



# SWAN NRM REPORT 2015 — 2017

Reporting our progress of the Swan  
Region Strategy for Natural Resource  
Management 2015-2020



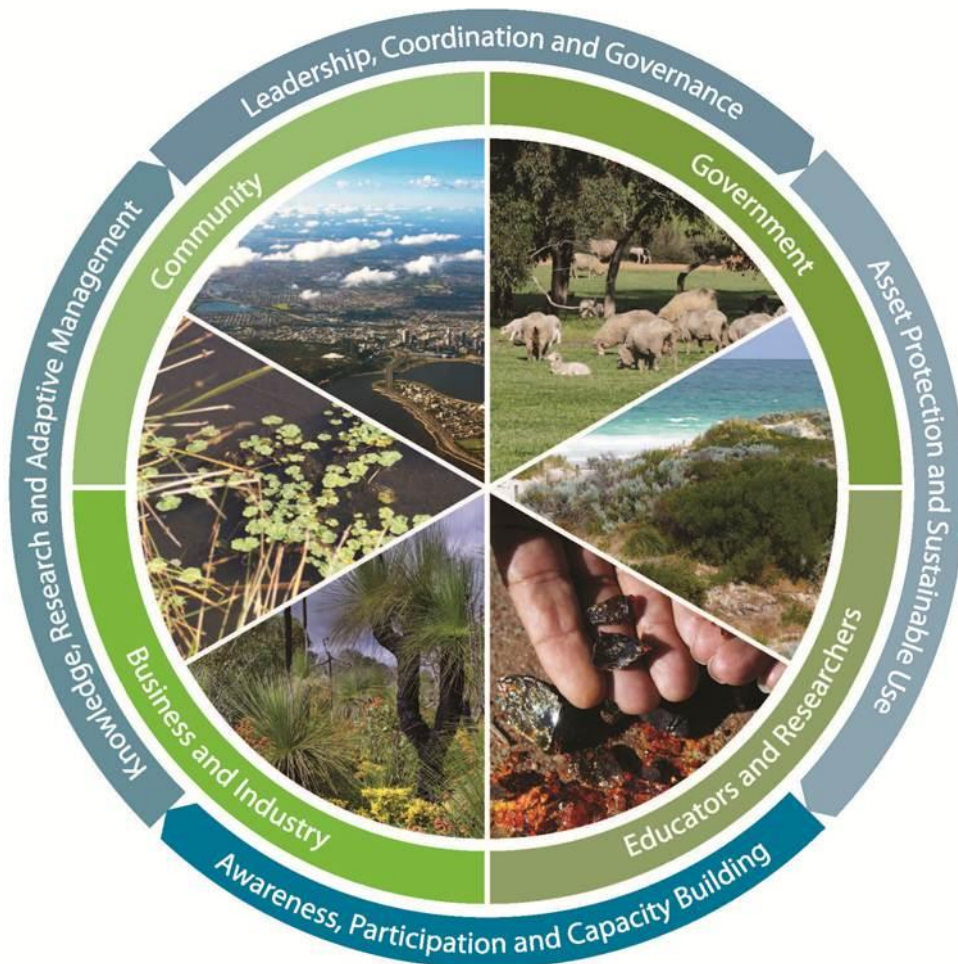


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Strategy for Natural Resource Management  
2015-2020

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Perth NRM prepared this report





Above: The Swan NRM Committee 2015 – 2017

Front Cover: Banksia sp. flower, Kings Park Tree Canopy, Male Carnaby's Cockatoo, Western Australian Christmas Tree Flower, Vineyard in the Swan Region, Volunteer with Dieback Working Group, Banksia sp. foliage, Perth City, Creek, Coastal Planting Volunteers

## Acknowledgements

Perth NRM would like to acknowledge the many organisations who assisted with development of case studies. Their contribution is greatly appreciated. Contributors included:

Australian Institute of Landscape Architects, Department of Biodiversity Conservation and Attractions, Department of Health, Department of Planning, Lands and Heritage, Department of Primary Industries and Regional Development, Department of Water and Environmental Regulation, Eastern Metropolitan Regional Council, Edith Cowan University, Ellen-Brockman Integrated Catchment Group, Murdoch University, South West Group, South East Regional Centre for Urban Landcare, South West Aboriginal Land & Sea Council, State NRM Office, Urban Development Institute of Australia (WA), WA Local Government Association, Water Corporation

## Disclaimer

Perth NRM does not imply or express any warranties regarding the research or findings in this report. The preparation for the report involved gathering and assimilating existing data, project results and other information—including opinions. The facts and opinions reported in this document were obtained by collecting opinions and assimilating data sourced from a range of stakeholders. They are directly relevant only to the purposes for reporting on the progress of the Swan Region Strategy for Natural Resource Management 2015 – 2020. Any interpretations or recommendations given in this document are based on judgement and experience, and not on greater knowledge of the facts, the reported investigations may imply. The information or interpretation contained in this report does not completely discuss all achievements within the Swan NRM Region.

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# Message from the Chair

This Swan NRM Report discusses the progress made towards implementing the Swan Region Strategy for Natural Resource Management (NRM) in the two years since its release in December 2015.

Perth's natural assets continue to be subject to significant, often unavoidable pressure from rapid population growth, urban development, climate change and a variety of other impacts. However, an enormous amount of work continues to be undertaken by individuals, community volunteer organisations, local, state and federal governments, academic institutions, business and industry to better understand, protect and restore the natural environment of Perth and its surrounds.

Importantly, this report was not intended to be an exhaustive review of all NRM activities undertaken in the Region in the last two years or an attempt to quantify the total investment in NRM over that period. Rather it provides a snapshot of a wide range of actions being undertaken by a raft of NRM stakeholders, reporting these achievements against the Strategy's four action areas.

As a consequence, the valuable work being undertaken by many individuals, community organisations, government agencies and businesses does not feature in the report. However I wish to acknowledge and thank ALL involved for the part each plays in the protection and management of our natural heritage and the sustainability of our way of life, and I encourage each to maintain – and hopefully grow - that commitment. The challenges of managing natural assets in a major metropolitan centre means that collective commitment is needed to ensure future generations are able to continue to access and enjoy the natural assets that sustain us today.

I would also like to acknowledge the Swan NRM Committee for their role in facilitating collaboration and cooperation in natural resource management in the region. I also wish to thank all who contributed information to this report and to thank Perth NRM, particularly Jason Pitman, NRM Strategy Coordinator, for compiling the report.

Mr Peter Nash

Chairman, Swan NRM Committee





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Above: A volunteer surveys a local bushland area

# Executive Summary

This report discusses the progress towards implementation of the Strategy and gives a broad overview of achievements under the four action areas. The report will present information on natural resource management currently available and identify the future direction of the implementation plan. The consultation process for this report and a scan of publicly available resources revealed the following regional achievements. Additionally, the same process identified continuing opportunities to improve natural resource management for the Swan Region based on the strategic objectives outlined in the Swan Region Strategy for Natural Resource Management 2015 – 2020.

## **Leadership, Coordination, and Governance**

Direct investment and in-kind support in natural resource management across the Region over the last two years is well in excess of \$110 million each year. This investment came from all three levels of government, business and industry, research and community action. In comparison, the gross regional product for the Greater Perth Region is valued at \$154 billion (REMPAN, 2016) However, regular natural resource management expenditure is difficult to obtain. A scarcity of available information and differing data priorities amongst stakeholders contributes to the challenge.

Coordination of investment continues well in both local and regional scales. There is a growing body of coordinated work across stakeholder groups to improve understanding, prediction and planning relating to cross-boundary issues. While there is a significant level of investment, funding opportunities and long-term funding arrangement are still rare.

## **Asset Protection and Sustainable Use**

The value partnerships provide in maximising return on investment is evident across the region. There is an active pursuit for leveraging funds and in-kind contributions across stakeholders and making effective use of skills and non-financial resources. Community groups, local governments and small-medium sized enterprises continue to identify funding limitation as a significant risk implementing on-ground action to improve sustainability, environmental practise or condition.

Nonetheless, there has been considerable progress in understanding and managing threats to biodiversity, biosecurity, and water resources. This is resulting in many actions to reduce impacts on the environment, water quality and riparian ecosystems. Cross-organisational collaboration also fuels a greater preparedness in climate change adaptation and managing the regions landscapes, communities, and long-term sustainability in the Region.

## **Awareness, Participation, and Capacity Building**

Since 2015, there has been a concerted effort shared between government and non-government organisations to improve capacity for natural resource management within community and industry sectors. Capacity development is a broad spectrum and includes training courses, workshops and field days, capability grants funding, professional and community networking events. Capacity assessments remain crucial to address emerging capacity gaps amongst stakeholders. While capacity development is generally topic-specific, (i.e. weed identification, soil health, urban forestry, community group governance) there is opportunity in supporting mentoring partnerships to foster knowledge and skill transfer among stakeholders.

There is considerable appreciation for the importance of community awareness, engagement. There are over 70 local and regional community groups active within the Swan Region. The relationship between community groups and their local government is proactive and their joint efforts are delivering effective on-ground environmental work. It is inherent for sectors involved in natural resource management to undertake activities to raise community awareness about emerging threats and issues.

Thousands of people receive information and inspiration about the importance of our regions natural and cultural heritage each year. These awareness campaigns are frequent, broad in scope, varied and wide reaching. These can be local such the work achieved by the Canning-River Environment Education Centre, to regional initiatives including the Great Cocky Count. However, there are opportunities to enhance our natural resources in ways where the community can use and appreciate them responsibly fuelling greater environmental awareness.

### Knowledge, Research, and Adaptive Management

Each year, community groups, government agencies, businesses and coordinated multi-partner groups undertake natural resource monitoring across the region. The scope of monitoring activity does range from site specific to catchment scale. The ongoing assessment of natural resource condition (generally asset specific) can provide good baseline data to measure changes. The research undertaken for this report did not assess the comprehensiveness or adequacy of resource condition assessments or monitoring data. However, it did identify a series of opportunity to improve the alignment of monitoring efforts and investigate landscape-scale monitoring arrangements.

Additionally, several research groups and associations are improving knowledge generation and management within different sub-sectors of NRM. There is growing impetus on the importance of timely access to information and analysis relating to natural assets when decision-making, program design and implementation happens across the region.

### Reporting Progress to the Strategy

This is the first report covering 2015-2017 and identifies several areas for further refinement to improve mechanisms for reporting. The aim is to improve management of data about activities and their outcomes. Similarly, the *Current Activities* section of the Implementation Plan, but kept as a catalogue, growing organically with the creation, renewal and cessation of projects and activities.

### Recommendations

1. Develop a consistent reporting framework for the *Priorities for Action* across the natural resource management sector. This will include agreement on definitions, consensus on processes and timelines, and greater clarity on indicators of success for the *Priorities for Actions*.
2. Increase the focus on obtaining resource condition data across the spectrum of natural resources with the purpose of landscape-scale integration. The availability, accessibility and comprehensiveness of baseline and monitoring data continue to be issues for landscape-scale monitoring and remain asset focused.
3. Establish means of consistently monitoring community awareness on environmental issues. While capacity assessments provide valuable insight into the volunteer cohort in the region, awareness can measure the efforts undertaken outside of the conventional natural resource management space.
4. Improve reporting on work undertaken by and with the Aboriginal community to raise awareness of cultural values and Aboriginal engagement in natural resource management.

This Report celebrates some of the achievements seen across the Region over the past two years. This not an exhaustive list, and is a drop in the natural resource management pool. The report does identify is the need for further refinement and direction to address the priorities of action outlined in the Implementation Plan. Together we can ensure our collective responsibilities, efforts and investment can continue the progression of sustainable and effective natural resource management



# Introduction

This report discusses the progress towards implementation of the Strategy and gives a broad overview of achievements under the four action areas. The report will present information on natural resource management currently available and identify the future direction of the implementation plan. It will not be an exhaustive review of all-natural resource management activities in the Region, rather an insight into the wide range of actions as outlined in the *Current Actions* in the Implementation Plan.

The information collation process did not assess the comprehensiveness or adequacy of resource condition assessments or monitoring data. Rather, it was to gather asset condition data where publicly available through annual reports. Desktop analysis from publicly available data supported the development of this report. Where applicable, interviews with stakeholders were conducted to assess the social dimensions for the Strategy including collaboration, partnerships and regional agreement.

This report further contextualises the *Priorities for Action* to enable a clearer direction for natural resource management within the Region. There are significant achievements happening across the region and this report celebrates these. However, to emphasise the gaps in implementation of the Strategy, a review of emerging issues and trends is present throughout. In articulating the achievements and gaps in regional NRM, we again emphasise the long-term vision for natural resource management based on our collective work when the Swan Region Strategy for Natural Resource Management was developed.

## Background

The Swan Region Strategy for Natural Resource Management is a strategic, multi-stakeholder integrated framework, and focussing on natural resource management in the Swan Region. It aims to improve integration and coordination of natural resource management planning and activities, particularly between sectors and agencies. At the time of writing, the Strategy demonstrates best available knowledge leveraging off previous and existing work and developed with community and stakeholder consultation. Strategy aims to engage all relevant stakeholders in the management of the Region's natural resources and emphasise natural resource management as a shared responsibility. These stakeholders include business and industry, research and education institutions, government and the community.

A two-year Implementation Plan operationalised the objectives and directions outlined in the Strategy. The division of the Implementation Plan identified both the activity scheduled for 2015-2017 and a suite of actions to be progressed. Firstly, the *Current Activity* acts as a catalogue of actions undertaken by stakeholders. While this catalogue is comprehensive, it is not exhaustive and lacks information on emerging natural resource activity. Often these activities align to strategic objectives unbeknownst to the deliverer. Secondly, the *Priorities for Action* lists gaps in the implementation of the Strategy. The Swan NRM Committee and several other stakeholders collaborated to identify and prioritise these gaps.



Above: Agriculture within the Swan Region



## Priorities for Action

The Swan NRM Committee named fifteen *Priorities for Action*. These actions aimed to address critical challenges in the region and provide a focal point for collective effort. While these actions are meritorious, the remit behind their development needs readdressing. There is significant opportunity to pursue them with an idea of how to achieve them in the long-term. Currently the ideation around these actions has not happened and they remain up in the air. This report aims to provide greater context for each of these actions, and provide inspiration from current action happening across the Region.

Priority Action	Intended Outcome
<b>Leadership, Coordination and Governance</b>	
1. Promote the use of environmental accounting tools	Environmental accounting tools and information is easily accessible
2. Explore alternative funding models and approaches for increasing funding for natural resource management activities	Options for increasing and sustaining funding for natural resource management activities are identified and applied
3. Enhance the regional NRM model	There is a clear definition of NRM and an agreed understanding of how different organisations fit into the regional NRM model
<b>Asset Protection and Sustainable Use</b>	
4. Develop a Swan Region Ecological Linkages project	A regional network of ecological linkages is protected, managed and restored
5. Advocate for a more coordinated approach to climate change adaptation in the Swan Region	There is a regionally coordinated approach to dealing with and adapting to climate change
6. Promote the use of Environmental Management Systems (EMS) across local government and businesses	There are more organisations and businesses adopting EMS
7. Promote the application and adoption of incentives for private land conservation	Landholders are actively protecting and managing high value natural assets
8. Promote voluntary standards and certification schemes that support environmentally responsible practices	Businesses and organisations are actively adopting environmentally responsible practices and standards
<b>Awareness, Participation and Capacity Building</b>	
9. Support local government authorities to incorporate environmental matters and strategies into local planning schemes	Local government have sound environmental and biodiversity strategies and actively incorporate environmental matters into planning
10. Seek funding to continue the Local Biodiversity Program	There is ongoing financial support for the Local Biodiversity Program
11. Develop a public awareness campaign focussed on sustainability and reducing Perth's ecological footprint	Individuals and businesses are taking action to be more sustainable and reduce their ecological footprint
12. Work with the Whadjuk Regional Body Corporate to increase Aboriginal participation in NRM	Aboriginal people are participating in natural resource management
<b>Knowledge, Research and Adaptive Management</b>	
13. Develop an approach to collating and communicating resource condition information for the region.	The condition of natural assets is monitored and communicated.
14. Review and compile existing asset and risk information to support effective decision making	Ensure all stakeholders in the region are focussed on the same priority assets and risks
15. Develop regional research priorities that target critical NRM knowledge gaps	Research is focussed on critical NRM knowledge gaps

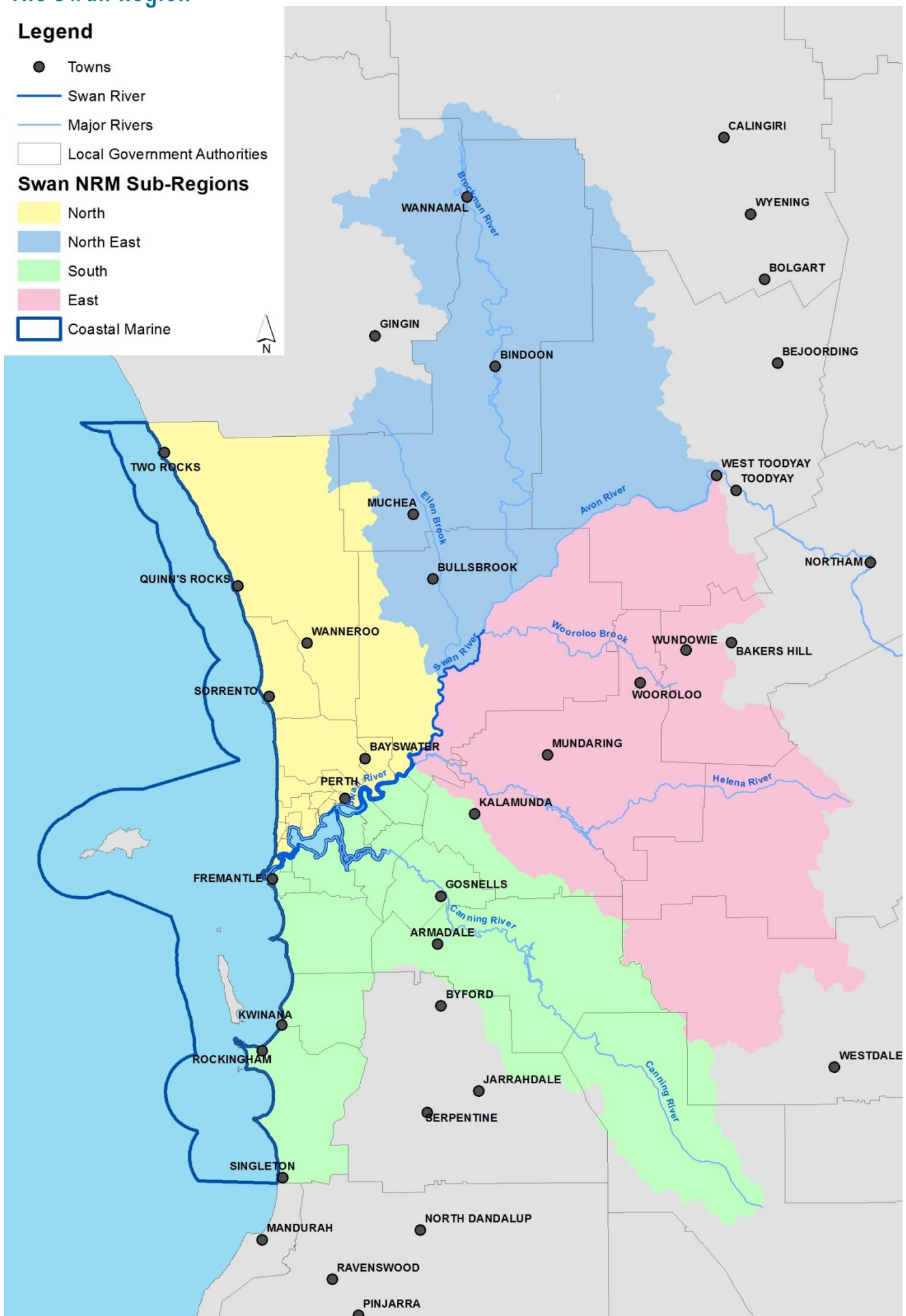
# The Swan Region

## Legend

- Towns
- Swan River
- Major Rivers
- Local Government Authorities

## Swan NRM Sub-Regions

- North
- North East
- South
- East
- Coastal Marine





## Regional Agreement and Coordinated Approaches

The Strategy identified regional coordination and agreement as an ongoing issue. Since the implementation of the Strategy there have been several strategic projects developed with coordination and agreement in mind. However, the implementation plan does not collate all these activities despite them targeting regionally significant issues. An enhanced strategic functionality of the Swan NRM Committee will intend to strengthen regional coordination.

### Swan NRM Committee

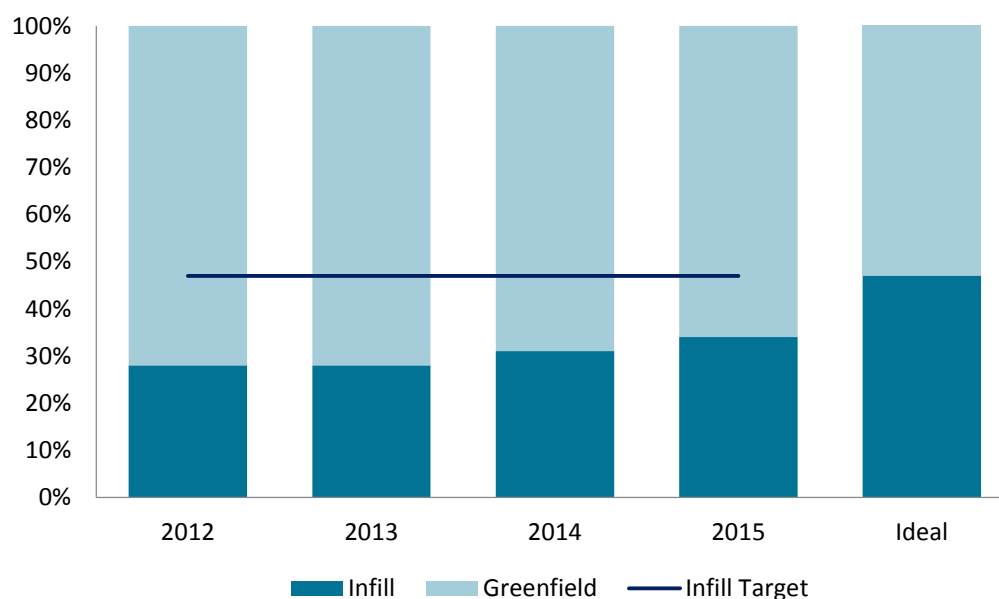
Stakeholders have continued to engage with the Strategy through the Swan NRM Committee. The Committee continues to host 25 organisational representatives from business, government, community and research sectors. The function of the committee is to align policies, programs, and actions towards agreed upon strategic outcomes for the Region. Its quarterly meetings have proven to invoke discussion and promote information sharing amongst Committee representatives. However, how far representatives disseminate information within their respective organisations is difficult to determine. Moving into 2018, the Committee will be meeting less often and have a more executive and strategic nature. Without losing the necessary discussion needed to make sound decisions, the Committee will receive support from thematic working groups, forums or similar idea generation events. The working groups will invite innovative thinkers and technical knowledge holders together to discuss critical natural resource management issues and emerging trends.

### Planning, Policies and Legislation

Perth continues to have one of the lowest housing densities in the world, with an average of ten dwellings per urban-zoned hectare. This is significantly lower than the target of 15 dwellings per hectare set in Perth's strategic growth plan, Directions 2031. The WA Planning Commission's 2016 Urban Growth Monitor 8 revealed the proportion of infill development has increased from 31% to 34% between 2014 and 2015. These continue to be considerably lower than the current policy of a 47% infill target set in Directions 2031. Nonetheless, this is an improvement from the lowest recorded infill rate of 28% in 2012 and 2013 (Figure 1).

If the city were to continue past consumption rates, we lose 30 years of opportunity for sustainable land use development. At these rates, it would take 31 years (as of 2015) to fully consume undeveloped land compared to 61 years if the policy target was met. The temporal land supply extends to 38 years under the UDIA scenario (35% infill/ 65% greenfield). Stakeholders across the region continue to identify sound planning decisions as an opportunity to improve environmental outcomes.

**Infill and Greenfield Consumption**





Above: A stretch of bushland in North-East sub catchment

### Biodiversity ACT 2016

The Biodiversity Conservation Act 2016 replaces the Wildlife Conservation Act 1950 and the Sandalwood Act 1929. This act contemporises the States legislation to conserve and protect biodiversity and its components. Additionally, the introduction of heightened penalties for illegal activities intends to ensure the ecologically sustainable use of biodiversity components in the State. The new legislation has increased penalties to act as a deterrent for serious wildlife crimes, ranging up to \$500,000 for an individual taking a critically endangered species, up from \$10,000 under the Wildlife Conservation Act. While this is an achievement, other acts remain more than 60 years old.

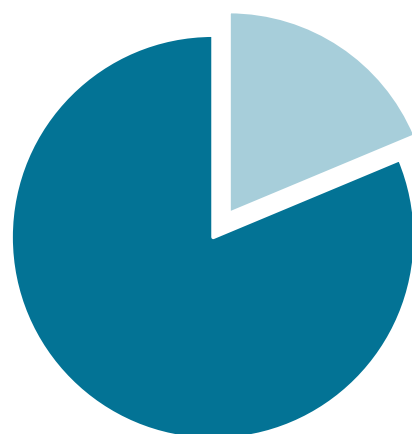
Western Australia continues to lack a unified single piece of legislation covering natural resource management. Government has the responsibility to ensure that legislation and policy remains contemporary, effective, and efficient and the best way of achieving the desired outcomes.

### Environmental Planning and Monitoring

The WA Local Government Association's Environmental Planning Tool provides a central platform for environmental planning matters. The tool continues to enable local government officers and other land managers to make decisions and provide advice. Decision support tools such as MCAS-S, INFFER, and Land Gate's Urban Monitor are also valuable tools for incorporating the latest information into decision-making processes.

Local Governments are readily accessing these tools and a variety of other information sources, such as independent experts and unpublished reports, to undertake strategic planning. This accessibility to tools is critical given 67% of Planners identify effective cross-boundary management as a priority, while climate change and integrated environmental management as ongoing strategic issues. Local biodiversity management continues to integrate with planning from a strategy level. Of eighteen councils surveyed in 2015, 81% are working towards biodiversity milestones and 75% have biodiversity strategies.

### Local Governments with Biodiversity Milestones



■ Without Milestones ■ With Milestones





Above: Volunteers implementing river foreshore restoration works

## Priorities for Action

1. **Promote the use of environmental accounting tools**
2. **Explore alternative funding models and approaches for increasing funding for natural resource management activities**
3. **Enhance the regional NRM model**

The Strategy and Implementation Plan provides a central reference point to coordinate investment and delivery into regional natural resource management. A focus of the Strategy and Implementation Plan was to explore alternative funding models and approaches for increasing funding for natural resource management activities. An option is to continue investigating and researching environmental accounting approaches to build the business case for investment in natural assets.

Financial security is an ongoing issue for community-based organisations due to their predominant reliance on short-term grants. This continues to create challenges for developing and managing long-term NRM programs and projects. Greater investment in natural resource management is still in demand to effectively protect and manage the complexities of regional NRM.

A more collaborative funding model can encourage and incentivise lasting, productive partnerships between community groups, local government, state agencies, researchers and industry. A recent success in these project types show promise. As a region, there is evidence for advocating towards greater investment in large-scale and long-term collaborative projects to break down traditional silos. Larger and long-term projects support a broader system thinking approach to natural resource management. By investing in partnerships and capacity as well as projects, there is clear recognition, effective environmental management requires more than discrete projects.

# Asset Protection and Sustainable Use

The Swan Region is wealthy in natural assets, each building our unique identity and sense of place. These assets support a mosaic of interdependent production, urban, lifestyle, and natural landscapes, providing us with the resources we need to live and prosper. Stakeholders in the Region continue to manage our assets for their intrinsic, societal, and economic value. Active management should continue to protect our high-risk or high-value assets. Private industry and businesses coupled with community groups, education, and government all have a mandate to ensure the sustainable use of our natural resources

## Environmental Management in Business and Local Government

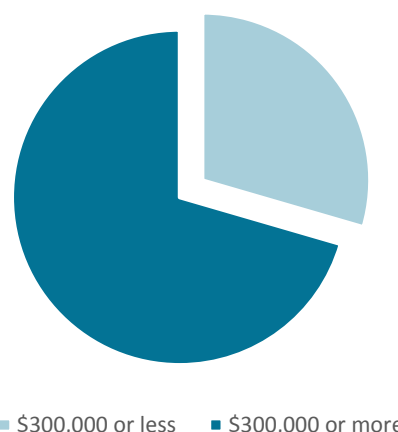
Financial barriers to environmental management adoption can hinder small operators and expose risks to fines and penalties due to environmentally harmful activities. Proactive environmental management can be the forefront for a business's 'environmental credibility' and a provision of social licence. The incentives for reportable environmental management are the financial benefits gained through reduced legal liability, greater market exposure, and operational efficiency. Business standards, policy guidelines, and codes of conducts can express community values and expectations.

### Local Government NRM Investment

The Swan Region covers 32 individual local governments including shires, towns, and cities. Amongst environmental professionals in local government surveyed, (85.5%) had a high awareness of the Swan Region Strategy for NRM.

Estimation for investment into natural resource management by local government is around \$14.8 million across the region. Most (70.5%) of local governments operate with budgets greater than \$300,000 for natural resource management.

### Local Government NRM Investment



### The Sediment Task Force

Human activity and extreme weather conditions have had a significant impact on water flows, nutrient balance and biodiversity within our wetlands. Earthworks, mobilisation of contaminants, and sedimentation are critical issues threatening wetlands and their functionality.

The Sediment Task Force (STF) represents a collaborative approach to managing the issue of sediment. Three local governments and representatives from industry bodies, catchment groups, and State Government are a part of the task force. The taskforce encourages the development of solutions to prevent sediment run-off. The development of guidelines coupled with industrial and community empowerment are achieving a greater understanding and effort to mitigate environmental risks to the regions wetlands.

The STF oversees research to evaluate and quantify sediment arising from urban development across Gosnells, Armadale and Kwinana. The University of Western Australia as part of the Australian Governments' Cooperative Research Centre for Water Sensitive Cities (Perth) undertake the research. The findings will inform decision making to manage sediment impact on water quality and drainage infrastructure, and help meet environmental standards on construction sites. Stakeholders have collectively contributed financial and in-kind support valued at \$95,000 towards this two-year project.





Above: An urban greenspace with native gardens and open recreation areas

### Urban Forests for the Future

Urban Forests are the collective greenspaces, trees, parks and private gardens within an urban environment. The intermingle of functional public and private greenspaces provide a variety of social, environmental and economic benefits to the community. Urban forestry is becoming popular for local governments in taking proactive and mitigated responses to climate change. The capacity for local governments to develop urban forest plans is growing.

In 2015, some 23 metropolitan local governments in addition to industry associations, state government departments and community groups attended the Urban Forest Master Class. The Master Class developed from a working partnership between Vision 202020, the Eastern Metropolitan Regional Council, Western Australian Local Government Association, and Department of Planning with the support of Parkland WA and AECOM. The purpose of this event is to advance urban green space at a local council level. Each local government area has its own unique challenges, varying political context, and are at different stages of the journey. Over half of 30 Perth metropolitan local governments (Oct. 2016) are working towards an Urban Forest Plan or similar.

### Light Industry Audit Program

A critical issue in the Swan Region is the contamination of water sources from light industrial and commercial activities from several sub-catchments. To address the ongoing issue, the Department of Environment Regulation (DER) and the Department of Parks and Wildlife (DPaW) collaborated with seven Local Governments to implement the Light Industry Audit Program. The program aimed to lower contamination entering groundwater and drainage systems in the priority Swan and Canning River catchments.

The program of audits, education and enforcement aimed to increase local government capability to regulate light industry under the Environmental Protection Act. The Local Governments and Departments jointly conducted 918 inspections of light industrial premises over the two-year period. Initial inspections showed compliance rates with SME's was as low as 26.6%. After two years of engagement, education, and reinspection, premises had improved their compliance rates to 87.5%. Similar initiatives could emulate the program and again target issues affecting the condition of natural assets.



Above: Wetland within the south sub-catchment

## Landscape Improvement through Local Action

The Swan Regions landscapes are interrelated, complex, and diverse systems. Our landscapes support our community's connection to the natural, urban, and lifestyle environment because of the cumulative function of our assets. This connection provides for our shared socio-economic wellbeing. Local networks are essential to community engagement, supporting and delivering landscape scale change at the local scale.

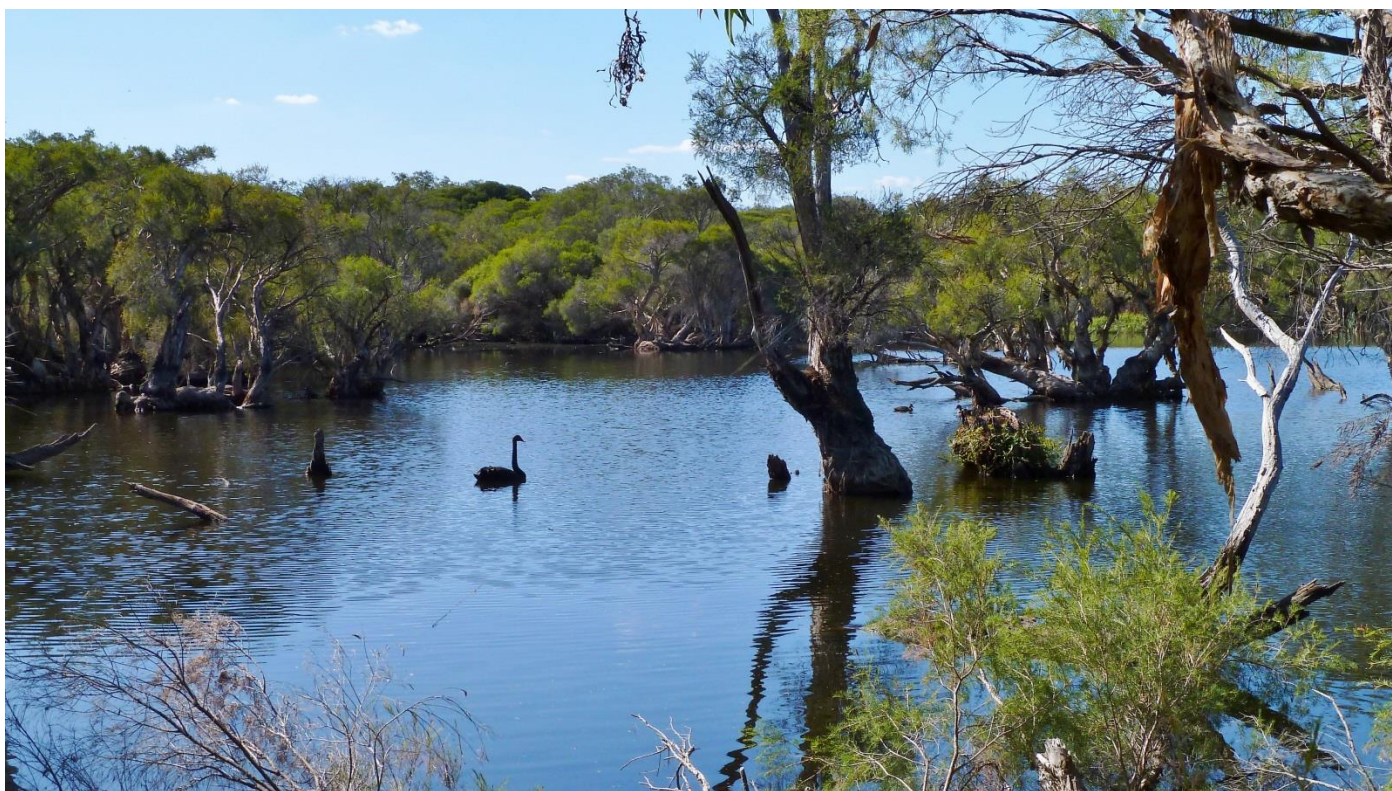
Local networks and trusting relationships are the foundation to building capacity in natural resource management and delivering sound environmental outcomes. The high level of autonomy held by community groups is positive. However, opportunities to pursue high priority projects could be lost due to a lack of inter-regional communication. Local government facilitators, community leaders, and strong local relationships throughout the region are essential to ensuring local and regional networks maintain strong communication channels. With open communication and strong relationships, we can deliver tangible positive results on asset protection, conservation, and long-term sustainability.

### Living Landscapes, Wetlands and Drains

The Living Landscape and Living Wetlands Programs focus on building resilience in the Swan Region and on community-led projects that protect and enhance biodiversity in priority landscapes, as identified through the Planning for Climate Change Project. In 2015, Perth NRM administered \$720,000 in grant funding from Australian Government's National Landcare Programme to seven community projects. The partnerships with SERCUL, Jane Brook Catchment Group, Armadale Gosnells Landcare Group, Friends of Paganoni Swamp and WWF aimed to enhance and restore critical habitat for 20 nationally threatened species across the region. The projects focused on protecting priority flora, fauna and wetlands.

The Drainage for Liveability Program is a collaborative effort between Water Corporation and Department of Water. The design of the program is to enhance the value of stormwater drains and basins for the community. Stormwater drains and basins serve a functional purpose, but they also have the potential to contribute to the liveability of our local communities. Drainage can enhance the urban environment through greenspace provision, cooling effects, enhanced biodiversity and greater environment and public interaction. Water Corporation and the Department aim to work with interested community groups, local authorities, and the development industry to improve drainage and surface water management and increase green open spaces in our urban environment.





Above: Beenyup Swamp in Joondalup – Credit Gary Tate

### Biosecurity in Action

Proactive biosecurity programs and projects can enable community action. This can be through community weeding days, management on agricultural land, or catchment scale-action. The Ellen Brockman Integrated Catchment Group obtained a State NRM Grant of \$46,000 to extend their feral control program in the Chittering Valley. The program aims to remove 300 pigs and over 500 foxes from the local environment. This builds upon past successful projects funded by the McCusker Charitable Foundation whereby 134 feral pigs were eliminated from the local area, in three months. Removing feral pigs is critical to preserve waterways, orchards and native vegetation within the Valley. The control of foxes will ease predator pressure on local flora, fauna, and livestock.

Larger scale control of biosecurity risks is essential to caring for our assets. Local vigilance to potential risks is paramount and forefront to mitigating landscape scale impacts. Successful programs from the Department of Primary Industries and Regional Development demonstrate this well. The implementation of the *Biosecurity Blitz* campaign demonstrates the changing model towards shared responsibility for biosecurity surveillance. In 2015, the Department received over 500 reports during the two-week campaign, with a majority coming from the metro-area. The program has continued for 2016 and 2017.

### Direct Community Action

The Swan-Canning River Recovery Program projects are a result of proactive local Friends of Groups, highlighting their concerns about the Canning River. In January 2015, Federal Environment Minister Hunt announced the Swan-Canning River Recovery (SCRR) Program, a \$1 million commitment to improve the health of the Swan and Canning Rivers with a further \$1 million in 2017.

The program has supported community groups working with SERCUL to restore and stabilise areas of the Canning River foreshore. Together with other stakeholders such as schools and local government, nearly 78 000 native seedlings have been planted over the life of the project. Additionally, significant gains in weed control are evident across the sub-catchment. While *hydrocotyle sp.* is a target species for the project, significant gains in controlling additional weeds are a great achievement. The Baigup Wetland Interest Group exemplifies this, with major elimination of invasive Bulrushes in and around the Secondary Lake in the Maylands Crown Reserve section of Baigup.





Above: Group of volunteers meet at a beach north of Perth

## Priorities for Action

1. **Develop a Swan Region Ecological Linkages Project**
2. **Advocate for a more coordinated approach to climate change adaptation in the Swan Region**
3. **Promote the use of environmental management systems across local government and businesses**
4. **Promote the application and adoption of incentives for land conservation**
5. **Promote voluntary standards and certification schemes that support environmentally responsible practices**

The Strategy advocates for the management of natural and cultural assets within a landscape system. Such an approach maximises synergies, addresses cumulative impacts and manages large-scale threats. A systems approach provides clearer understanding of the critical assets and ecological processes essential for the overall health and functioning of the Region's natural systems.

An adequate landscape approach is comprehensive, adequate and representative (CAR). To build landscape resilience and integrity a conservation reserve network needs high value ecological linkages. Initiatives such as the Local Biodiversity Program, Land for Wildlife and Bush Forever made significant headway in protecting key biodiversity assets in the landscape. While funding for the Local Biodiversity Program has ceased, several resources remain available (i.e. Environmental Planning Tool). *Land for Wildlife* is a voluntary scheme to encourage and assist private landholders to provide habitats for wildlife on their property. Currently there are 242 -registered Land for Wildlife sites across the Perth Region.

While achievements in asset condition occur readily across the region, there is a continued need to develop a more coordinated approach to climate change adaptation. This will draw on the best available knowledge and analytical tools, technical expert opinion, and academic input with the primary focus on building landscape resilience in the face of a changing climate. Within a landscape approach, the integration of cultural heritage values and practices with natural assets can enhance both contemporary and traditional approaches to natural resource management. This would ensure cultural heritage and ethnographic values are integral to a comprehensive and responsive landscape scale approach.



# Awareness, Participation and Capacity Building

The Strategy advocates for a more systematic approach to capacity building to ensure individuals and organisations have the knowledge, skills and resources to protect natural assets and adopt environmentally sustainable practices.

Opportunities to build capacity, support networks and knowledge sharing are essential to a thriving NRM and environmental sector. Investment in training and development and the promotion of best practice approaches has contributed to raising the standard of environmental management across the region. Capacity assessments for environmental groups and local government in the Swan Region remains vital to identifying capacity gaps. Understanding these gaps informs the tailoring of training programs and other support.

## Inclusion and Aboriginal Engagement

Prior to the release of the Strategy, the *Capacity Assessment of Environmental Community Groups in the Swan Region 2013* revealed that only 21% of respondents have connections with the Aboriginal community. Improvement in engagement and empowerment with the Aboriginal community continues as a gap in community capacity. In both the social capital and organisational capital sections of the assessment, volunteers identified the need for better connections to Aboriginal people and guidance on consultation. However, there are several programs addressing this across the region.

### Booyi Cultural Program

The Yelakitj Moort Noongar Association and SERCUL joined to present the Booyi Cultural Program. The interactive educational program celebrates the understanding and appreciation of Aboriginal and Torres Strait Islander histories and cultures. The Booyi program aims to engage people to see the land around them through the eyes of the Noongar people. The wider community are encouraged to value our rivers, wetlands and natural areas with heightened appreciation. Students participating in the Booyi Cultural Program discover the traditional practices of the Noongar people and their connection to the land within the Canning River and Yule Brook environment.

### Wirrapanda Foundation and Natural Resource Management

In 2014 - 2015, Noongar students from the Wirrapanda Foundation in Kwinana joined with the City of Kwinana and Perth NRM to progress towards Certificates 1 & 2 in Horticulture at Central TAFE. The students progressed their qualification through on-ground action within wetland and bushland environments, identifying and learning the management of invasive weeds.

The students spent time on-site identifying wetland and bushland weed species, assessing how they affect local biodiversity, agriculture, and native fauna as well as proper control and removal techniques. Another workshop taught students from the Wirrapanda Foundation and 'The New Opportunities for Women (NOW)' about recognising and managing *Phytophthora* Dieback. Working at Bibra Lake Reserve participants learnt to treat Jarrah, Casuarina and Banksia trees with phosphate injections.



Above: Students and volunteers with the Wirrapanda Foundation working to control Dieback



Above: School students administer treatment for Dieback

## Community Capacity and Capability

Community capacity is valuable when understanding collaborative relationships across the region. Annual community capacity assessments continue to identify critical gaps for local natural resource management groups. While 62% of volunteers surveyed reported working collaboratively with a management body such as local government, funding remains a priority to assisting in effective local relationships. Many respondents (42.5%) consider funding availability is the most effective way to improve the relationship between community groups and local government authorities to deliver joint outcomes.

Awareness with younger people remains critically low. This is resulting in an aging volunteer cohort. Since the assessments inception in 2013, most years result in no participants surveyed less than 39 years old. The 60 plus age bracket is an important volunteer cohort and made up over 50% of respondents in both the 2015 and 2016 survey.

### Community Capacity Assessments

The motivation for environmental volunteering is to primarily fulfil an individual need to protect and preserve the environment. Over two years (2015 to 2016), volunteers contributed 58,192 hours of groundwork worth \$1,756,440 of in-kind support.

Between 2015 and 2016, volunteer hours increased by 12%. In 2016, this enthusiasm and commitment fuelled 31,000 hours of on groundwork undertaken by surveyed volunteers within the Swan Region. Together their in-kind contribution to environmental activities was worth an estimated \$940,680. This is greater than measured in 2015 whereby volunteers contributed 27,192 hours on groundwork valued at \$815,760 (Figure 5.2)

### In-Kind Contribution

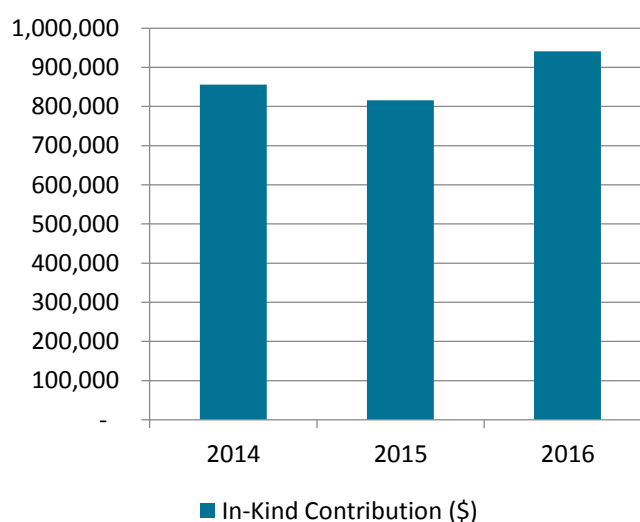


Figure 0-1: over the past two years (2015 to 2016), volunteers contributed 58,192 hours of groundwork worth \$1,756,440 of in-kind support. There has been a 12% increase of in-kind support valued at \$815, 760 and \$940,680 in respective years.





Above: The result of a planting event along a metropolitan beach

### State NRM Grants

The State NRM Program is a Western Australian Government initiative providing funds for activities to protect and enhance the State's environment and natural resources. Over 2015 and 2016, the State NRM Grants provided \$1.7 Million of funding to support NRM projects within the Swan Region (Figure 5.2).

In 2015, the State NRM Grants funded \$803,443 in Community Action Grants. In 2016, this amounted to \$741,055 in action grants in addition to Community Capability Grants. The purpose of the Community Capability Grants is to support volunteers to improve the governance and management performance of their community-based organisations. Ultimately, to enhance their capability to undertake on-ground work in the long-term. The Region received \$154,500 large and small-scale capability grants. The Community Capability Grants recognise the importance of having good organisational and institutional arrangements in place to support the efforts of volunteers and the not-for-profit organisations to which they belong.

### State NRM Grants

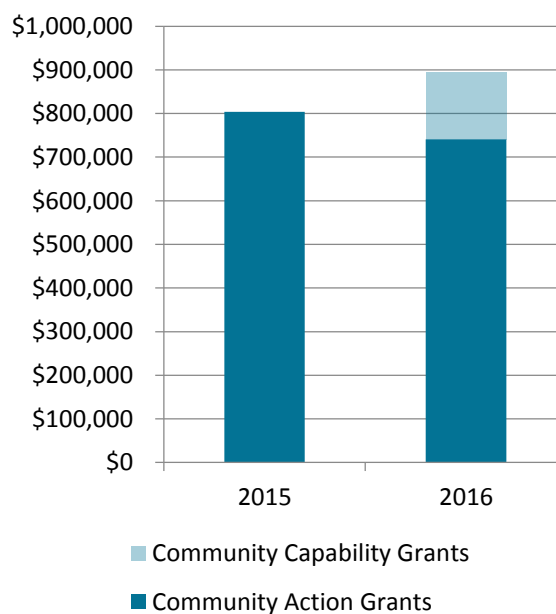


Figure 0-2: Over 2015 and 2016, the state nrm grants provided \$1.7 million of funding to support nrm projects within the swan region



Above: Water sensitive urban design

## Local Government and Climate Change Adaptation

Local government plays an important role in natural resource management due to their close connection to local communities and networks. Therefore, it is essential local government staff and elected members have the awareness, understanding and capacity to deliver effective natural resource management at the local level. Capacity building programs, such as the ceased Local Biodiversity Program, are vital for keeping local government abreast of knowledge and best practice in asset management and sustainability.

The Strategy and its concepts are appealing to local government staff, but perceived to be outside of their local control to execute or influence. There is an opportunity for the Strategy and its future Implementation Plan to encapsulate cross-boundary projects or programs. Similarly, communication and cross-organisational forums for local governments within the region to improve landscape-scale NRM would be valuable.

### WALGA Climate Change Programs

In 2015, 53.3% of local governments within the region considered climate change responses and adaptation as a critical capacity gap. One response to this critical need is WALGA's Climate Change Collaborators (C3) initiative. WALGA hosts quarterly meetings for Local Government officers to share work, hear presentations, and connect with new developments surrounding climate change. Currently, 12 local governments participate in the C3.

Additionally, some 40 Local Governments have signed WALGA's Climate Change Declaration. These local governments represent 65% of the State's population. Signatories of the Declaration further support WALGA to advocate for appropriate funding and development of legislative mechanisms to support Local Government climate change adaptation and long-term management.





Above: Kalamunda Farmers Market

## Priorities for Action

9. Support local government authorities to incorporate environmental matters and strategies into local planning schemes
10. Seek funding to continue the Local Biodiversity Program
11. Develop a public awareness campaign focussed on sustainability and reducing Perth's ecological footprint
12. Work with the Whadjuk Regional Body Corporate to increase Aboriginal participation in NRM

There is a wealth of environmental campaigns from local, national and international organisations inundating social media, professional, and community networks. Simple messages, sustained over time are evidently effective (Water Wise, Earth Hour, etc.) if they connect people with the bigger picture and are practically applied. The rise in popularity with 'Plastic Free July' by Western Metropolitan Regional Council and 'War on Waste' campaign on the ABC demonstrates this further.

One of the Strategy's strategic goals is to support the concept of integrating the natural environment with urban settlements to ensure people can connect with nature. The rise in liveability principles in urban planning, rejuvenation and design showcase this integration. Many projects across the region utilise a variety of approaches to create direct experiences for the community to engage with local natural and cultural heritage.

# Knowledge, Research and Adaptive Management

The Strategy emphasised the importance of timely access to information and analysis relating to natural assets when decision-making, program design and implementation happens. Knowledge management is the process of capturing, storing, and organising information, data and analyses. It ensures the collective intellectual capital of individuals, organisations and networks is available and accessible to decision makers, planners, legislators and investors.

## Citizen Science

There are many public, private and community-based organisations across the Region with a strong history of collecting data and generating knowledge in natural resource management. From universities through to citizen science programs, a range of different methods can gather valuable knowledge for environment and conservation projects.

### Citizen Science and Wildlife Monitoring

Citizen science is the collection and analysis of data by members of the public generally in collaboration with professional scientists. There are several programs and projects available for public participation. The Great Cocky Count (GCC) is an annual citizen science survey for two of the three threatened black-cockatoo species in the southwest and is popular amongst the community. Since 2010, more than 2,000 people have participated in at least one GCC as a registered volunteer. This makes the Great Cocky Count one of the largest citizen science surveys of its kind in Australia.

In 2016, over 700 registered volunteers surveyed 398 sites across the southwest of WA demonstrating significant community interest. However, with families and groups involved, the total volunteer participation likely exceeded 1,000 community members. The work undertaken by the wider public indicates a minimum population count for Carnaby's Black-Cockatoo in the Greater Perth-Peel Region was 11,418 (around twice the average for 2010-15).

While the Great Cocky Count is a large and widely popular survey, other species-specific surveys and population counts have happened across the region. The World Wide Fund for Nature in partnership with DPAW conducted Quenda (*Isoodon obesulus*) and Rakali (*Hydromys chrysogaster*) surveys across the Swan Region. Community groups hold similar surveys targeting iconic species such as Echidna (*Tachyglossus aculeatus*) within the Chittering Valley.



Above: A male Carnaby's Cockatoo





Above: City of Perth Skyline

## Research and Collaboration

### The Western Australian Biodiversity and Science Initiative

The Western Australian Biodiversity and Science Initiative (WABSI) is a joint venture between three major WA universities, CSIRO, Department of Parks and Wildlife, Environmental Protection Authority, Botanic Gardens and Parks Authority, WA Museum and the mining industry. They aim to foster active collaboration across sectors and between researchers to drive excellence in terrestrial biodiversity research, and to ensure that the information is accessible to stakeholders. They will also shape the strategic priorities for acquiring and managing terrestrial biodiversity knowledge through identifying research and knowledge gaps. There is an emphasis on addressing end-user knowledge needs as well as accommodating both the conservation of biodiversity and the development of the State. The focus for WABSI include:

- Developing an improved knowledge management system
- Completing a comprehensive biodiversity survey
- Establishing a further understanding of distribution patterns of plants and animal species to provide effective management
- Extending capabilities of restoration and ex-situ conservation across regions of the State

### CRC for Water Sensitive Cities and Water Sensitive Transition Network

The Water Sensitive Transition Network evolved out of a Cooperative Research Centre for Water Sensitive Cities (CRCWSC) project entitled *Mapping Water Sensitive City Scenarios*. The project led a series of participatory workshops in Perth in mid-late 2015 and developed the *Shaping Perth as a Water Sensitive City* report. The participants expressed a strong desire to ensure this work led to meaningful outcomes beyond the life of the CRCWSC research project. A collective commitment grew amongst participants to continue working together to progress the recommendations in the report and act as champions during Perth's transition. Participants are leaders and strategic thinkers of the urban water, planning and development sectors from across state government, local government, community and industry. Similar networks and the means to their inception could emulate this process.





Above: Hooker's Banksia – Credit Bryony Fremlin

## Adaptive Management

Adaptive management engages a scientific approach to management, and is therefore reliant on access to accurate and relevant information. Central to the adaptive management model is a robust and effective decision support system. For an organisation to foster an adaptive management structure the design of the support system needs to effectively capture, store, organise and interrogate information. Additionally, this information must be accessible to inform subsequent management and investment decisions.

### Banksia Restoration and Adaptive Management

The Banksia Woodland Restoration project is established through funds from the Jandakot Airport Holdings Pty Ltd (JAH). The funds are part of the Commonwealth's ministerial conditions to offset the impacts from allowing clearing of 167 hectares of native vegetation at Jandakot Airport. The offset provided the Department of Parks and Wildlife with funding of \$9,200,000 to conduct rehabilitation and conservation activities in banksia woodlands within 45 km of the airport.

The aim of the project was to create new and repair existing banksia woodlands, primarily as habitat for Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and the Grand Spider Orchid (*Caladenia huegelii*). The project also provided funding, seeds, seedlings and advice to community groups and local governments for banksia woodland restoration at 20 locations.

The success of adaptive management demonstrated by the project has shown restored areas supporting 160 native species in 2016 compared to 78 species in reference ecosystems. Another successful outcome was the establishment of 24,000-31,000 stems/ha of native perennial plants in 2015, well above the 7000 stems/ha target.

Community led restoration projects received \$303,000 of funding. Recipients harnessed an adaptive management approach utilising data from research projects conducted throughout the restoration effort. Additionally, community groups readily accessed data from NatureMap, Flickr and other online platforms to measure ecological outcomes through restoration trials. Using online resources facilitated valuable data collection. The availability and accessibility of this data was critical in observing establishment of species, setting seed collection targets to achieve effective composition outcomes. Similarly, this has given community groups and land managers improved understanding of fire recovery, biosecurity resilience, and species associations within banksia woodland ecosystems.





Above: Forrestdale Lake Nature Reserve – Credit Bryony Fremlin

## Priorities for Action

1. **Develop an approach to collating and communicating resource condition information for the region**
2. **Review and compile existing asset and risk information to support effective decision making**
3. **Develop regional research priorities that target critical NRM knowledge gaps**

Funding for natural resource management remains directed towards on-ground activities rather than monitoring the condition of assets. This means the collection of resource condition information is often opportunistic and at a small scale. However, larger scale monitoring such as the Water Corporation Drains for Liveability, the Banksia Woodland Project and the Great Cocky Count demonstrate the capacity to obtain a holistic view of resource condition over time and our ability to detect critical threats.

Access to resource condition information is vital for understanding what is or is not working and what the critical needs are in the Swan Region. The direction of increasing future funding could be towards systematic monitoring of resource condition to understand the status of natural resources and identify areas particularly under threat. Given the size of the task, it may be necessary to identify indicator species or surrogates to measure changes in natural systems over time. What remains critical is an ongoing commitment to understanding and responding to the condition of our natural assets.

Regional research plans or programs are present for water through the CRC for Water Sensitive Cities and biodiversity following the inception of WABSI. Though, there is little opportunity for the research collective to come together with a holistic natural resource management mandate for the region. Identifying and addressing natural resource management knowledge gaps, with research institutions specifically funded to address those gaps is an opportunity to pursue further. Innovative thinking and discussion will need to shift the paradigm from static asset management to a system thinking approach with NRM research. This will require interdisciplinary communication amongst the sciences directly linking research with policy makers, planners, business and industry. And with the excellent work being done with the CRC, WABSI and several other topic specific research groups, there is a wealth of approaches to consider.

# Conclusion

The Swan Region Strategy for Natural Resource Management commits to report on implementation annually. This first report celebrates some of the achievements seen across the Region. This not an exhaustive list, and represents a drop in the natural resource management pool. What the report does identify is the need for further refinement and direction to address the priorities of action outlined in the Implementation Plan. The report also identifies options to improve mechanisms and content reporting in the future.

## Recommendations

1. Develop a consistent reporting framework for the *Priorities for Action* across the natural resource management sector. This will include agreement on definitions, consensus on processes and timelines, and greater clarity on indicators of success for the *Priorities for Actions*.
2. Increase the focus on obtaining resource condition data across the spectrum of natural resources with the purpose of landscape-scale integration. The availability, accessibility and comprehensiveness of baseline and monitoring data continue to be issues for landscape-scale monitoring and remain asset focused.
3. Establish means of consistently monitoring community awareness on environmental issues. While capacity assessments provide valuable insight into the volunteer cohort in the region, awareness can measure the efforts undertaken outside of the conventional natural resource management space.
4. Improve reporting on work undertaken by and with the Aboriginal community to raise awareness of cultural values and Aboriginal engagement in natural resource management.



Above: Kayaker with dolphins off the coast of Perth



# Glossary

**Adaptive Management:** Passive adaptive management learns from the implementation of a historically informed 'best' practice, followed by review of the implementation. Active adaptive management involves a range of practices designed to achieve strategic goals and to test the truth of 'best' practice (e.g. feedback evaluation loops, iterative decision making, embracing uncertainty).

**Biodiversity** - the variety of all life forms including the different plants, animals and micro-organisms and the genes they contain, and the ecosystems of which they form a part.

**Biosecurity:** refers to a set of measures designed to protect the land from harmful pests, diseases, weeds and unwanted animals.

**Capacity Assessment** – an assessment (usually via questionnaire) of human, social, financial and organisational capital to determine an individual or group's capacity to undertake natural resource management.

**Cultural heritage** - in relation to a place, the relative value which that place has in term of its aesthetic, historic, scientific or social significance, for the present community and future generations.

**Ecological footprint** - the ecological impact of cities, including the direct local effects and the indirect regional and global effects due to the resources they use and the wastes they produce.

**Ecosystem services** - the benefits provided to humans through the transformation of resources (or environmental assets, including land, water, vegetation and atmosphere) into a flow of essential goods and services e.g. clean air, water, and food.

**Evaluation** – the systematic review of a program, project, strategy or other activity to determine its effectiveness, efficiency, appropriateness and impact. Evaluation involves collecting and analysing information to make judgements and recommendations for future action.

**Landscape** - all the natural features of land or territory encompassed in a single view (e.g. fields, hills, forests and water), which distinguish one part of the Earth's surface from another.

**Monitoring** – the regular gathering of information in a consistent manner to track progress or changes over time.

**Natural resource management** – the management of any activity that uses, develops or conserves natural resources, the land, water, air, natural diversity (physical and biological) and the systems they form.

**Sector** - a specific section of the community, such as state government, local government, industry, public land managers, the 'care' community, the Aboriginal community.

**Sedimentation** - material of varying size, both mineral and organic, deposited away from its site of origin by the action of water, wind gravity or ice.

**Stakeholders** – agencies, organisations and individuals responsible for managing the Region's natural resources.

**Threatened species or ecological communities** – species or communities listed under state or Commonwealth legislation that need to be specially protected because they are under identifiable threat of extinction, are rare, or otherwise in need of special protection.

**Water resources** - includes all wetlands, waterways and groundwater resources in the Region. Includes reference to water supply, habitat and biophysical processes, and includes the biotic and abiotic elements of waterways, wetlands and groundwater.

**Wetland** - areas that are permanently, seasonally or intermittently waterlogged or flooded.

