



PROGRAM

14th Annual WA Wetland Management Conference 2018

Celebrating World Wetlands Day
Friday 2nd February 2018
9am to 4pm



Lake Monger, Wembley, Western Australia

**Cockburn Wetlands Education Centre,
184 Hope Road,
Bibra Lake, Western Australia**

Conference Program

(*Denotes speaker, where there are multiple authors)

8.00 am Registrations (come early for a cuppa and catchup with other wetlanders)

Opening

- 9.00 am Opening remarks
Emeritus Professor Philip Jennings, Wetlands Conservation Society Inc
- 9.05 am Welcome to country
Reverend Sealin Garlett

SESSION 1 (Chairperson: Dr Michael Coote, Department of Biodiversity, Conservation and Attractions)

Keynote presentation

- 9.10 am Policy failure or success in managing wetlands under climate change?
Professor Max Finlayson, Institute for Land, Water & Society, Charles Sturt University

Due to unforeseen circumstances Professor Finlayson is unable to attend but will be providing a pre-recorded presentation and will take live questions.

Plenary presentations

- 9.40 am Restoring the balance: Gngangara groundwater
Michael Hammond, Department of Water and Environmental Regulation
- 10.00 am Peel-Yalgorup System's Wetlands and People Plan –An Australian first in Wetland Action Planning
*Kim Wilson¹, Sharon Meredith¹, Andrew Del Marco² and Amanda Willmott²
¹Peel-Harvey Catchment Council
²Ironbark Environmental (Consultancy)
- 10.20 am Biodiversity and water quality improvements at Mabel Talbot wetland
Giles Pickard, City of Subiaco

10.40 am Morning tea

SESSION 2 (Chairperson: Melanie Davies, WA Local Government Association)

- 11.20 am Sharing cultural and ecological knowledge to protect and manage freshwater ecosystems
*Neil Pettit¹, Rebecca Dobbs¹, Christy Davies², Brad Pusey¹ and Michelle Walker¹
¹Centre of Excellence in Natural Resource Management, The University of Western Australia, Albany, WA
²North Australian Indigenous Land and Sea Management Alliance, Darwin
- 11.40 am Options for the potential replenishment of Ramsar listed Forrestdale Lake, Armadale
*Helen Brookes and *Shelley Shepherd, Urbaqua Ltd
- 12.00 pm Unplanned learning: Benefits of interaction with an urban wetland centre
*Dr Felicity Bairstow¹ and *Dr Catherine Baudains²
¹Cockburn Wetlands Centre
²Murdoch University

Poster presentations

- 12.20 pm Bittern in urban wetlands
Robyn Pickering, BirdLife Western Australia
- 12.25 pm Characterising the condition and function of the Greater Brixton Street Wetlands, Kenwick Western Australia, to inform conservation management
*Lindsay Bourke¹, Kate Brown², Grazyna Paczkowska², Adrian Pinder¹, and David Cale¹
¹Wetlands Conservation Program, Department of Biodiversity, Conservation and Attractions, Kensington, WA.
²Parks and Wildlife Service Swan Region, Department of Biodiversity, Conservation and Attractions, Crawley, WA

- 12.30 pm Temporal shifts in dominant sources of dissolved nitrogen in the modified Vasse Wonnerup Wetland System, Australia
*Roisin McCallum¹, Professor Glenn Hyndes¹, Dr Kathryn McMahon¹, Dr Jane Chambers², Professor Bradley Eyre³, Dr Joanne Oakes³, Dr Naomi Wells³
¹ Centre for Marine Ecosystem Research (CMER), School of Science, Edith Cowan University, Joondalup Campus, Perth, WA
² Environmental and Conservation Science, VLS, Murdoch University, Perth, WA
³ Centre for Coastal Biogeochemistry, Southern Cross University, Lismore, NSW
- 12.35 pm Wetland biodiversity patterning along the middle to upper Fortescue valley (Pilbara: Western Australia) to inform conservation planning
*Michael Lyons¹, Adrian Pinder¹, Margaret Collins¹, Loretta Lewis¹, Kirsty Quinlan¹, Russell Shiel², Rebecca Coppen¹ and Faye Thompson¹
¹ Wetlands Conservation Program, Department of Biodiversity, Conservation and Attractions
² Ecology and Environmental Science, University of Adelaide

12.40 pm Lunch

Session 3 (Facilitator: Linda Metz, City of Cockburn)

Panel discussion

- 1.30 pm A facilitated discussion with a focus on wetlands and climate change issues requiring attention both politically and from a management perspective.

Confirmed panel members

Dr Jane Chambers, Wetland Ecologist, Murdoch University

Suzanne Brown, Manager Drainage and Liveable Communities, Water Corporation

James Duggie, Principal Policy Officer, Climate Change, Department of Water and Environmental Regulation

2.30 pm Afternoon tea

Session 4

Workshop concurrent session

- 2.50 pm Workshop Session

WORKSHOP CHOICES (choice of 1 workshop)

Delegates can attend one workshop during the concurrent session. Please select two preferences from the following five workshops and number from 1 to 2 on the registration form (1 equals your highest preference). Workshops will be filled on a first-come basis following registration.

Workshop 1: Typha management in a changing climate

Presenters: Adam Harris, Environmental Officer, City of Cockburn and Greg Keighery, Department of Biodiversity, Conservation and Attractions

Typha orientalis is a common coloniser in wetlands and has in some cases become weedy in nature as it displaces other native vegetation. Join Adam Harris from the City of Cockburn with special guest Greg Keighery from Department Biodiversity, Conservation and Attractions to learn more about this species including its recent reclassification in status, biology and management actions including control.

Workshop 2: Mapping tools to identify priority restoration projects to improve habitat connectivity

Presenter: Renata Zelinova, Business Development Officer (Environmental Planning Tool), Western Australian Local Government Association

Following a short demonstration of data available to assess vegetation connectivity in the SW of Western Australia, workshop participants will be exploring the capabilities of the publicly available on-line Environmental Planning Tool in assisting with prioritising and designing restoration projects. The focus of the workshop will be on identifying gaps in habitat connectivity.

The public version of WALGA's Environmental Planning Tool (EPT) is designed to assist community groups undertaking natural area restoration to assist with planning, mapping and monitoring their works in a format that can be easily exchanged with land managers, such as Local Government of the Department of Biodiversity, Conservation and Attractions.

The EPT can be used to assist with the identification of ecological linkages at regional and local levels, to assess indicative environmental values and can be used to record and monitor vegetation condition, management actions and plan restoration projects. Access is provided to information on vegetation types by current and pre-clearing vegetation extent as well as to Reference Sites which summarise information on typical plant communities for the Swan Coastal Plain and Jarrah Forest in the Perth metropolitan area.

The EPT can be used to various types of files, including GIS software compatible shape files, which can be exchanged with others. The reporting function provides immediate access to information on area, vegetation type, vegetation conservation significance, proximity to wetlands and their buffers, proximity to protected areas or ecological corridors and other information relevant to natural resource management. The users can identify whether the Local Government where they are working adopted a Local Biodiversity Strategy.

Further benefits of using the EPT include the ability to load and display information collected in the field using a GPS or other methods with other relevant information not only an aerial photography; and an ability to undertake basic mapping without the need to purchase or access other GIS software and collect datasets.

A booklet of one page instructions to undertake specific EPT analysis will be provided to workshop participants, including instructions on how to access the EPT. The booklet will be used by the workshop participants to test how to use the EPT effectively and provide an easy guide for using the EPT after the workshop.

Workshop participants are welcome to use their own laptops with Wi-Fi internet access to follow the demonstrations.

Workshop 3: Bird surveying in the technological age: Using Birdata for wetland bird surveys

Presenter: Tegan Douglas, WA Citizen Science Project Coordinator, BirdLife Western Australia

Birds are visible indicators of wetland health, and can demonstrate the success and progress of restoration and ongoing management activities. BirdLife Australia has a long history of monitoring wetland birds, including resident waterbirds, migratory shorebirds and bush birds. The ongoing contribution of citizen scientists is instrumental in this work, with the compiled wealth of knowledge feeding directly into on-ground actions and guiding management decisions. In recent years BirdLife has shifted to a user-friendly app and web portal called Birdata to allow this work to continue. In this workshop we will explore how easy it is to use these BirdLife tools to monitor wetlands regardless of whether you are a recreational citizen scientist, a member of a friends group, or a land manager. We will incorporate a practical demonstration of how Birdata can work for you, both to submit surveys and to use the existing data to answer questions about our wetlands and their birds.

Workshop 4: RIPPLE EFFECTS: How to grow community participation in wetland-friendly living

Presenter: Anne Pettit, Pettit Projects

The notion of 'wetlands' and their benefits for urban communities can be vague or not even on the radar for people, even though a lot of everyday habits are affecting wetlands in positive or negative ways. This workshop will explore these things, and provide a guide to using our interests and expertise to bring communities on board with wetlands appreciation and care.

Workshop 5: From wetland weeds to a wetland SPA (site visit)!

Presenter: Denise Crosbie, Wetlands Officer, Cockburn Wetlands Education Centre Inc

The wetland vegetation community at Bibra Lake has suffered from past land clearing practices and subsequent invasion by weeds. Since 2003 the Cockburn Wetlands Education Centre, with support from the City of Cockburn, has undertaken a variety of trials to develop practical techniques for re-establishing the wetland vegetation communities. The project aimed to create reasonably self-sustaining vegetation communities that would also function as a wetland seed production area (wet SPA) to supply locally provenanced seed for annual revegetation projects.

The site visit will pass through an annual sequence of works dating back to 2003 and examine the practical techniques used including seed collection and propagation, initial site preparation, revegetation and maintenance.

Photomonitoring records will demonstrate the changes over time. A highlight of the visit will be the *Narma Kullarck* floating boardwalk. Please wear enclosed shoes, a hat and bring a water bottle. *(Please note: some delegates may have participated in this site visit at previous conferences. The visit is primarily aimed at new attendees).*

4.00 pm Post-conference drinks and nibbles

This Program may be subject to some changes prior to or during the conference.

Please help the environment – bring your own water bottle!

WHAT IS WORLD WETLANDS DAY?

2 February each year is World Wetlands Day. It marks the date of the signing of the Ramsar Convention on Wetlands on 2 February 1971, in the Iranian city of Ramsar on the shores of the Caspian Sea. The Convention on Wetlands is the only global intergovernmental treaty that deals with a particular ecosystem. It provides the framework for national action and international cooperation to halt the worldwide loss of wetlands and to conserve, through wise use and management, those that remain. Presently there are 169 Contracting Parties, up from 21 initial signatory nations in 1971. The Ramsar list of Wetlands of International Importance now includes over 2,200 sites covering more than 2.1 million square kilometres.

World Wetlands Day was celebrated for the first time in 1997 and made an encouraging beginning. Each year, government agencies, non-governmental organizations, and groups of citizens at all levels of the community have taken advantage of the opportunity to undertake actions aimed at raising public awareness of wetland values and benefits in general and the Ramsar Convention in particular.

WORLD WETLANDS DAY 2018

The international theme for World Wetlands Day 2018 follows the Ramsar theme of 'Wetlands for a Sustainable Urban Future. Urban wetlands make cities liveable in many important ways. They reduce flooding, replenish drinking water, filter waste, provide urban green spaces, and are a source of livelihoods. These wetland benefits grow ever more crucial as the number of people living in cities has now passed the 4 billion mark and continues to rise. By 2050, 66% of humanity will live in cities, as people move into urban areas searching for better jobs. Unfortunately, most people are unaware of the value and importance of urban wetlands. In fast-growing cities, wetlands are often viewed as wasteland; places to dump rubbish, fill in or convert to other uses. Scientists estimate that at least 64% of the world's wetlands have disappeared since 1900, while in parallel, cities have exploded in growth.

World Wetlands Day 2018 aims to raise awareness about how urban wetlands contribute to the future of sustainable cities (www.worldwetlandsday.org).

KEY MESSAGES

- Urban wetlands make cities liveable by providing multiple benefits such as; flood control, water supply, waste treatment, green space and livelihoods.
- Urban wetlands should be integrated into a city's sustainable future planning and development; not viewed as wasteland.
- Cities should adopt policies and actions which help conserve and promote urban wetlands.

For further information and activities visit www.worldwetlandsday.org

SPONSORS

The primary objective of the Conference is to provide an annual opportunity for the exchange of information and ideas between wetland practitioners with a focus on the latest developments about how to effectively manage and restore wetlands. The Conference is intended to bring together community conservation volunteers, landowners, local and State Government officers and private sector environmental officers involved with wetland management. The Cockburn Wetlands Education Centre gratefully acknowledges the generous support of the following sponsors and supporters that allow us to keep the registration fees at a minimum.

SILVER SPONSORS

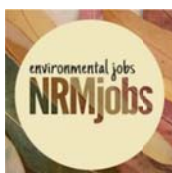


Department of **Biodiversity,
Conservation and Attractions**



Government of **Western Australia**
Department of **Water and Environmental Regulation**

SUPPORTERS



OPENING

9.00 am

Opening remarks

Emeritus Professor Philip Jennings,
President, Wetlands Conservation Society Inc

9.05 am

Welcome to country

Reverend Sealin Garlett

Reverend Sealin Garlett, is a Noongar man from the South-West of Western Australia. He was born in the wheat belt town of Bruce Rock, 270km to the east of Perth.

Reverend Garlett is an ordained minister of the Uniting Church in Australia and his parish is in Coobellup.

Sealin's ministry has always included his passion for reconciliation. He has worked tirelessly to promote the journey of our individual cultures.

He has recently retired from his position as the Chairperson for Uniting Aboriginal & Islander Christian Congress in Western Australia.

SESSION 1

**(Chairperson: Dr Michael Coote, Department of Biodiversity,
Conservation and Attractions)**

KEYNOTE PRESENTATION

9.10 am

Ramsar speaker

Policy failure or success in managing wetlands under climate change?

Professor Max Finlayson
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Policy failure or success in managing wetlands under climate change? Experience from wetland researchers and managers in Australia and New Zealand has been used to examine the implications of climate change for wetland policy and management, and to identify potential adaptation measures and the information needed to support these. This included an appraisal of how vulnerable wetlands were to climate change, focusing on exposure and sensitivity – many wetlands are highly vulnerable, especially in the light of past management decisions that have likely weakened the resilience of many. With this in mind the existing policy context and guidance available for dealing with changes in wetlands due to climate change was considered. Unfortunately guidance at an international level is limited - the Ramsar Convention on Wetlands has hitherto not addressed these issues in sufficient depth. The reasons for the latter are many and

include denial, limited awareness and understanding, and being mixed in political agenda, rather than addressing the realities of the evidence and state of wetlands. Undoubtedly these issues translate directly to local levels. This led to the development of a set of principles to guide adaptation of wetland conservation and management policy to climate change, covering: i) the setting of objectives and targets to accommodate and compensate for climate change, rather than accepting or avoiding impacts; ii) the inclusion of ecological, social and economic targets across multiple scales when setting objectives; iii) the adoption of flexible, governance and adaptive co-management frameworks across multiple scales and sectors; iv) the implementation of easily reversed, no-regret or low-regret adaptation options with multiple, cross-sectoral benefits in the initial phases of adapting wetland management; and v) the inclusion of triggers for new actions, including novel or high-risk adaptation options and planning for such eventualities. These guidelines are largely repeating established wisdom, and are not radical departures from established knowledge and understanding of what is needed for effective wetland management. Hence to manage wetlands effectively under climate change we can start by looking at our existing successes and failures in policy and actions, and turn up the heat a little.

PLENARY PRESENTATIONS

9.40 am

Restoring the balance: Gnangara groundwater

Michael Hammond

Department of Water and Environmental Regulation

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Perth is relatively unique from a water management perspective because of the amazing groundwater resources that underlie our city. Groundwater is particularly valuable to Perth – both when left in, and when taken out of the ground. In the ground, it supports nearly all of the natural lake and wetland environments around Perth. These groundwater dependent environments are not only some of the most biologically diverse, ecologically important and culturally significant areas on the Swan Coastal Plain but also make our city a cooler and more attractive place to live. Groundwater use is also really important to Perth – it currently makes up about half of the water supplied to our homes through the Integrated Water Supply Scheme. Groundwater is also used by local governments and schools for the irrigation of parks, gardens and sporting ovals (all the green public open spaces that make living in Perth great) and by horticulturalists to grow produce that ends up in our local greengrocers. Managing the Gnangara groundwater system, the larger of the two systems that underlie Perth, is all about trying to achieve a balance between these competing benefits – protecting our lakes and wetlands while optimising use of groundwater. The Gnangara groundwater system has shifted out of balance. Lower rainfall since the 1970s combined with only slightly lower groundwater use has resulted in declining groundwater levels and drying of some wetlands. With Perth's climate continuing to dry, we need to take another step to reduce groundwater

use and restore balance to the Gnangara system, to protect our lakes and wetlands and to maintain groundwater as a viable resource. This will help create a liveable, sustainable, productive and resilient Perth for the long term. All water users have a part to play in adapting groundwater use to the drying climate. We can all contribute by rethinking how we use, manage and interact with water in our homes and businesses.

10.00 am

**Peel-Yalgorup System's Wetlands and People Plan
–An Australian first in Wetland Action Planning**

*Kim Wilson¹, Sharon Meredith¹, Andrew Del Marco² and Amanda Willmott²

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²Ironbark Environmental (Consultancy) – Plan authors

Australia's 1st (World's 2nd?) Site Specific CEPA Action Plan with a focus on influencing decision makers – launched 1st November 2017, "a watershed moment".

The 26,530ha Peel-Yalgorup System, Ramsar Site 482, has been described by the Peel Development Commission as "our most important and strategic natural asset".

The wetlands are part of the SW Biodiversity Hotspot and suffer similarly with respects to pressures on, and threats to, the Systems i.e. the international significance of the wetlands versus their current "plight".

The Plan has been developed in accordance with Ramsar Convention's CEPA Programme – on communication, capacity building, education, participation and awareness (CEPA; Peel-Yalgorup System's Ramsar Site Management Plan; Ramsar Policy Brief No. 2 "Integrating multiple wetland values into decision-making").

Development of the Plan - Expert Panel Approach:

The Plan was developed around a project methodology based on a *literature & target audience analysis*; the engagement of an *Expert Panel* providing specialist input from a range of and extensive stakeholder engagement for this vast and complex system.

The Plan's Launch

November 1st chosen strategically for launch – opening of crab season (the crabs are part of the Ramsar listing) – wise use recognises the need for two month closure to protect breeding stock.

The Plan's target audiences:

- people who use the wetlands,
- those with businesses which benefit from the wetlands, and
- those who make decisions which affect the wetlands.

Goals

The Plan has four Goals to be implemented collaboratively through 9 Objectives and 32 Actions, to create a brighter long-term future for the wetlands.

- encourage wise-use-
- achieve better-informed decision making
- Increase active stewardship and advocacy across all sectors
- Raise awareness and action through social marketing

Examples of Actions already underway will also be outlined.

10.20 am

Biodiversity and water quality improvements at Mabel Talbot wetland

Giles Pickard

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Biodiversity and water quality improvements at Mabel Talbot wetland, Jolimont. The talk will cover the changes in community attitudes and the management of a water-supplemented 'European style' wetland, to a natural wetland that supports many ecological and community values in an urban environment. The presentation will touch on the issues within the large catchment of the wetland and how the city is addressing these issues to improve the water quality and the surrounding environment of the reserve.

10.40 am to 11.20 am

MORNING TEA

SESSION 2

(Chairperson: Melanie Davies, Western Australian Local Government Association)

PLENARY PRESENTATIONS cont'd

11.20 am

Sharing cultural and ecological knowledge to protect and manage freshwater ecosystems?

*Neil Pettit¹, Rebecca Dobbs¹, Christy Davies², Brad Pusey¹ and Michelle Walker¹

¹Centre of Excellence in Natural Resource Management

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²North Australian Indigenous Land and Sea Management Alliance, Darwin

Aquatic ecosystems have high conservation significance as hotspots for maintaining local and regional biodiversity. These wetlands are also important for the vitality of local communities and economies. To support both cultural and ecological water values,

partnerships between Indigenous and non-Indigenous stakeholders are critical. We present a case study from the Kimberley region of Western Australia that highlights how a collaborative research program, incorporating Indigenous and Western Scientific knowledge of remote wetlands and using a variety of field-based activities and workshops, can identify threats, processes, aspirations and management priorities for wetlands. One outcome of this process was the investigation of the influence of groundwater on the ecology of these wetlands. In regions where groundwater is influential in maintaining aquatic habitats, future development of groundwater reserves will likely affect the ecological and cultural value of freshwater wetlands.

11.40 am

Options for the potential replenishment of Ramsar listed Forrestdale Lake, Armadale

*Helen Brookes and *Shelley Shepherd
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The potential replenishment of Ramsar listed Forrestdale and Thomsons lakes is highlighted in the Strategic Environmental Assessment for the Perth and Peel Region (2015). Part D: MNES Assessment – Chapter 19 includes a State Government commitment to “Conduct an investigation into a potential stormwater supplementation program for Forrestdale Lake to identify limits of acceptable change, incorporate findings into adaptive management arrangements and future planning.” A number of recent studies have identified that Forrestdale Lake is experiencing a significant decline in both the minimum and maximum water levels as well as lengthening dry periods. A decline in waterbird activity has also been observed which is likely to be reflective of the declining water levels. This paper presents the findings of a project aimed at delivery of the State Government’s commitment by scoping options for supplementation of Forrestdale Lake and makes recommendations for further feasibility analysis and subsequent implementation.

12 noon

Unplanned learning: Benefits of interaction with an urban wetland centre

*Dr Felicity Bairstow¹ and *Dr Catherine Baudains²

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This presentation will argue that interaction and association with wetland spaces provide significant education, health and social benefits to urban communities. The social and

health benefits associated with education in 'natural' areas are well documented in the literature. Various research has demonstrated positive cognitive and affective impacts of both formal and informal education opportunities associated with wetland areas. Public use of urban wetland reserves remains high across metropolitan areas, suggesting people in urban areas are attracted to wetland environments. There is evidence that interaction with the Cockburn Wetlands centre provides the opportunity to engage people in broader conservation education which they may not otherwise choose to directly pursue. Common questions asked about the animals (eg turtles) or plants (weeds & algae) arise due to concern that the wetlands are drying out and 'dying'. The service of answering these questions prompts informal learning and can achieve significant change in behaviour and understanding relating to a range of broader environmental and conservation issues. Therefore, wetlands provide a crucial pathway for environmental education while concurrently increasing community connection with nature and all of its associated benefits.

POSTER PRESENTATIONS

12.20 pm

Bittern in Urban Wetlands

Robyn Pickering

BirdLife Western Australia

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W <http://www.birdlife.org.au/projects/bittern-project>

The Australasian Bittern is an endangered waterbird. It is estimated that the species has a global population of less than 2500 and that less than 150 remain in Western Australia. It was estimated in 2009 that the population in Western Australia had declined by 25% to 50% since the early 1980s. BirdLife Western Australia have been working with the Department of Biodiversity, Conservation and Attractions since 2007 to conserve this species. Australasian Bittern are very rare in Perth's urban wetlands.

The Australian Little Bittern is an extremely cryptic waterbird whose population has not been assessed but has a status of Least Concern. BirdLife are compiling records of Australian Little Bittern and the Australasian Bittern surveys assist with this. Australian Little Bittern are an uncommon resident in Perth

Healthy wetlands are the key to conserving these species. Both species need wetlands with inundated sedges or rushes for nesting and a healthy fauna biodiversity for feeding. Climate Change has been assessed as the biggest threat to the Australasian Bittern.

12.25 pm

**Characterising the condition and function of the Greater Brixton Street Wetlands,
Kenwick Western Australia, to inform conservation management**

*Lindsay Bourke¹, Kate Brown², Grazyna Paczkowska², Adrian Pinder¹, and David Cale¹

¹Wetlands Conservation Program,

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² Parks and Wildlife Service Swan Region,

Department of Biodiversity, Conservation and Attractions, Crawley, WA

The Greater Brixton Street Wetlands (GBSW) comprises a complex series of seasonally inundated or seasonally waterlogged areas classified as basins, palusplains, floodplains, sumplands and channels. The GBSW is spatially defined by the cadastral boundary of Bush Forever site BF387 and is situated at the foot slopes of the Darling Scarp within the geomorphological unit known as the Pinjarra Plain. This area has been identified as one of the most important conservation areas on the Swan Coastal Plain, containing more than 550 native plant taxa, Declared Rare Flora, Priority Flora and Threatened Ecological Communities.

Weed incursion, inappropriate fire regimes, altered hydrological processes, inappropriate access, and climate change have been identified as key threats to the long-term ecological function of the biological values associated with the GBSW. The Department of Biodiversity, Conservation and Attractions aims to apply best practice principles, founded on robust science, for the management of key threatening processes that affect nationally listed ecological communities occurring across the GBSW.

The Department has commenced a series of surveys and investigations to characterise the condition and function of the GBSW. These include:

- Hydrological investigations to conceptualise the hydrological functioning of the GBSW to inform the assessment of threats from altered hydrology that in-turn informs management activities, such as the prioritisation of track closures and rehabilitation;
- Engaging the Friends of Brixton Street Wetlands to undertake water level monitoring to characterise wetland hydroperiod;
- Aquatic invertebrate surveys as part of a broader characterisation of aquatic fauna diversity in vegetated claypans (vernal pools) of the higher rainfall areas of the south-west;
- Weed mapping to inform strategic weed management;
- Vegetation condition surveys to establish baseline conditions to assess long-term trends; and
- Trials to determine appropriate techniques for weed management across populations of threatened flora.

Outcomes from the completed surveys and investigations have already resulted in the implementation of on-ground actions, including rehabilitation of tracks and track

closures, targeted weed management, and construction of specialised fencing. Ongoing work will continue to inform conservation management activities at the GBWS to ensure they meet the projects goals as well as recovery actions detailed in the relevant Interim Recovery Plans.

12.30 pm

**Temporal shifts in dominant sources of dissolved nitrogen
in the modified Vasse Wonnerup Wetland System, Australia**

*Roisin McCallum¹, Professor Glenn Hyndes¹, Dr Kathryn McMahon¹, Dr Jane Chambers²,
Professor Bradley Eyre³, Dr Joanne Oakes³, Dr Naomi Wells³

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³ Centre for Coastal Biogeochemistry, Southern Cross University, Lismore, NSW

Affiliations: South West Catchment Council, Department of Water and Environmental Regulation

With over 60% of the world's population living within 100 km of the coast, the value placed on estuaries is extremely high. This proximity triggers a range of anthropogenic pressures on estuarine systems from high urban and agricultural inputs (e.g. wastewater and fertiliser) to alterations in their hydrodynamics. The input of organic matter (OM) and nutrients from the catchment and the microbial decomposition of OM in estuaries consumes oxygen and releases nutrients which drives the high primary productivity of estuaries, and lead to eutrophication through excessive inputs.

The impounded, Vasse Wonnerup Wetland System (VWWS) in SW Western Australia is a highly modified system. The critical management issue in the VWWS is nutrient enrichment, which has triggered macroalgal and toxic blue-green algae blooms leading to anoxic conditions, severe fish kills, obnoxious odours and a reduction in the aesthetic beauty. The first step to reducing nutrient loads within the VWWS is to identify the sources of OM and nutrients so they can be specifically managed.

My PhD project will use bulk isotopic analyses ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) to determine particulate OM sources and $\delta^{13}\text{C}$ -DOC and $\delta^{15}\text{N}$ - of multiple dissolved inorganic and organic nitrogen species to determine dissolved nitrogen and carbon sources and describe their spatial and temporal variability in the VWWS. This will assist stakeholders in understanding nutrient inputs in the VWWS as a whole, and provide critical data for managing nutrient loads from particular parts of the catchment or at particular times of year. With rising sea levels and salt water intrusion increasing the need to manage our coastal areas, understanding OM and nutrient sources and cycling within this impounded system will provide valuable information for coastal managers considering impoundment around the world.

12.35 pm

**Wetland biodiversity patterning along the middle to upper Fortescue valley
(Pilbara: Western Australia) to inform conservation planning**

*Michael Lyons¹, Adrian Pinder¹, Margaret Collins¹, Loretta Lewis¹, Kirsty Quinlan¹,
Russell Shiel², Rebecca Coppen¹ and Faye Thompson¹

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² Ecology and Environmental Science, University of Adelaide

The Pilbara region's Fortescue Valley (upstream and downstream of Fortescue Marsh) has an especially high number and diversity of floodplain wetlands. These support distinct flora and fauna communities but are poorly represented in the region's formal conservation estate, so off-reserve management of these wetlands is important. Wetlands of this area have been identified as priority assets in several planning processes and listings, but there is relatively little information on their biological values and how these are distributed along the valley.

To address this, a survey of wetland biodiversity was undertaken to describe geographic patterning of wetland biodiversity along the middle reaches of the Fortescue Valley. The survey was part of the Pilbara Corridors Project; a collaboration between Rangelands Natural Resource Management WA, Greening Australia and Department of Biodiversity, Conservation and Attractions.

From the 47 wetland sites sampled for this project and some additional sites sampled during an earlier Pilbara-wide survey, we collected 590 aquatic invertebrate taxa and 284 riparian plant species. Broad geographic areas capturing differing components of the flora and fauna included Fortescue Marsh, the Jigalong-Fortescue floodplain, Roy Hill south of Fortescue Marsh (small ephemeral pans), river pools on Ethel Creek, Eriachne grasslands and floodplain wetlands of Mulga Downs, the large morphologically complex claypans of Mulga Downs and Coondiner Pool.

Patterns in the distribution of wetland flora and fauna revealed during this project were used to derive a number of principals to guide the geographic spread of wetland management programs.

12.40 pm to 1.30 pm

LUNCH

SESSION 3
(Facilitator: Linda Metz, City of Cockburn)

PANEL DISCUSSION

1.30 pm

Dr Jane Chambers

Senior Lecturer in Wetland Ecology
Murdoch University
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Suzanne Brown

Manager Drainage and Liveable Communities
Water Corporation
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James Duggie

Principal Policy Officer, Climate Change,
Department of Water and Environmental Regulation
Level 4, The Atrium, 168 St Georges Terrace, PERTH WA 6000
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2.30 pm to 2.50 pm

AFTERNOON TEA

2.50 pm to 4.00 pm

CONCURRENT WORKSHOP SESSION

Workshop 1 – Room 2

Typha management in a changing climate

*Adam Harris¹ and *Greg Keighery²

¹Environmental Officer, City of Cockburn

²Department of Biodiversity, Conservation and Attractions

Locked bag 51, Bentley Delivery Centre

E bjkeighe@it.net.au

Typha orientalis is a common coloniser in wetlands and has in some cases become weedy in nature as it displaces other native vegetation. Join Adam Harris from the City of Cockburn with special guest Greg Keighery from Department Biodiversity, Conservation and Attractions to learn more about this species including its recent reclassification in status, biology and management actions including control.

Workshop 2 – Room 1

Mapping tools to identify priority restoration projects to improve habitat connectivity

Renata Zelinova

Business Development Officer (Environmental Planning Tool)

Western Australian Local Government Association

Level 1, 170 Railway Parade, West Leederville 6007

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Following a short demonstration of data available to assess vegetation connectivity in the SW of Western Australia, workshop participants will be exploring the capabilities of the publicly available on-line Environmental Planning Tool in assisting with prioritising and designing restoration projects. The focus of the workshop will be on identifying gaps in habitat connectivity.

The public version of WALGA's Environmental Planning Tool (EPT) is designed to assist community groups undertaking natural area restoration to assist with planning, mapping and monitoring their works in a format that can be easily exchanged with land managers, such as Local Government of the Department of Biodiversity, Conservation and Attractions.

The EPT can be used to assist with the identification of ecological linkages at regional and local levels, to assess indicative environmental values and can be used to record and monitor vegetation condition, management actions and plan restoration projects. Access is provided to information on vegetation types by current and pre-clearing vegetation extent as well as to Reference Sites which summarise information on typical plant communities for the Swan Coastal Plain and Jarrah Forest in the Perth metropolitan area.

The EPT can be used to various types of files, including GIS software compatible shape files, which can be exchanged with others. The reporting function provides immediate access to information on area, vegetation type, vegetation conservation significance, proximity to wetlands and their buffers, proximity to protected areas or ecological corridors and other information relevant to natural resource management. The users can identify whether the Local Government where they are working adopted a Local Biodiversity Strategy.

Further benefits of using the EPT include the ability to load and display information collected in the field using a GPS or other methods with other relevant information not only an aerial photography; and an ability to undertake basic mapping without the need to purchase or access other GIS software and collect datasets.

A booklet of one page instructions to undertake specific EPT analysis will be provided to workshop participants, including instructions on how to access the EPT. The booklet will be used by the workshop participants to test how to use the EPT effectively and provide an easy guide for using the EPT after the workshop.

Workshop participants are welcome to use their own laptops with Wi-Fi internet access to follow the demonstrations.

Workshop 3 – Room 3

Mapping tools to identify priority restoration projects to improve habitat connectivity

Tegan Douglas

WA Citizen Science Project Coordinator

BirdLife Western Australia

Peregrine House, 167 Perry Lakes Drive, Floreat 6014

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Birds are visible indicators of wetland health, and can demonstrate the success and progress of restoration and ongoing management activities. BirdLife Australia has a long history of monitoring wetland birds, including resident waterbirds, migratory shorebirds and bush birds. The ongoing contribution of citizen scientists is instrumental in this work, with the compiled wealth of knowledge feeding directly into on-ground actions and guiding management decisions. In recent years BirdLife has shifted to a user-friendly app and web portal called Birdata to allow this work to continue. In this workshop we will explore how easy it is to use these BirdLife tools to monitor wetlands regardless of whether you are a recreational citizen scientist, a member of a friends group, or a land manager. We will incorporate a practical demonstration of how Birdata can work for you, both to submit surveys and to use the existing data to answer questions about our wetlands and their birds.

Workshop 4 – Demountable (meet at the train)

RIPPLE EFFECTS: How to grow community participation in wetland-friendly living

Anne Pettit

Pettit Projects WA Citizen Science Project Coordinator

BirdLife Western Australia

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The notion of ‘wetlands’ and their benefits for urban communities can be vague or not even on the radar for people, even though a lot of everyday habits are affecting wetlands in positive or negative ways. This workshop will explore these things, and provide a guide to using our interests and expertise to bring communities on board with wetlands appreciation and care.

Workshop 5 – Meet at the green shed

From wetland weeds to a wetland SPA (site visit)!

Denise Crosbie

Wetlands Officer

Cockburn Wetlands Education Centre Inc , 184 Hope Road, Bibra Lake WA 6163

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The wetland vegetation community at Bibra Lake has suffered from past land clearing practices and subsequent invasion by weeds. Since 2003 the Cockburn Wetlands Education Centre, with support from the City of Cockburn, has undertaken a variety of trials to develop practical techniques for re-establishing the wetland vegetation

communities. The project aimed to create reasonably self-sustaining vegetation communities that would also function as a wetland seed production area (wet SPA) to supply locally provenanced seed for annual revegetation projects.

The site visit will pass through an annual sequence of works dating back to 2003 and examine the practical techniques used including seed collection and propagation, initial site preparation, revegetation and maintenance. Photomonitoring records will demonstrate the changes over time. A highlight of the visit will be the Narma Kullarck floating boardwalk. Please wear enclosed shoes, a hat and bring a water bottle. (Please note: some delegates may have participated in this site visit at previous conferences. The visit is primarily aimed at new attendees).

ADDITIONAL DISPLAYS IN GARDENS

Engagement through Community Biodiversity Projects that are Educational Inclusive and Fun

Angela Rossen

Environmental Science Art Projects

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Angela Rossen is an artist who works with animal and plant biologists to deliver environmental education with community groups and in schools throughout Western Australia. Her workshops take participants out into nature to observe and record the living things in the environment.

Using both science and art methodologies participants gain an understanding of whole system ecology, plant and animal zonation, adaption and feeding relationships. Artworks that document whole environmental systems are collaboratively created.

Micro bats at Bibra Lake

Joe Tonga

Natsync Environmental

25 Oakover Street, East Fremantle

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Unheard of.....three species of micro bats have taken to the bat boxes at Bibra Lake. No tree hollows in sight.

This site has 15 different bat box models, testing the uptake of the bats in their quest for the best home.

After conducting a survey of all the bat boxes in the City of Cockburn area, information gathered has been used to construct a new model that offers all the features that our little furry friends need.

See the latest bat detectors, thermal devices and other gear that researchers use to learn about the bats.

NETWORKING LIST (please enjoy networking)

Cliff	Ahrens	City of Cockburn
Vanessa	Allan	City of Mandurah
Sarah	Anderson	Edith Cowan University
Lauren	Andrews	City of Cockburn
Fintan	Angel	Wetland Research & Management
Ben	Atkinson	Greenskills
Dr Felicity	Bairstow	The Wetlands Centre
Jan	Bant	Friends of Lightning Swamp
Dr Catherine	Baudains	Murdoch University
Ronda	Beck	
Benita	Begley	City of Mandurah
Rebekah	Bigalia	Murdoch Environmental Restoration Group
Joan	Boardman	City of South Perth Environment Association
Warwick	Boardman	City of South Perth Environment Association
Lindsay	Bourke	Department of Biodiversity, Conservation and Attractions
Natasha	Bowden	Cockburn Wetlands Centre
Jo	Bower	Friends of Mayland Samphires
Trish	Bradly	
Kobi	Bradshaw-Chen	City of Armadale
Jared	Bray	Town of Claremont
Karl	Brennan	Department of Biodiversity, Conservation and Attractions
Shad	Bridger	City of Mandurah
Paul	Bridges	
Claire	Brittain	Friends of Lake Claremont Ltd
Helen	Brookes	Urbaqua
Penny	Brooshooft	Biota Environmental Sciences
Suzanne	Brown	Water Corporation
Heidi	Bucktin	Department of Biodiversity, Conservation and Attractions
Christine	Burtenshaw	City of Armadale
Ben	Byrne	Parks and Wildlife Service
Dallas	Campbell	Murdoch Environmental Restoration Group
Phillipa	Carboon	Yanchep National Park
Dr Jane	Chambers	Murdoch University
Wayne	Childs	DBCA
Elaine	Christy	Cockburn Wetlands Centre
Bonita	Clark	Wetland Research & Management
Mark	Cliff	Waterbird Conservation Group
Sue	Conlan	Friends of Mosman Park Bushland
Dr Robin	Connolly	Hydrologia
Caitlin	Conway	SERCUL
Rebecca	Cooper	City of Bayswater
Dr Michael	Coote	Department of Biodiversity, Conservation and Attractions
Diana	Corbyn	Wildflower Society
Denise	Crosbie	Cockburn Wetlands Centre
Gary	Cross	City of Bayswater
Melanie	Davies	WALGA
Tom	de Silva	Stantec

Paul	Desmond	
Alex	Devine	City of Bayswater
Cloe	Dolan	Town of Claremont
Tegan	Douglas	BirdLife Western Australia
James	Duggie	Department of Water and Environmental Regulation
Lovette	Duncan	
Steve	Dutton	Parks and Wildlife Service
David	Dyke	Bardon Park Friends Group
Tony	Eddleston	DBCA
Dr Paul	Erftemeijer	University of Western Australia
Fiona	Felton	Dept. of Biodiversity, Conservation and Attractions
Tim	Fisher	Department of Biodiversity, Conservation and Attractions
Laura	Folan	Earth Assist - CVA
Sealin	Garlett	
Wesley	Garlett	City of Cockburn
Julie	Ginbey	SERAG
Molly	Gordon	City of Mandurah
Mary	Gray	Urban Bushland Council WA Inc.
Matt	Grimbly	SERCUL
Michael	Hammond	Department of Water and Environmental Regulation
Adam	Harris	City of Cockburn
Anne	Harris	Dept. of Biodiversity, Conservation and Attractions
Vicky	Hartill	City of Cockburn
Josephine	Heffernan	
Crystal	Heydenrych	Stantec
Jennifer	Higbid	Department of Biodiversity, Conservation and Attractions
Hans	Hoette	Friends of Lightning Swamp
Bill	Hollingworth	City of Albany
Pierre	Horwitz	Edith Cowan University
Brooke	Hudson	City of Mandurah
Tom	Hughson	Conservation and Parks Commission
Mark	Hutchison	Wetlands Conservation Society
Veronica	Ingrilli	City of Cockburn
Jennifer	Jackson	Parks and Wildlife
Karen	Jackson	DBCA
Darryl	James	
David	James	Friends of Forrestdale
Nonie	Jekabsons	
Dr Aaron	Jenkins	Edith Cowan University
Philip	Jennings	Wetlands Conservation Society
Linda	Johnson	Friends of Moore River Estuary
Moss	Johnson	
Samantha	Jones	City of Cockburn
Dr Simon	Judd	Edith Cowan University
Greg	Keighery	Department of Biodiversity, Conservation and Attractions
Jake	Kelly	City of Mandurah
Cory	Kennedy	City of Mandurah
Matthew	Kennewell	City of Cockburn
Dayle	Kenny	Swan Foreshore Protection Association Inc

Leah	Knapp	Murdoch University
Gerald	Kuchling	Department of Biodiversity, Conservation & Attractions
Sonia	Lamond	GeoCatch
Paul	Lawrence	City of Joondalup
Penny	Lee	Baigup Wetland Interest Group
Natalie	Lees	City of Mandurah
Beverley	Lockley	Katanning Landcare
Isaac	Lorca	Isaac Lorca
Sam	Lostrom	Stantec
Michael	Lyons	Department of Biodiversity, Conservation and Attractions
Kevin	Mack	Bardon Park Friends Group
Sophie	Madaffari	City of Joondalup
Elizabeth	Mason	MBS Environmental
Margaret	Matassa	Swan Estuary Reserves Action Group
David	Maynier	
Lisa	Mazzella	Department of Water and Environmental Regulation
Rosh	McCallum	Edith Cowan University
Kelli	McCreery	One Tree Botanical Pty Ltd
Ciara	McIllduff	Yanchep National Park
Kevin	McLeod	Friends of Yellagonga Regional Park Inc
Sharon	Meredith	Peel-Harvey Catchment Council
Linda	Metz	City of Cockburn
Wayne	Motteram	Friends of Claughton Reserve
Peter	Muirden	
Melissa	Mykytiuk	Town of Bassendean
Robin	Napier	SERAG
Tanmoy	Nath	State Natural Resource Management Program
Andrew	Newland	City of Belmont
Corinne	Omacini	City of Armadale
Cale	O'Malley	
Lara	ONeill	City of Joondalup
Catherine	O'Neill	
Sapphire	Osborne	City of Joondalup
Grazyna	Paczkowska	DBCA
Debbie	Payne	
Ezgi	Perincek	Department of Biodiversity Conservation and Attractions
Anne	Pettit	Pettit Projects
Dr Neil	Pettit	University of Western Australia
Giles	Pickard	City of Subiaco
Robyn	Pickering	BirdLife Australia
Adrian	Pinder	Department of Biodiversity, Conservation and Attractions
Catherine	Prideaux	Department of Biodiversity, Conservation & Attractions
Mary	Rath	
Viv	Read	
Yolanda	Rhemrev	City of Bayswater
Darren	Robins	City of Belmont
Michelle	Rose	City of Bayswater
Angela	Rossen	University of Western Australia
Rex	Sallur	Cockburn Wetlands Centre

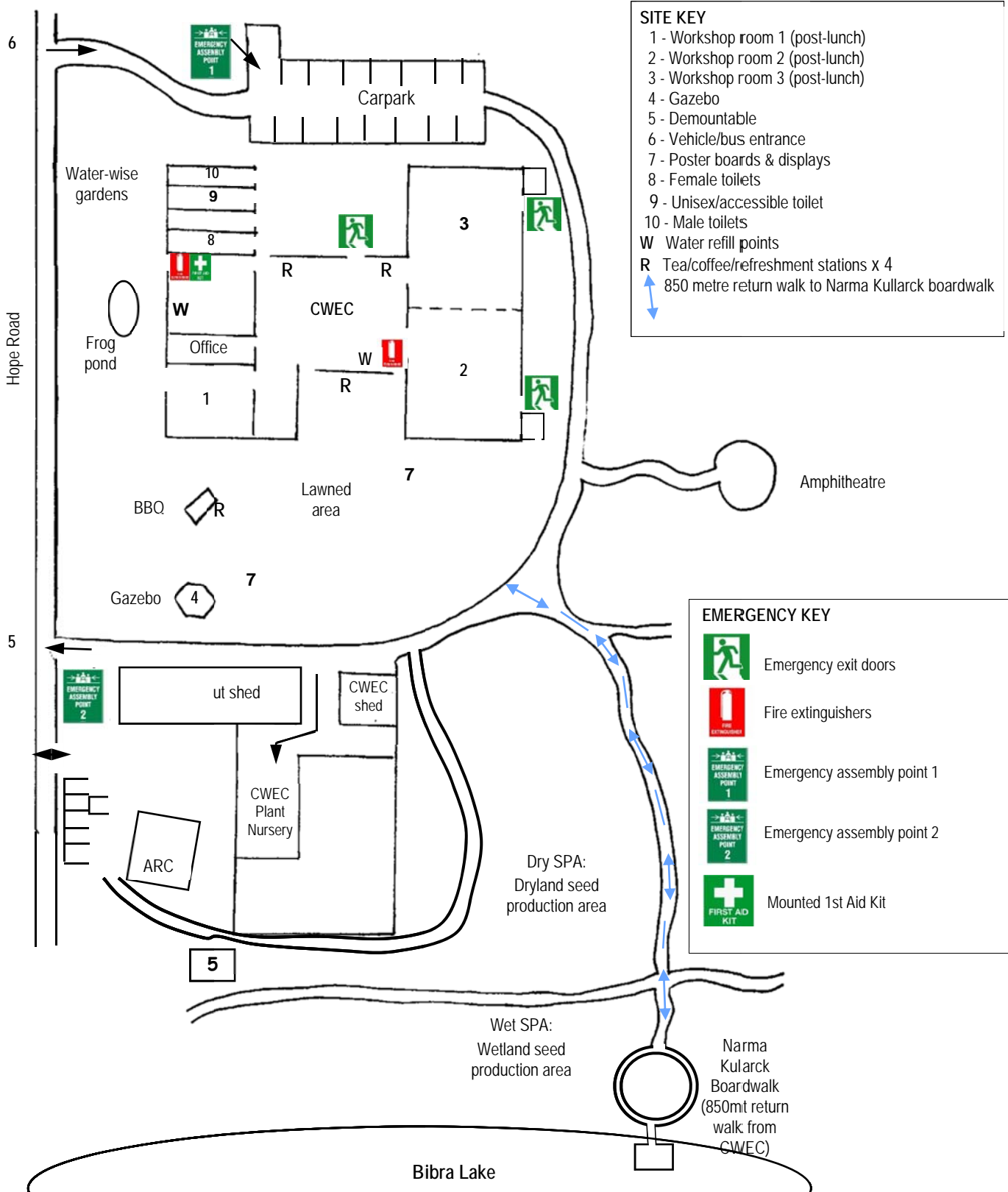
Clr Chontelle	Sands	City of Cockburn
Nakisa	Shahrestani	Edith Cowan University
Shelley	Shepherd	Urbaqua
Ingrid	Sieler	Perth NRM
Deb	Slater-Lee	State NRM Office
Tiffany	Southcott	DBCA
Jane	Spinks	City of Cockburn
Paddy	Stranno	City of Armadale
Darcy	Sutton	City of Mandurah
Carolyn	Switzer	
Christine	Taylor	Department of Biodiversity, Conservation & Attractions
Paul	Tholen	Department of Biodiversity, Conservation and Attractions
Tess	Tholstrup	Baigup Wetland Interest Group
Kate	Thompson	Bardon Park Friends Group
Jess	Thomson	City of Mandurah
Cyril	Toman	
Jenny	Tomkins	Department of the Environment and Energy
Joe	Tonga	Natsync Environmental
Connie	van den Ende	Friends of Calughton Reserve
Jan	van der Walt	Greenskills
Mary	van Wees	City of Bayswater
Peter	Wahlsten	FRAGYLE
Dan	Walker	City of Armadale
Sean	Waters	City of Joondalup
Lesleyann	Watson	WildlifecareWA
Gavin	Waugh	
Rose	Weerasinghe	SERCUL
Hilary	Wheater	FRAGYLE
Peter	White	Department of Biodiversity, Conservation and Attractions
Liam	Whiting	Friends of Upper Lesmurdie Falls
Grace	Wilkinson	Edith Cowan University
Cat	Williams	SERCUL
Gerrie	Williams	Friends of Claughton Reserve
John	Williams	Friends of Lightning Swamp
Kim	Wilson	Peel-Harvey Catchment Council
Alan	Wright	Dept. of Biodiversity, Conservation and Attractions
Renata	Zelinova	WALGA

Please say hi to all our amazing volunteers that aren't listed above but have contributed to this event in so many ways!






Angie, Carol, Dani, Dee, Di, Doug, Hayden, Laksh, Lily, Matt,

Nathan, Pat, Ray, Rex, Rick, Rohit, Steve, Suparna, and Terri.

EMERGENCY EVACUATION MAP & SITE PLAN



- SITE KEY**
- 1 - Workshop room 1 (post-lunch)
 - 2 - Workshop room 2 (post-lunch)
 - 3 - Workshop room 3 (post-lunch)
 - 4 - Gazebo
 - 5 - Demountable
 - 6 - Vehicle/bus entrance
 - 7 - Poster boards & displays
 - 8 - Female toilets
 - 9 - Unisex/accessible toilet
 - 10 - Male toilets
 - W Water refill points
 - R Tea/coffee/refreshment stations x 4
 - ↔ 850 metre return walk to Narma Kullarck boardwalk

- EMERGENCY KEY**
-  Emergency exit doors
 -  Fire extinguishers
 -  Emergency assembly point 1
 -  Emergency assembly point 2
 -  Mounted 1st Aid Kit