ecological health indicators to support reporting		●	●

Water quality monitoring

DBCA undertakes weekly water quality monitoring at 41 sites throughout the Swan Canning estuary, with nutrients being monitored fortnightly at 20 of those sites. Water quality and nutrients are also monitored fortnightly at 33 sites within the Swan Canning catchment. Information on water quality is provided to the public through weekly updates and detailed annual reports. Both are available on the DBCA website.

Results from the monitoring program were also evaluated against key performance indicators in SCRPS Biennial Report 2018.

Monitoring at Weld Square Living Stream project
Photo: Jennifer Eliot

A major review of environmental monitoring was finalised and, together with Machinery of Government changes, triggered significant shifts in operational delivery of water quality monitoring. The review also triggered a number of projects exploring new technologies for monitoring. DBCA has been working with CSIRO and Murdoch University to evaluate the potential of FlowCAM and multiwavelength fluorometer technology for plankton monitoring in the Swan Canning. FlowCAM technology was found to be unsuitable for local application in the desired manner. Multiwavelength fluorometers are promising new tools for water quality monitoring and management and further assessment is in progress. The review will continue to provide a basis for further refinements of the monitoring program and a trigger for new initiatives over time.

Non-nutrient contaminants

Investigations into non-nutrient contaminants in the Swan Canning estuary and its catchment continued, with a focus on Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) in surface waters and key recreational fishing species. Reports are being finalised.

Algal blooms and other events affecting water quality

Phytoplankton is monitored routinely on a weekly basis at 20 sites in the Swan Canning. Both chlorophyll levels (as an indicator of phytoplankton activity) and phytoplankton composition is assessed. Information on phytoplankton activity within the estuary is also provided weekly in the West Australian newspaper.

DBCA evaluates weekly monitoring results against guidelines in its Algal Bloom Response Protocol. Where algal blooms reach pre-defined trigger levels in the rivers, a set of actions are put in place and, where appropriate, notifications are issued to community stakeholders and the public. These notifications include warnings on potential public health, amenity or environmental impacts arising from different types of algal blooms. The Protocol is reviewed annually by a multi-agency panel (including representatives from DBCA, DWER and DoH) and updated based on new knowledge derived locally and elsewhere with respect to the impact of harmful blooms.

In 2019, DBCA, Department of Primary Industries and Regional Development (DPIRD) and DoH collaborated as part of an incident response team to respond to a toxic *Alexandrium* algal bloom that affected the river between February and May (see case study – Alexandrium). Learning associated with that bloom was considered as part of the Response Protocol review in September 2019 and has been applied since *Alexandrium* returned into the rivers in December 2019.

DBCA also provides advice and response to other types of river incidents and river management issues including dolphin deaths, fish kills, contaminants, pathogens, pollution and flood effects.

Resident Riverpark dolphins playing in the shallows
Photo: Mark Thornley

Case Study: Alexandrium

A bloom of the harmful alga, *Alexandrium minutum* occurred between February and May 2019 and affected an area between Dalkeith and Middle Swan. This alga produces toxins that can be accumulated in shellfish and other biota and may cause paralytic shellfish poisoning in people who eat contaminated seafood.

Additional water quality and biotic sampling (mussels and crabs) was conducted in response to this toxic algal bloom in the Swan estuary. The severity of the bloom led to DoH issuing a health warning to advise the public to not consume fish, crabs or shellfish from the affected areas of the estuary.

DBCA, DPIRD and DoH shared financial and officer resources to lead a collaborative incident response to the *Alexandrium* algal bloom. Final sampling conducted in May 2019 confirmed the bloom had subsided and toxins were no longer present at levels of concern in biota, allowing the public health warning to be lifted.

An *Alexandrium* bloom was again detected above notification levels in December 2019 and a multi-agency incident response was again initiated. Additional sampling including biota testing for toxins has been undertaken and DoH has issued alerts for affected areas. Further monitoring initiatives such as genetic testing and rapid toxin screening tests are being investigated.

Alexandrium algal bloom, Matilda Bay
Photo: Greg Schneider

Ecological health indicators

Measures of ecological health complement water quality monitoring and reporting and provide more information about the overall health of the Swan and Canning rivers. DBCA has been working with project partners to progress the development, validation and implementation of environmental health indicators.

Seagrass sampling was undertaken by DWER to develop and validate measures of seagrass performance within the estuary. The 2018-19 season seagrass sampling was conducted between December 2018 and March 2019 and included a broad-scale survey of seagrass distribution in the Riverpark. Seagrass meadows were found further upstream in the Canning estuary compared to observations in 2011.

An assessment of fish communities is undertaken annually. Field work was completed in late summer and autumn of 2018 and 2019 with a report occurring later in the year. The 2018 condition assessment of the Swan Canning estuary based on the Fish Community Index (FCI) identified an improvement in ecological condition compared with 2017, when the estuary was impacted by atypical summer river flows. Results of the 2019 report are shown in the following case study.

Case Study: Fish Community Index

Photo: Jennifer Eliott

Fish communities exhibit predictable responses to ecosystem degradation/stress and can be used as sensitive indicators of the ecological condition of these systems. Biotic indices, based on fish and other biological communities, are now used worldwide to quantify the ecological health of rivers, lakes, estuaries and many other environments.

The FCI for the Swan Canning estuary was developed by Murdoch University over five years (2007-2012) in collaboration with the Trust, the Department of Water and the Department of Fisheries.

The index, which was developed from a 30 year dataset, is the first of its kind for assessing estuarine health in Australia and has been subjected to extensive testing, validation and review to provide a robust and sensitive tool for monitoring and reporting.

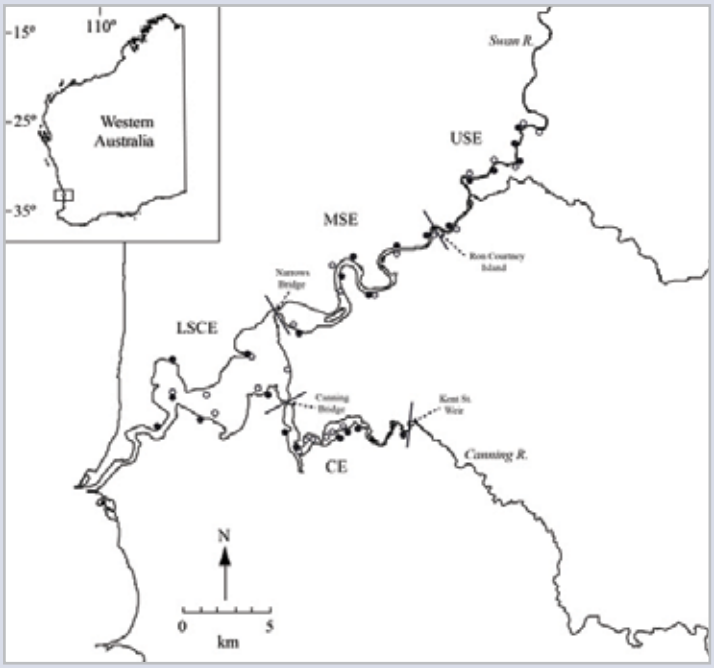

Figure 1: *Locations of nearshore (black circles) and offshore (open circles) sampling sites. LSCE, Lower Swan Canning estuary; CE, Canning estuary; MSE, Middle Swan estuary; USE, Upper Swan estuary.*

The FCI complements traditional water quality testing as a measure of the condition of the system and since 2012 has been part of regular monitoring and reporting on the waterway. A report on fish communities in the Riverpark is released to the public annually.

The FCI combines signals from numerous characteristics of the fish community (e.g. the numbers, diversity and identities of different species, and the relative proportions of species with different feeding and habitat requirements). The resulting index score (0-100) quantifies the ecological health of the Swan Canning estuary and results are reported as **A**, very good – **E**, very poor.

Fish communities were sampled over the summer and autumn of 2019. Six nearshore and six offshore sites in each of four management zones of the Swan Canning estuary were sampled using a seine net and multi-mesh gill net (Figure 1). Collected fish were identified, counted and returned to the water alive. Species abundances in each sample were then used to calculate values for the core metrics that together make up the nearshore and offshore fish community index. In turn these are used to calculate an overall index score for each zone.

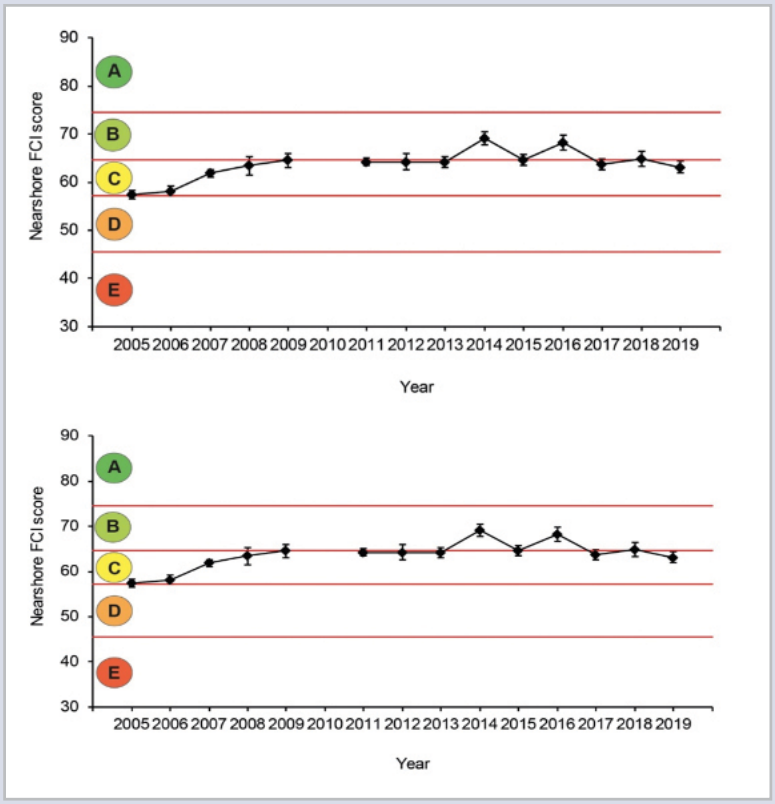

Figure 2: *Trend plot over recent years of the average (± standard error) Fish Community Index (FCI) scores for nearshore and offshore waters across the whole Swan Canning estuary.*

Condition grades are **A***, very good;* **B***, good;* **C***, fair;* **D***, poor;* **E***, very poor*

Red lines denote boundaries between condition grades.

Across the estuary as a whole, the ecological condition of both nearshore and offshore waters in 2019 was assessed as fair (C), based on their fish communities (Figure 2) These results are consistent with the relatively stable trends in condition that have been observed since 2011.

Overall, the offshore waters of the Canning estuary exhibited the lowest scores of any zone in 2019. Since the start of regular fish community monitoring in 2012, the offshore waters of this zone have consistently scored poorly relative to other zones across both seasons (receiving a **D** grade in 50% of monitored seasons), and some additional monitoring may be necessary in future to better understand the factors underlying this trend.

Monitoring and reporting will occur again in 2020.

Objective 4: Protect, manage and enhance biodiversity

7. Manage fish communities to maintain diversity and abundance

Action		Status	DPIRD/ Fisheries
7.1	Manage aquatic resources in the Swan Canning river system using a risk based management framework **(P)**		●
7.2	Protect and monitor the stock status of priority species in the Swan Canning river system according to risk **(P)**		●
7.3	Investigate fish re-stocking where appropriate		●
7.4	Involve recreational fishers and commercial tour operators with monitoring fish stocks		●
7.5	Promote responsible fishing behaviour (e.g. abiding by catch limits, protecting shoreline vegetation, using fishing platforms provided and using fishing line bins for unwanted tackle, bait packaging and other refuse)		●

Managing fish stocks

DPIRD uses a risk and evidence based approach to managing and monitoring aquatic resources. The risk imposed by fishing is currently considered by Fisheries research division to be low to the fish stocks. Crabs are monitored via statutory catch and effort returns by the commercial fishers and reported annually in the *Status Reports of the Fisheries and Aquatic Resources* (SRFAR). Within the Riverpark there is currently one commercial operator targeting blue swimmer crabs. Recreational fishers also target this species throughout the year.

The status of fish stocks in the Swan and Canning rivers are also reported annually as part of the West Coast bioregion within the SRFAR. Results for species including cobbler, crabs and herring are aggregated within data collected across the entire West Coast Bioregion and statuses for the specific populations within the rivers are not available.

The Swan Canning population of black bream is reported individually and is currently assessed as “adequate”. The SRFAR is available here: http://www.fish.wa.gov.au/About-Us/Publications/Pages/State-of-the-Fisheries-report.aspx

The *Resource Assessment Framework* (RAF) (2011) describes how DPIRD/Fisheries has selected indicators and what indicators are used in which location. Cobbler, black bream and herring are all identified for the Swan and Canning rivers as part of the West Coast estuarine suite. The RAF is currently being updated and refined. Fishing restrictions can be implemented if protection of fish stocks is required.

The overall sustainability of black bream, cobbler and Perth herring are all listed as being at moderate risk across the West Coast bioregion within the estuarine zones. Cobbler are restricted and may not be taken by fishers at all in the Swan Canning river system. Bag limits are also in place to restrict the number of black bream and crabs that can be taken within the Swan Canning river system.

The RAF is available here: http://www.fish.wa.gov.au/Documents/occasional_publications/fop085.pdf

Fish restocking

DPIRD has a policy on Restocking and Stock Enhancement in Western Australia (http://www.fish.wa.gov.au/Documents/management_papers/fmp261.pdf) that it currently uses to assess all proposals.

Community Involvement

DPIRD/Fisheries manages and promotes the Research Angler Program (RAP). Data from this program is reported as part of the SRFAR. Typically, more than 800 logbooks at any one time are being reported by RAP participants. Data from catch cards at recreational fishing events such as *Swanfish* is also collected and can aid with monitoring fish stocks.

DPIRD/Fisheries has community education officers who promote responsible fishing practices at events, schools and through communication material such as brochures, posters, websites and social media. In addition, Fisheries officers with powers under the *Fish Resource Management Act 1994* undertake education and compliance with priorities established through a risk based process.

8. Protect and rehabilitate foreshore

Action		Status	DBCA
8.1	Provide protection for riparian and/or aquatic vegetation **(P)**		●
8.2	Provide guidance on best management practices for shore stabilisation **(P)**		●

Protecting foreshores

DBCA provides funding towards riverbank rehabilitation and protection in conjunction with foreshore land managers through two schemes – the Riverbank Grants program and the Proactive Funding Scheme. In 2018-19, $1 million was provided under these programs to fund 12 priority riverbank projects across 10 foreshore land managers to help protect, improve and manage Riverbank areas of the Swan and Canning rivers.

These Riverbank programs assist with the development, coordination and management of foreshore projects as well as the provision of advice and support to facilitate best management practices among foreshore land managers. There are currently 46 active riverbank projects that have received advice on best management techniques for shoreline stabilisation.

These projects include erosion control, revegetation, weed control, river wall construction, enhancing river access, widening vegetation corridors, creating native animal habitat and preparation of foreshore management plans. Further, through the Riverbank Extension Plan, Riverbank has assessed foreshore land manager knowledge of restoration techniques, particularly bioengineering with encouraging results.

This same exercise bore out the *Best Management Practices for Stabilisation on the Swan and Canning Rivers* as a popular, understood and utilised resource. A Swan estuary-based tour for foreshore land manager officers, focusing on innovative applications of stabilisation techniques, proved popular with very positive participant feedback.

Case Study: John Tonkin Reserve Headlands

Riverbank are currently undertaking a multi year foreshore stabilisation project at John Tonkin Reserve in collaboration with the Town of East Fremantle. The project aims to stabilise the historically reclaimed foreshore and improve the ecological and amenity value of the reserve. This project area extends from Leeuwin Boat ramp upstream to Swan Yacht Club rock groyne and is a prime foreshore amenity site in the lower estuary.

The project is the result of a 2015 East Fremantle Foreshore Management Plan, also co-funded by Riverbank, with John Tonkin Reserve Foreshore Plans subsequently developed to protect the area from active erosive pressures, assist with establishment of riparian vegetation and increase public amenity space on the foreshore. A key benefit of the offshore headland design is that no protection infrastructure is situated on the beach area protecting its shallow profile popular with families and paddle craft users (kayakers and stand up paddle boarders). The offshore headland design had not been used previously in the Riverpark and has proved popular with the local community.

The foreshore and landscape design supported the relocation and consolidation of carparking to facilitate greater space for public amenity. This allowed for the construction of an interpretation node showcasing the historical value of the site. This node replicates existing DBCA funded interpretation infrastructure located nearby at Bicton Baths and Point Walter.

The final and key component of the project was the establishment of riparian vegetation across the project area which encompassed weed management targeting exotic *Casuarina glauca,* temporary fencing to manage access, sedge planting to assist with further foreshore stabilisation and revegetation with a range of native estuarine species.

The project is due to be completed in 2020 and will conclude many years of active engagement with the community and the Town of East Fremantle.

Constructed offshore headlands and revegation along the John Tonkin Reserve foreshore

9. Reduce the adverse impacts of introduced plants and animals in the Riverpark

Action		Status	FLM	DPIRD	DPIRD/ Fisheries
9.1	Manage riparian and/or aquatic weeds		●		
9.2	Coordinate the management of declared plant species			●	
9.3	Where resources allow, investigate and map the extent of occurrence of feral fish and invasive species, and mitigate impacts by directing efforts into the early control of invasive species				●

Weed Management

Foreshore land managers are responsible for the onsite management of land adjoining the rivers, including weed control. They include the 20 local governments and various State agencies including DPLH, WAPC and DBCA. DPLH, on behalf of WAPC, continues to implement weed removal programs either on its own or in partnership with local government. The department also has a program to remove exotic trees and revegetate the foreshores owned by WAPC with native species endemic to the area.

DBCA, SERCUL and a number of local governments have conducted aquatic weed control of Amazon frogbit. Hydrocotyle control is continuing with a project coordinated by SERCUL supported by Federal Government Swan Canning River Recovery Program funding and Perth NRM. Weed control and rehabilitation projects are also in progress at Whiteman Park, Guildford and at Lot 216, Caversham, adjacent to Mandoon Estate. A weed management strategy was also successfully implemented for DBCA managed lands within the Riverpark.

Declared plant species

DPIRD supports the coordinated community control of widespread and established plant and animal species declared under the (BAM Act). DPIRD maintains and, where appropriate, replies to reports of declared plant and animal species. The community is now able to provide these reports through the *MyPestGuideReporter* app.

Invasive fish species

DPIRD manages a publicly available freshwater fish database which records all research reports and pest fish reports for freshwater systems. DPIRD prioritises prevention activities in biosecurity management. This includes promotion of the *don't dump that fish* message and early detection methods such as Fisheries *Pestwatch* app. DPIRD also provides technical advice and best practice advice to local government authorities and community groups on pest fish management in wetlands and lakes throughout the metro area.

Chittering Landcare Centre officers and property owner inspect successful weed control and plantings
Photo: Mark Thornley

Case Study: Amazon frogbit

Amazon frogbit prior to removal in Riverpark waterway

Amazon frogbit, is a highly invasive floating aquatic weed from South America that is often sold as an aquarium and pond species. It was first discovered in Liege St Wetland in 2013 and since then a further 10 outbreaks have been recorded, eight in the Swan Canning sub catchments and most recently at South Belmont.

SERCUL has coordinated education and on-ground response efforts and frogbit has been eradicated at problem sites or is currently being treated through Federal Government Swan Canning River Recovery Program funding through Perth NRM, Water Corporation, DBCA and local governments who contribute to identification and eradication of infestations.

SERCUL also organised a stakeholder forum to help gain stakeholder agreement for declaration of the species. An outcome of the forum was the listing of Amazon frogbit under section 22 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act). The species was designated with a No Control Category and Exempt Keeping Category species which allowed listing on the Western Australian Organism List, but not for regulation to stop supply and sale of Amazon frogbit or compliance activities to be undertaken.

10. Maintain environmental values of the Riverpark with the community

Action	Status	DBCA
10.1 Administer legislation to manage the Riverpark including the use of vessels and facilitate safe community use **(P)**		●
10.2 Maintain an incident response capability to ensure public safety and environment protection		●

Facilitating safe community use of the Riverpark

DoT is responsible for marine safety through legislation that controls licensing of boat skippers as well as provision of navigation aids throughout the river and regulating aquatic use and activities on the river. DoT is responsible for establishing speed limits and gazetted specific areas for higher risk aquatic activities such as jet skiing within the rivers. DBCA staff meet with DoT on a quarterly basis to coordinate joint agency patrols and undertake compliance, particularly during peak periods. DBCA has several boats operating on the river to promote the safe and responsible use of the river for the community.

DBCA continued to deliver the *Swan Canning Riverpark Boating Management Strategy* and Aquatic Use Management Framework with DoT. The departments work together on marine safety issues to ensure that different user groups and activities can equitably access the river in a safe and appropriate manner and to minimise conflicts between incompatible activities.

Incident response capabilities

DBCA has incident response protocols established with various organisations to respond to critical events as they arise within the Riverpark. These are reviewed on a regular basis. Response plans have been developed for dolphin deaths or injuries, oil spills, algal blooms, wastewater spills and oiled wildlife.

DBCA responded to 241 complaints in and around the Riverpark during 2019. Zero foreshore vegetation protection signs were installed in the Riverpark, however six signs were removed, after the two year installation period expired, with no further incidents of damage in these areas. These signs are a successful tool to reduce vegetation damage and help educate the public about the value of shoreline vegetation. 11 incidents were reported of vegetation damage in 2019.

11. Improve understanding of Riverpark ecosystem through research

Action	Status	DBCA
11.1 Investigate threats to ecosystem integrity and processes		●
11.2 Improve understanding of the biophysical environment of the Riverpark		●

Investigating threats to ecosystem integrity

Cetacean Morbillivirus (CeMV) is believed to be responsible for the deaths of five Riverpark dolphins in 2019. DBCA has been working closely with Murdoch University to understand dolphin deaths and track incidents of this disease that has affected more than one species of cetacean along the coast.

DBCA has been working with UWA to understand the causes of poor condition of seagrass in the Alfred Cove Marine Park, reported by DWER following a five-year investigation of seagrasses in the estuary. Key drivers of poor seagrass health along parts of the Attadale foreshore have been identified including high nutrient in-flows, heavy metals and low water movement. Importantly, it has been recognised that there is danger in assuming consistency at the local scale as parts of Attadale foreshore also had some of the healthiest seagrass recorded. The outcomes of this project will influence management strategies for the Alfred Cove marine park and how seagrass communities are monitored in the wider Riverpark.

DBCA has been working with Murdoch and UWA to understand the cause and mitigation approaches for decline of the flooded gum (*Eucalyptus rudis*) at Guildford. Remote sensing has been used to identify and map historic vegetation condition changes. Field survey and model development are being applied to determine the extent to which hydrodynamic change may have contributed to vegetation decline. Tree surveys and evaluation for Phytophthora have been conducted and with the assistance of community trials of the effectiveness of phosphite and nutrient injections have been undertaken in an attempt to reduce dieback. Although initial treatment was not effective in improving tree health, follow-up injections and assessment are planned.

Understanding the biophysical environment

DBCA collaborates with various research groups and agencies to investigate the biological and physical environment of the Swan and Canning rivers. Some key projects that have been delivered under the SCRPS include:

a) investigating habitat value of seagrass and macroalgae;

b) addressing the decline of the western school prawn;

c) estuarine response model and frameworks for reporting; and

d) tracking of priority estuarine fish species, with a particular focus on the oxygenation zone in the upper Swan River.

Seagrass is recognised as an asset in the Riverpark playing an important role in stabilising sediment and maintaining oxygen levels at the sediment / water interface. It is also an important food source for the black swan and is thought to support diverse and productive faunal assemblages. Macroalgae are commonly found in the lower reaches of the Riverpark in late spring and summer, and in recent years, large amounts of macroalgae have accumulated in response to favourable growth conditions. The macroalgae is fast-growing and is often considered a nuisance because it reduces light conditions to seagrass beds and can affect reproduction.

DBCA supported a project at Edith Cowan University to investigate the biodiversity and ecological values of seagrass meadows and macroalgae accumulations in-water and as accumulated wrack. This work was important given regular complaints of community to remove accumulated wrack from foreshores. Seagrass and algal wrack did not appear to be beneficial to invertebrate or fish assemblages. However, the decomposition pathway of this material and its contribution to the detrital food web is not known at this time.

Between 2013 and 2016, 4.5 million prawns were grown in aquaculture and released into the Swan Canning Estuary. Research and restocking was undertaken collaboratively with Murdoch University and the Australian Centre for Applied Aquaculture Research and accompanied by a community education and engagement project, known as *Prawn Watch*, run through the DBCA *River Guardians* Program.

The abundance of the western school prawn increased over the first three years of the study, driven by the hatchery releases of prawns, the persistence of marine-like salinities and favourable oxygen conditions in the estuary. A late autumn / winter season in 2016, a series of low oxygen events and a very cool wintering / spring period had negative influences on the population. In addition, a flood event (February 2017) caused widespread hypoxia during the breeding season of 2016-17. The spatial extent of this hypoxia impacted the primary habitat of the western school prawn. Abundance in March 2018 was very low compared to pre-restocking levels.

During 2011-2016, DBCA and project partners at UWA and DWER invested considerable resources to develop a spatially resolved coupled hydrodynamic-biogeochemical model, the Swan Canning Estuarine Response Model (SCERM).

The model is a useful tool that can be used for predictive purposes as well as display. The SCERM model has the capacity to complement, but not replace, regular water quality monitoring and to simulate and display information on a wider spatial scale and over finer temporal resolution than the existing weekly water quality reporting. A display portal was developed as part of this project which enhances existing communications with the community about river conditions and creates new opportunities to present 'interpreted' outputs of more relevance to management and outreach. Model outputs continue to be applied to management application and tested using new data.

The Swan Canning Acoustic Array (SCAA), which consists of 30 acoustic receivers deployed throughout the Swan Canning estuary, provides valuable information on fish movements relative to water quality, dissolved oxygen concentrations, particularly within the zone influenced by the Swan oxygenation program and major in-river barriers, such as the upgraded Kent Street Weir and fishway. Since being deployed in 2016, the SCAA has tracked the movement of 120 black bream within the estuary.

Objective 5: Maintain and improve sense of place with the Riverpark

12. Increase community understanding and engagement with natural and cultural heritage

Action	Status	DPLH/ Aboriginal Affairs	DBCA	Heritage Council
12.1 Assess, recognise and protect sites with a high level of cultural heritage significance **(P)**		●	●	●
12.2 Develop interpretive and educational opportunities incorporating the cultural resources of the area			●	
12.3 Provide publicly accessible information and maps detailing important cultural and natural sites and structures in the Riverpark			●	
12.4 Work with relevant Noongar groups to manage the Riverpark **(P)**			●	

Assessment, recognition and protection of sites

DBCA received formal exemption or consent from the Registrar of Aboriginal Sites DPLH, under regulation 7 and 10 of the Aboriginal Heritage Regulations 1974 to build the Matilda Bay interpretation node.

Recording audio stories from Noongar elders for the River Journeys interpretation nodes

Interpretive and educational opportunities incorporating culture

DBCA is continuing to recognise and promote Aboriginal and other cultural heritage though the Riverpark Trails Project. Six specific interpretive nodes have been created with more being planned. Nodes include seating, artwork and information incorporated into structures as well as audio trail guides available via the GeoTourist App. Further implementation of both the *marli riverpark Interpretation Plan* and the *Riverpark Trails Masterplan* are being planned. Trail guides are also being developed.

DBCA completed another interpretation node at John Tonkin Park in East Fremantle and the node at Kent St Weir is nearing completion. The Department also received funding from Woodside, through the WA Parks Foundation, to develop another three interpretation nodes at Matilda Bay, South Perth and Deep Water Point.

Publicly accessible information

DBCA has a range of information available to the community on exploring the Riverpark through the Explore Parks WA website. The link is provided below. The site provides maps as well as links to a range of information sources. People can also access information on Aboriginal history, the social, political and environmental history of Perth Water, stories by the community and links to trail guides.
https://parks.dpaw.wa.gov.au/park/swan-canning-riverpark

Trail guides for the Melville Water Riverpark Trail (a 16km urban trail along the river) from Fremantle to Canning Bridge and the Jenna Biddi Yorga trail (a 2km walk) from Point Walter to Blackwall Reach are provided via the GeoTourist app and the Trails WA website. The links are provided below.
http://trailswa.com.au/trails/jenna-biddi-yorga
http://trailswa.com.au/trails/melville-water-riverpark-trail#

Working with Whadjuk Noongar traditional owners

DBCA actively works with Whadjuk Noongar traditional owners to manage the Riverpark. As many projects are operationally delivered by partner organisations, DBCA actively encourages its project partners to maximise opportunities for Aboriginal involvement in projects and activities.

For the interpretation node projects, South West Aboriginal Land and Sea Council (SWALSC) endorsed and DBCA obtained information and stories for the nodes from Doolann-Leisha Eatts and the Sister Kates Mission for the Kent Street Weir node. Trevor Walley was engaged for the Matilda Bay and South Perth interpretative nodes, and Noel Nannup for the node at Deep Water Point.

DBCA works closely with Whadjuk elders for a number of key trail and interpretive projects, where oral recordings of the cultural values of the Riverpark are captured. The recordings are available on the Explore Parks WA website, as well as on the Geotourist app so Riverpark visitors can listen to the stories. Aboriginal input to, and information for the nodes was obtained from Doolann-Leisha Eatts, Trevor Walley and the Sister Kates Home Kids Aboriginal Corporation.

DBCA is the State government representative on the project steering committee for the UWA Clean Air and Urban Landscapes Hub's 'Reconstructing an understanding of Noongar knowledge for the Swan-Canning catchments – implications for land-use and water planning in Perth' research project. This is a Noongar-driven project that aims to determine a process for the collection, storage and culturally appropriate access of Noongar knowledge to guide land use and water planning in Perth.

Objective 6: Provide access and a safe environment for Riverpark visitors

13. Maintain and improve safe access for Riverpark visitors

Action	Status	DBCA	DPLH	Local Govt	DoT	DoH
13.1 Promote public use and enjoyment of the Riverpark **(P)**		●				
13.2 Maintain and improve the level of safe public access to and along foreshore areas in the Riverpark **(P)**		●	●			
13.3 Improve access to public/courtesy moorings and short-stay pens		●			●	
13.4 Implement a rational management system for dinghy storage on foreshore areas				●		
13.5 Facilitate safe use of vessels on waterways – maintain navigation aids in the Swan and Canning rivers to facilitate safe passage through the navigation channels **(P)**					●	
13.6 Coordinate primary contact water quality monitoring at popular swimming locations and report conditions to the community **(P)**						●
13.7 Develop a Shared Asset Management System to link funding/assets/damage to enable forecasting and prioritising of foreshore improvement works		●				
13.8 Implement works to stabilise the riverbank where valuable infrastructure or recreational amenity is threatened by erosion **(P)**		●			●	

Promotion

DBCA promotes events, activities, projects and other ways to enjoy the Riverpark through the River Guardians projects and social media. Internal and external events, activities and projects run by Non Governmental Organisations (NGOs) and community groups have been promoted through the River Guardians website, Facebook page and Instagram account. Additional information on activities undertaken to support community enjoyment of the Riverpark and the River Guardians program can be found under Strategy 17 of this report.

Riverpark access

DBCA develops and implements visitor risk management assessments and plans for areas of shared responsibility within the Riverpark to ensure safe public access and enjoyment. This includes inspections, assessments and the mitigation of hazards where necessary. DoT also conducts bi-annual inspections of courtesy moorings to ensure that the Riverpark remains safe and accessible for the boating community.

DBCA supports planning for future foreshore lands and redevelopment of existing public parks and reserves through strategic planning processes, including precinct planning and the land and waterways use plan, which is currently being reviewed and updated. These support ongoing community access to the rivers.

DPLH is continuing its program of land acquisitions to consolidate the Swan and Canning river foreshores and the provision of river management, public access and facilities. Land is acquired either by purchase or through the subdivision process by relevant development conditions. Land acquired is usually transferred to a land manager such as a local government to become part of the local parks and reserves system available for community use and access.

DPLH/WAPC provided $250,000 funding for a hydrological study of Ashfield Flats and restoration of this important floodplain. DPLH also spent $4.3 million to stabilise the Rivervale foreshore, removing weeds and revegetating the escarpment and completed the first stage of rehabilitation of a contaminated site (landfill) on the Swan River floodplain in Bayswater.

Courtesy mooring access and dinghy storage

DBCA provides a number of courtesy short-stay moorings in the Riverpark throughout different mooring zones to allow recreational users to safely moor in different locations. Courtesy moorings are moved, as required.

Dinghy storage has been an issue affecting Riverpark access. Dinghies on foreshores restrict the ability to move through the park as well as access beaches and the waterline. Abandoned dinghies create a hazard and visual amenity problem as well as contributing to erosion and destruction of foreshore vegetation.

Following an extensive collaborative program there are now only two local government authorities that are finalising a management storage system for dinghies on the foreshore. These are the Town of Claremont and the Town of East Fremantle. The Town of East Fremantle has worked with DBCA and local residents to develop a policy. The Town of Claremont to date has proposed a dinghy storage methodology, which is being implemented.

Dinghy storage system in Mosman Park
Photo: Mark Thornley

Vessel use

DoT undertakes education and compliance of the *Western Australian Marine Act 1982* and *Navigable Water Regulations 1957* through regular education programs and compliance patrols throughout the Riverpark. During the reporting period, DoT undertook 309 education and compliance patrols in the Riverpark, including two joint patrols. In addition, DoT undertook six education campaigns specifically related to the Riverpark and delivered six safety presentations at Riverpark yacht clubs.

DoT maintenance contractors undertook maintenance of all 266 navigational aids in the Riverpark. DoT replaced 10 existing wooden Aids to Navigation (AtoN) with new steel AtoN. The replaced AtoN were also identified as being unserviceable during asset inspections. There were 37 AtoN outages of various nature reported and attended to.

Health monitoring

DoH coordinates and supports microbiological water sampling activities conducted by local government authorities within the Riverpark. In addition to regular monitoring, sampling activities were undertaken in response to the Alexandrium algal bloom event in April-May 2019.

Asset management

Riverbank condition data has been finalised by updating of the foreshore reserve useability data and re-analysis of riparian ecology data sets. The riverbank condition data documents type, extent, condition and value of the entire 330km of the Swan Canning natural and built shorelines, riparian ecology priorities and useability of public reserves. It enables analysis of shorelines via asset management systems, asset-threat-response models, and social impact assessment of facilities. Riverbank funding decisions now benefit from up-to-date data collation, immediate priority identification and clear risk communication; all assisting in demonstrating value for money investment. Riverbank, in a collaborative project with Landgate, will soon be making this data available to foreshore land managers via the State Land Information Platform (SLIP).

Infrastructure and amenity protection

DBCA maintained the Riverpark's amenity through its annual program of removing rubbish and dumped materials, reshaping eroded beaches, foreshore protection works and responding to incidents such as fish kills, algal blooms, injured wildlife, sewage spills and other pollution events.

DBCA provides funding towards riverbank rehabilitation and protection in conjunction with foreshore land managers through two schemes – the Riverbank Grants program and the Proactive Funding Scheme. In August 2019-20, $1 million was provided under these programs to fund 12 priority riverbank projects across 10 foreshore land managers to help protect, improve and manage Riverbank areas of the Swan and Canning rivers.

These projects ensure that the Riverpark's shorelines are protected from erosion to help preserve on-shore infrastructure such as paths, parklands and roads. Natural and built foreshore works also improve local amenity, support community access to the waterways and improve local habitat for biodiversity.

DoT receives submissions annually from facility managers seeking to access funding through the Recreational Boating Facilities Scheme. Two projects were completed in the 2018-19 financial year for the City of Melville including the Deepwater Point boat launching facility upgrade and the Point Walter boat launching facility upgrade with grant funding totalling $1.195M.

14. Manage public use requirements to minimise conflicts

Action	Status	DBCA	DoT
14.1 Implement *Aquatic Use Review and Management Framework* for the Riverpark **(P)**		●	●

Managing public use

DoT is currently undertaking an Aquatic Use Review of the upper reaches of the Swan River (upstream of Windan Bridge). This follows the major Aquatic Use and Management Framework Review jointly undertaken by the Trust and DoT in 2011. Several critical changes were made to use on the river including changes to speed limits and some special use areas to ensure more equitable and safer sharing of the river between user groups. The Aquatic Use Management Framework operational working group continues to consider additional minor amendments to speed limits, gazettals, and activities as needed to ensure the safety of users, the stability of the foreshores and infrastructure.

Transport completed a minor aquatic use review within Matilda Bay during 2018. The major outcome of this review has resulted in the implementation of an eight knot speed restriction in all waters of Matilda Bay for vessels over 10 metres.

15. Enhance the standard of Riverpark facilities

Action	Status	DoT	DBCA	Local Govt	Development WA
15.1 Improve quality of existing public facilities and infrastructure		●	●	●	
15.2 Establish a Swan Canning Riverpark Trails project including walking, cycling and kayaking trails			●		
15.3 Improve walking and cycle ways including the implementation of the Recreational Shared Path Network along the rivers as set out in the *Western Australian Bicycle Network Plan*		●			●

Improve quality of existing facilities and infrastructure

DoT administers the Recreational Boating Facilities Scheme (RBFS) with funding obtained primarily from boat registration fees. Funding can be used for enhancing the safety of recreational facilities, maintaining a clean and healthy environment, improving access, and upgrading boating facilities including jetties, navigational aids, and courtesy moorings. DBCA is a member of the assessment panel supporting DoT in assessing applications for the RBFS. Sandy Beach Reserve Jetty received funding for planning and design for replacement and design in 2019-20, to a value of $15,000.

DoT also undertook annual maintenance and modifications to its infrastructure including Riverpark jetty deck replacements as a part of rolling program, Coode Street jetty repair work, Como jetty repair work, Mardalup-Claisebrook jetty refurbishment and newly constructed Burswood jetty's regular monitoring and maintenance. Regular ongoing monitoring and engineering inspections of Barrack Square Jetty 1 is now in place. DoT is currently negotiating with Old Perth Port, in conjunction with Development WA and DBCA, to redevelop jetty 1.

Local governments are important contributors to Riverpark facilities. In the last 18 months, the following work was undertaken by local governments:

- The City of South Perth implemented *Connect South* encompassing the Mends Street Jetty foreshore, Mends Street, Harper Terrace and Windsor Park. This project focused on improving public amenity via place activation, wayfinding, access to transport and greater economic opportunity. Notable additions to the foreshore landscape included huge frill neck lizard and numbat sculptures.
- The City of Swan implemented the Woodbridge foreshore upgrade. The riverside area has been a favourite spot with locals for many years and is now complemented with foreshore protection, an overwater viewing platform and shaded picnic facilities and a perfect spot to launch a kayak or canoe for a paddle on the river.
- The City of Nedlands have opened the popular Jo Wheatley *All Abilities Play Space*, a new purpose built park for all ages and abilities. Carefully built around and under existing trees, the park offers foreshore access, wheelchair access throughout, a sensory garden, adventure play equipment, toilet facilities and is fully fenced.
- Co-contributions for interpretation nodes at John Tonkin (East Fremantle) and Kent Street Weir (Canning).

This list is representative and does not include all works undertaken by the 20 local governments in their ongoing work in providing community facilities and services.

Riverpark Trails project

Implementation of the Riverpark Trails project is continuing, with six interpretive nodes constructed to date. Planning is underway for new interpretation nodes at Matilda Bay, South Perth and Deep Water Point with the Kent St Weir node to be completed in April 2020.

The Trails project supports the development of new or upgraded walking/cycling trails around the length of the Riverpark with interpretation nodes being placed at critical points. These nodes highlight Aboriginal, social and natural heritage features of the relevant river destination area. Contemporary technology is providing a unique trails experience with users able to access audio recordings via the GeoTourist app. Riverpark visitors can also hear stories and explanations from Aboriginal elders about the local landscape and its significance.

Riverpark Trails interpretation node at Bicton

Improve walking and cycle ways including the Recreational Shared Path network.

DoT has a variety of activities aimed at delivering improvements to shared paths including maintenance of existing networks and planning, scoping and constructing new networks.

The long term planning for the cycle network in line with the *Transport @ 3.5 million Perth and Peel Transport Plan* is ongoing. DoT is currently consulting with the 33 local government authorities involved to produce an agreed cycle network. This process will be completed in June 2020 and identifies a number of river and lake crossings.

Initial development (feasibility study) work for a Principal Shared Path (PSP) on the east side of the Kwinana Freeway has been completed. A feasibility study to improve the PSP on the west side of the Kwinana Freeway from Cale St to Mt Henry has also been completed. Transport has identified this path for possible funding as part of PSP prioritisation 2022-2031. A review of lighting along the existing PSP from the Narrows Bridge to Mt Henry is also underway. Current planning has the first priority for works earmarked for the PSP section between the Narrows Bridge and Canning Bridge.

16. Promote appropriate tourism activities

Action		Status	Local Govt
16.1	Support community events (e.g. Skyworks, river festivals, Swanfish) and tourism opportunities on the river foreshore **(P)**		●

Community events and tourism

Community events are held throughout the year within the Riverpark. DBCA continued to support a variety of key community Riverpark events including the Matilda Bay Swim Thru, Skyworks, the Canning River Festival, Swanfish, the Algal Bloom yacht race, Avon Descent, Clean Up Australia Day, *Reel It In* Fishing Line Bin project clean up days, free RiverWise gardening workshops and a variety of scuba dive club underwater clean ups in the Swan River. These events are promoted and supported by DBCA's River Guardians program. Local government participation in the planning and coordination of these events is instrumental to their success.

Visitor satisfaction across the Riverpark

A Visitor Satisfaction Survey was undertaken to gain valuable information and data on community feedback. The perceptions of the Riverpark's users and visitors was undertaken during the December 2019 school holidays. The average satisfaction at all of the 10 sites exceeded the 85% target set, with an achievement of 90.9% based on 234 interview respondents.

Objective 7: Improve public knowledge and understanding of the Riverpark

17. Facilitate opportunities for engagement with the Riverpark

Action	Status	DBCA	DLGSC
17.1 Promote opportunities for community groups and individuals to be involved in on-ground conservation activities **(P)**		●	
17.2 Facilitate opportunities for local community groups, agencies, educational institutions and volunteers to be involved in research, behavioural change and sustainable living programs/projects		●	
17.3 Support local environmental groups to source additional funding **(P)**		●	
17.4 Promote active and healthy lifestyles that encourage the use of the Riverpark			●
17.5 Promote Riverpark identity through the media and major public and corporate events occurring in the Riverpark		●	

On-ground conservation opportunities

DBCA assists landholders in implementing on ground activities that will improve soil health and contribute to improved water quality in the Swan-Avon river system.

DBCA and the Trust have been supporting regional and local natural resource management (NRM) groups within the catchment for over 20 years, providing financial aid, technical support and advice as well as support to access various external funding sources. DBCA supports three sub regional groups – SERCUL, Ellen Brockman Integrated Catchment Group (EBICG) and the Eastern Hills Catchment Management Program (EHCMP).

DBCA via Burswood Park Board funding, also provides remuneration for officers based in sub-regional NRM groups. Funding of $610,000 was provided to sub-regional NRM groups during 2018-19 to coordinate community projects that improve the water quality entering the river system.

Round two of the State Government's Community Rivercare Program (CRP) provided $300,000 funding to nine community volunteer groups during 2018-19 to deliver projects that address water quality improvement, foreshore restoration and habitat creation in waterways of the Swan NRM region. Recipient groups have local knowledge, experience and volunteer resources to complete restoration projects throughout the Swan Canning river system.

The Trust, DBCA and the Burswood Park Board have had a long-term partnership with Alcoa and Perth NRM for the Swan Alcoa Landcare Program (SALP). Since the partnership began in 1998, with funding support from the Burswood Park Board, Burswood Crown and the Australian Government, the Trust, and DBCA have invested more than $4.25 million into the program. DBCA has worked closely with Alcoa and Perth NRM to secure ongoing commitment and funding for this iconic and critical community program.

Local community groups are integral in undertaking work to improve the ecological and community benefit of their areas and often work in conjunction and with the support of local governments and DBCA.

SALP site Brentwood main drain planting. Photo: Mark Thornley

Land management strategy

The land management strategy for the upper Canning River was delivered along a section of the Canning River between Burslem Drive, Maddington and Royal Street, Kenwick. This initiative helps to identify any unlawful structures and activities along the Canning River foreshore and helps to resolve a variety of stakeholder issues.

Facilitate opportunities for community involvement in research, education and behaviour change

Several community engagement and education projects were undertaken to support behaviour change and citizen science for the Swan and Canning rivers. Projects are delivered under the River Guardians banner.

The River Guardians program funded by DBCA continues to promote the Riverpark and provide opportunities to engage with various initiatives, activities and events. The program has 2917 subscribers. Volunteering opportunities are offered through Dolphin Watch, Fishing Line Bin project, river clean ups and planting opportunities.

DBCA and the Trust continue to deliver two innovative citizen science programs:

Dolphin Watch – supporting improved understanding of the Indo-pacific bottlenose dolphin sub population that visit the Riverpark on a daily basis; and the Reel it in Fishing Line Bin project.

The Dolphin Watch citizen science research project continued to be delivered in Perth and was expanded to Mandurah and Broome during 2018.

The Department trained and registered 76 new Dolphin Watch volunteers. There were 2845 dolphin monitoring reports submitted, and volunteers contributed 2022 hours. Junior Dolphin Watch engaged with 150 students from five schools.

Case Study: RiverWise Gardens program

RiverWise gardening consult in priority nutrient suburb

A priority nutrient input catchment in Bull Creek was selected for the 2019 RiverWise Gardens program. The behaviour change program engaged 3000 households and personally contacted 600 households. This targeted behaviour change program deployed a personalised coaching approach for residents combined with on-site garden consultations, feedback letters and referrals to a gardening workshop.

The coaching team talked to 412 households and participants who agreed to more than 700 RiverWise actions. The program recruited higher fertiliser users (30 per cent of participants) into the garden consultation service, completing 97 garden assessments. A further 147 participants attended a special RiverWise gardening workshop delivered by ABC's Gardening Australia presenter, Dr Josh Byrne.

DBCA funded six RiverWise gardening workshops in priority catchments throughout the Perth metropolitan area to encourage sustainable gardening practices including responsible fertiliser use. The program reached 889 people at an average attendance rate of 99 people per event.

These informative and interactive workshops help community members learn sustainable gardening practices to save time, money, water and nutrients whilst attracting birds and wildlife to Perth residential gardens.

Support groups to source funding

DBCA financially supports NRM sub-regional groups to increase capacity within those organisations to maintain community capacity across the catchment. This enables the development of water quality improvement projects with community groups and assistance in applying for grants.

Promoting active, healthy lifestyles

DLGSC provides support via the Organisational Sustainability Program to state sporting and recreation organisations such as Canoeing WA, Yachting WA, WA Water Ski, WA Power Boat, Rowing WA, Triathlon WA, and Outdoors WA. In 2018-19, DLGSC provided $1.06 million funding to more than 12 state sporting and recreation organisations who use the Riverpark for all or some of their sport and recreation. More than 100,000 people were recorded as association members or as participants in organised events.

DLGSC is involved in the development and maintenance of sport and recreation facilities through the Community Sporting and Recreation Facility Fund. Past funding has assisted with facility development in various Riverpark locations including Ascot Kayak Club, Swan Canoe Club at Mosman Beach and the WA Watersports Facility at Burswood.

DLGSC also finances the State Sporting Infrastructure Fund. DLGSC continues to improve sport and recreation facilities via investment in the maintenance of the Rowing WA headquarters. Funding was provided for the project management component of a foreshore stabilisation project following damage caused by winter storms to the riverwall and riverbank next to the Rowing WA headquarters.

DLGSC continued to promote river-based activities at its Point Walter campsite with over 3555 participants (5330 participation hours) engaging in water-based river recreation. DLGSC continues to support action 17.4 via in kind support for the linkage of the International Commonwealth Walkway trails project to the Swan River at the Optus Stadium, Elizabeth Quay and Fremantle Port precincts.

DLGSC also funded a Preston Point Road North Sporting Facilities Masterplan in East Fremantle.

Promoting the Swan Canning Riverpark identity

DBCA officers provide articles and various contributions for Landscope magazine (community engagement and citizen science projects), West Australian Newspaper (the Riverpark), Boating WA's magazine Flagship (fishing line bins), and Community Newspapers (vegetation protection, seaweed accumulation on foreshores).

DBCA continued to support popular community riverfront events and activities including Swanfish, the Canning River Festival, kayak raft ups, Avon Descent, Perth Skyworks, Matilda Bay Swimthru and a variety of river foreshore and underwater dive club cleanups.

DBCA also hosts the River Guardians community program website, Facebook page and Instagram account to keep the friends of the Swan and Canning rivers involved and informed of local happenings.

Swim Thru event crowd at Matilda Bay
Photo: Mark Thornley

Objective 8: Improve the way we do business

18. Support appropriate development and businesses through a planning and policy framework

Action		Status	DBCA
18.1	Identify nodes for developing appropriate commercial opportunities in the Riverpark **(P)**		●
18.2	Ensure all commercial operators in the Riverpark meet high standards through licensing **(P)**		●
18.3	Ensure River reserve leases are managed in line with policy to best practice standards **(P)**		●

Commercial opportunities

The river is an iconic part of Perth and the Perth lifestyle and future commercial offerings should reflect what the Perth community values about the river. Recent public consultation strongly emphasised that the community favours a focus on Perth's unique cultural values and its environmental distinctiveness. This includes opportunities around Noongar cultural experiences, events and pop-up installations that showcase innovative or seasonal offerings, and nature-based tourism.

DBCA is open to commercial opportunities that are sensitive to the unique Swan and Canning rivers and has worked with commercial operators to ensure businesses contribute to the community benefit and long-term community use and enjoyment of the river without adversely affecting the ecological health and amenity of the river system. The range of activities recently approved or operating on the rivers includes:

- Seaplane tours (initially via a trial)
- Self-drive boat hire
- Floating event venue
- Charter vessels
- Permanent over water food and beverage outlets
- Permanent food and beverage outlets on foreshore
- Canoe/kayak hire and tours
- Ferries
- Kite and wind surfing lessons
- Stand up paddle board lessons and hire

Following conclusion of the seaplane trial, and gauging of the community's views on the use of Perth Water for commercial seaplanes, DBCA intends to licence an operator that demonstrates a contribution to the long-term community use and enjoyment of Perth Water and preservation of the ecological health and amenity of the Swan Canning river system. Strict safety, environmental and amenity conditions will be required to be adhered by the operator.

Sunset sea kayaking on the Swan River
Photo: Jane Hilton

Commercial operators

DBCA is responsible for approving the operation of commercial operations within the Riverpark. DBCA balances the need to preserve, protect and manage the River as a public space on behalf of the community whilst supporting suitable commercial operations that contribute to the use and enjoyment of the river and enrich visitor experiences.

The variety and number of proposed commercial operations within the Riverpark continues to grow. From July 2018 to the end of 2019, 56 tourism operator licences were approved on the Swan and Canning rivers plus another 24 aquatic activity licences. A significant number of additional commercial operators were approved to use the foreshore, primarily for pop-up food and beverage outlets. Events and pop-up installations are becoming increasingly popular.

DBCA has also been working with Tourism Western Australia within its case management framework and provided advice into the Matagarup bridge climb, zipline and access pod proposal, Tawarri hot springs and a seaplane operation Expression of Interest for the Swan River.

River reserve leases

DBCA issues leases for development activities where permanent or semi-permanent structures are placed on or in the River reserve. Examples of developments requiring River reserve leases include jetties, marinas, over-water restaurants, and boat sheds.

DBCA actively works with lease holders on environmental management of their facilities including the use of environmental management systems to ensure that nutrients, sediments, contaminants and rubbish are prevented from entering the river system.

19. Engage effectively in the statutory decision making process

Action	Status	WAPC	DBCA	Local Govt	DevelopmentWA
19.1 Provide clear guidance consistent with SPP 2.10 to developers of land adjacent to the foreshore **(P)**		●	●		
19.2 Apply water sensitive urban design principles and other existing DBCA/Swan River Trust policies and guidelines		●		●	●
19.3 Continue to collaborate on the development of precinct plans to support riverside development			●		

Providing guidance

DBCA and WAPC/DPLH continue to apply policies, such as State Planning Policy 2.10, and relevant planning instruments, such as structure plans, to their assessment of development applications and subdivisions in and adjoining the Swan Canning Development Control Area. These policies ensure consistent, critical advice and assessment is provided to proponents.

From July 2018 to the end of 2019, DBCA officers provided advice on 266 development and subdivision applications that were in, next to, or affecting the Swan and Canning rivers applying State and DBCA policy objectives.

DBCA provided ongoing advice on river protection and foreshore enhancement matters for major projects of State significance on and around the Swan and Canning rivers, including the Matagarup Pedestrian Bridge and DevelopmentWA projects at East Perth, Elizabeth Quay, Midland and Armadale. Advice was also provided on major redevelopments at the Belmont Racecourse precinct and within the Canning Bridge Activity Centre.

DBCA provided comments on the Local Government Guidelines for Subdivisional Development (Department of Planning, Lands and Heritage and the Institute of Public Works Engineering Australasia) that are undergoing a review.

Apply water sensitive urban design and other policies

Water sensitive urban design (WSUD) is an approach for minimising the impact of urbanisation on the natural water cycle and supports integrated water cycle management. For the rivers, WSUD is a critical element in urban planning to maintain and enhance water quality, manage groundwater and surface water interactions and achieve enhanced environmental and community amenity outcomes in urban developments.

DBCA provided assessment support and advice on WSUD application on development applications referred from local governments in 2018-19. WAPC and DBCA also support the application of WSUD through the framework and principles contained in *Better Urban Water Management* (WAPC, 2008).

DBCA continued to resource and support the New WAter Ways program and the CRCWSC, and influence and advocate for the implementation of a water sensitive Perth through membership of the Water Sensitive Transition Network (WSTN). The Vision and Transition Strategy for a Water Sensitive Greater Perth was released by CRCWCS and WSTN and the associated implementation plan was completed by WSTN.

DBCA attended and provided support and information for numerous Water Sensitive Cities index benchmarking and visioning workshops for local governments. These workshops identify the current status of a local government area on its journey to a water sensitive city and identify areas to develop actions to transition to water sensitive cities.

DevelopmentWA is a supporter of WSUD approaches and has worked to incorporate environmental integrity as part of its redevelopment objectives, as well as incorporating WSUD and other sustainability aspects into redevelopment scheme principles, development policies and design guidelines. Proposals are assessed for their compliance with these requirements to achieve improved environmental, sustainability and community outcomes.

Where possible the WAPC endeavours to address legacy drainage infrastructure that is the source of nutrients entering the river system.

Collaborate on locality plans

Several locality plans are being developed throughout the Riverpark. The Perth Water Buneenboro Locality Plan is being developed in collaboration with seven other State agencies and local governments and was released in November 2019 for final public comment. The plan will guide future improvement and development of Perth Water, its foreshores and abutting private development interface. A trial of the use of Perth Water by commercial seaplane operators also continued.

Photo: Courtesy of Swan River Seaplanes

Case study: Perth Water Buneenboro Locality Plan

Perth Water includes some of the most iconic river view scapes in the city as well as premium residential and commercial land along one of the busiest sections of the Swan River with many recreational, tourism, and transport activities all occurring in this space. The aim of the *Perth Water Buneenboro Locality Plan* is to purposefully guide future improvement of the area in a more strategic and proactive manner for the wider benefit of all visitors to the area.

The *Perth Water Buneenboro Locality Plan* is the latest and most ambitious precinct planning project for DBCA. The draft locality plan has developed a strategic vision and guide for the future use and management of Perth Water, the adjacent parks and recreation foreshore reserve and the development interface.

The Perth Water Precinct – the section of the Swan River and its foreshore between the Narrows and Windan bridges – is evolving with several major projects underway, increasing visitor numbers, and a growing interest for tourism and commercial ventures. Given the significance of Perth Water, a draft locality plan was developed to guide future improvement of the precinct, its foreshores and abutting private development interface in a strategic and proactive manner for the wider benefit of all visitors to the area.

The locality plan sets a framework to determine acceptable developments (including uses) for the area based on defining landscape characteristics, community aspirations and environmental and cultural values. Considerations within the Plan include recreation, commercial nodes, public access, facilities and services infrastructure, foreshore protection, and environmental enhancement and management.

The development of *Perth Water Buneenboro Locality Plan* has been overseen by the Perth Water Vision Group, which comprises eight State and local government agencies including City of Perth, City of South Perth, DBCA, DPLH, DoT, DevelopmentWA, Tourism Western Australia and the Town of Victoria Park.

The draft *Perth Water Buneenboro Locality Plan* was developed in close consultation with the community with a wide range of ideas captured in the Plan. To prepare the plan DBCA engaged a diverse range of stakeholders, including the Whadjuk community and community groups active in the area. The draft locality plan was completed in November 2019 and received over 50 submissions.

The locality plan reflects the aspirations of the broader Perth community and the five State agencies and three local government authorities involved in managing this section of the river. This shared vision will ensure coordinated decision-making across government, streamlined approvals processes and will help create a vibrant Perth Water precinct.

Optus Stadium from Claisebrook Cove
Photo: Mark Thornley

20. Continually improve the statutory approval process

Action	Status	DBCA	DPLH/Aboriginal Affairs	Local Govt	DevelopmentWA
20.1 Review regulations and legislation to improve efficiency of the statutory assessment process **(P)**		●			
20.2 Support implementation of Aboriginal Heritage Protocol to obtain A*boriginal Heritage Act 1972* approvals for conservation works in the Riverpark		●	●		
20.3 Monitor approvals and enforce compliance with development		●		●	●

Legislation and policy

A key objective of the *Swan and Canning Rivers Management Act 2006* is to provide for the management of activities that affect the ecological and community benefits and amenity of the Riverpark. The volume of applications submitted to DBCA continues to be high with increasing requests for expedited assessments. From July 2018 to the end of 2019, DBCA's Rivers and Estuaries Branch issued more than 351 approvals for works or activities in the Swan Canning Development Control Area.

Six developments wholly within public foreshore or waters were assessed under Part 5 of the *Swan and Canning Rivers Management Act 2006* and determined by the Minister for Environment. A further three amendments to Part 5 approvals were granted by the Minister for Environment.

DBCA has been working with DPLH on a review of State Planning Policy 2.10: Swan-Canning River System and State Planning Policy 2.9 Water Resources and associated guidelines to ensure that activities, land use and development maintain and enhance the health, amenity and landscape values of the rivers, including recreational and scenic values.

To complement the State Planning Policy review, DBCA is updating the *Swan River System Landscape Description* document to accurately capture current contextual information for the Swan and Canning rivers. Once updated, the landscape description document will be an important resource when developing, as well as assessing, proposals.

DBCA updated its guidelines 'Scientific Studies: Applying Regulation 16C' and 'Variation or Extension of Approval: Applying Section 84' to increase efficiencies and provide further clarity to proponents.

DBCA provided comments on the Draft Precinct Design State Planning Policy and Guidelines (WAPC and DPLH) to improve incorporation of water sensitive urban design approaches and to improve protection of the Swan Canning river systems.

Implementation of Aboriginal Heritage approvals

DBCA has not initiated any projects requiring heritage approval and continues to advise partner organisations when projects should seek approval. DBCA is resourcing and supporting, through membership on the project steering committee, a UWA/clean air and urban landscapes hub project on Reconstructing an understanding of Noongar knowledge for the Swan Canning catchment – implications for land-use and water planning in Perth.

DBCA is committed to recognising and preserving Aboriginal heritage in all areas of the State.

Compliance

DBCA continues to monitor works around the Riverpark, and aims to assist other approvals authorities with advice on compliance of their conditions. There is an increasing trend to obtain detailed information through conditions of development approval, for example dewatering management plans. DBCA continues to work closely with other approval authorities to ensure that the objectives of State and DBCA policies are being achieved.

DevelopmentWA has continued to work with developers on major projects including Elizabeth Quay, Waterbank, Midland and Wungong Urban Water Project to achieve agreed WSUD and environmentally sustainable outcomes. Approved developments at Elizabeth Quay must demonstrate Australian Best Practice 5 Star Green Star design and dewatering management plans.

21. Identify and attract new sources of investment to achieve greater management outcomes

Action		Status	DBCA
21.1	Develop mechanisms for attracting private sector financial support for conservation and community projects through corporate partnering		●
21.2	Investigate opportunities to diversify and increase investment in the Riverpark		●

Attracting private sector support and new investment

DBCA coordinates grant applications and promotes key river management and restoration projects to Federal government, State government, local government, private enterprise, philanthropists and foundations to help secure external income streams to support Riverpark objectives.

DBCA is actively supporting the newly established WA Parks Foundation and is no longer pursuing a separate Swan Canning Rivers Foundation. The Riverpark trails network is part of a series of proposed projects that the WA Parks Foundation is working to secure private and corporate support and funding to implement.

The Trust, DBCA and the Burswood Park Board have had a long-term partnership with Perth NRM and Alcoa for the Swan Alcoa Landcare Program. Since the partnership began in 1998, with funding support from the Burswood Park Board, Burswood Crown and the Australian Government, the Trust, and DBCA has invested more than $4.25 million into the catchment restoration program.

DBCA has worked closely with Perth NRM and Alcoa to secure ongoing commitment and funding for this iconic and critical community program that has leveraged a further $8 million of matched funding for on-ground catchment restoration projects since its inception.

In December 2019 DBCA successfully attracted $22,000 in funding support from DPIRD to expand the *Reel It In* Fishing Line Bin project statewide.

Leases

The *Swan and Canning Rivers Management Act (2006)* makes provision for the Trust to grant a lease of land that is part of the river reserve. A number of leases are in place within the river reserve and are currently managed by DoT which is responsible for the *Marine and Harbours Act (1981)*, as an agent of DBCA. These river reserve leases are mainly with yacht clubs, marinas and some restaurants. The revenue derived from these leases is credited to DoT and contributes to the maintenance, replacement and management of the public jetties in the Swan and Canning rivers.

DBCA as the landlord and lessor actively has oversight, monitoring, commercial input and other engagement with the lessees on a continual basis to ensure appropriate management of the lease. This includes environmental management systems to ensure pollutants at lease sites are dealt with adequately and environmental mitigation measures are put in place.

Case study: Reel It In Fishing Line Bins

The *Reel It In* fishing line bin project now has 65 dedicated fishing line bins at popular jetties, fishing platforms, traffic bridges and foreshores throughout the Riverpark. These bins have collected over 111 km of fishing line since 2014 with 27.7km of fishing line collected from the Riverpark during 2019 alone.

Project partner Native Animal Rescue (NAR) emptied the fishing line bins on a weekly basis and more than 50 volunteers have now adopted 36 fishing line bin sites throughout the Riverpark.

DBCA administers the *Reel It In* project by coordinating relevant stakeholder roles and gaining all approvals from local government, relevant government departments and other stakeholders to install and service the fishing line bins.

Photo: Miranda Holker

The fishing line bins are made from 100% recycled materials and are branded with weatherproof stickers (including all stakeholder logos). The units are installed by local councils or shires, approved contractors or DBCA. Installation sites were identified and monitored in conjunction with 12 local riverfront councils and their environmental officers. A further 40 bins have been installed throughout Fremantle Ports, Cockburn Sound, Rottnest Island, Mandurah (Peel Harvey Estuary), Busselton Jetty and Bunbury (currently no collection statistics are available for these bins).

The fishing line bins help reduce fishing line and tackle waste on Riverpark foreshores and waterbird and dolphin entanglements in the Riverpark.

Maintenance for the bins is supplied by DBCA Riverpark officers. NAR currently empty the fishing line bins on a weekly or fortnightly basis in the Riverpark. NAR audit rubbish deposited into the bins emptied exclusively by them, using the Tangaroa Blue datasheet used as part of the Australian Marine Debris Initiative. Rubbish data is itemised in a matrix for analysis by DBCA officers to help inform the management of the project.

New fishing line bins will be emptied by Native Animal Rescue or an alternative 'Friends of Group' (such as Friends of Busselton Jetty or a local and reliable angling club) on a weekly basis. In some instances bins will be emptied by local council/shire rubbish contractors. Bin contents data will be forecasted based on the Riverpark fishing line bin project trial data audited in 2015.

New fishing line bin collection data for the Riverpark is gathered each calendar year and is made available for use by Recfishwest and other project stakeholders with DBCA approval. Positive behaviour change regarding fishing waste disposal has led to an increased knowledge of sustainable fishing practices for recreational anglers and the wider community.

DBCA prepares educational materials for key stakeholders such as Recfishwest and members of the fishing community to inform fishers of the bins' locations, function and project outcomes through e-newsletters, websites, marketing collateral, videos, DVD and print media.

A *Reel It In* community education campaign and key marketing tools will continue to be developed for fishing tackle stores, fishing magazines/television shows and special events.

Pelican Zen
Photo: Sharon Morskate

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

SWAN CANNING RIVERPARK

SWAN RIVER TRUST

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