



E-PROGRAM

17th annual WA Wetland Management Conference 2021

Celebrating World Wetlands Day
and the
50th anniversary of the
Ramsar Convention on Wetlands

Tuesday 16 March 2021 (rescheduled)
9am to 4.15pm



Lake Mealup, part of the Ramsar-listed Peel-Yalgorup Wetland System, Site 482. Western Australia

**Mandurah Performing Arts Centre
9 Ormsby Terrace
Mandurah, Western Australia**

Conference Program

(*Denotes speaker, where there are multiple authors)

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

Opening

- 9.00am Opening remarks
Emeritus Professor Philip Jennings, Wetlands Conservation Society Inc
- Welcome to country
George Walley, Mandjoogoordap Dreaming

SESSION 1 Chairperson: Linda Metz, City of Cockburn

Keynote presentation

- 9.20am Caring for our Ramsar 482 Wetlands: values, threats and actions
*Dr Steve Fisher, Rick James, Sharon Meredith, Charlie Jones, Mike Griffiths, Jennie Beeson, Jo Garvey, Jesse Rowley and Kim Wilson, Peel-Harvey Catchment Council

Plenary presentations 1

- 9.50am A linked-up collaborative management approach to restoring Ramsar 482
*Johanne Garvey, *Mike Griffiths, Jesse Rowley, Rick James and Steve Fisher, Peel-Harvey Catchment Council
- 10.04am The Yalgorup Lakes – A baseline characterisation to inform future management
*Rick James and Jennie Beeson, Peel-Harvey Catchment Council
- 10.17am Wetlands and People: A catchment scale approach to community engagement in the Peel-Yalgorup Ramsar System
Charlie Jones*, Sharon Meredith, Jo Garvey, Jesse Rowley and Kim Wilson, Peel-Harvey Catchment Council

Poster presentations 1

- 10.30am Re-Imagining Wetlands in Perth: recreating our wetland landscape in the Perth-Peel region through historical photographs and maps
*Tracy de Vetter, NatureLink Perth, Murdoch University
- 10.35am The Black Bream Stock Enhancement Project: Pilot Programs don't follow the rules!
John Tonkin College Teachers Barbara Sing, Amanda Zele and Year 9 students

10.40am Morning tea

SESSION 2 Chairperson: Dr Michael Coote, Department of Biodiversity, Conservation and Attractions

Plenary presentations 2

- 11.20am Voicing Wetlands: Celebrating Living Relationships of Love and Care
Adjunct Professor Anne Poelina¹, Professor Len Collard², Professor Pierre Horwitz³, Professor Laurie Guimond⁴ and Associate Professor Sandra Wooltorton¹,
¹Nulungu Research Institute, University of Notre Dame, Broome,
²School of Indigenous Studies, University of Western Australia, Dalkeith
³School of Science, Edith Cowan University, Joondalup
⁴School of Geography, University of Quebec a Montreal
- 11.40am Wetland Challenges and Opportunities in the Lake Muir-Unicup and Upper Kent catchments
*Geoff Evans¹ and Basil Schur²
¹Denmark Environment Centre
²Green Skills
- 12 noon Partnering to Protect our Waterways
*Bonnie Beal Richardson¹, *Robyn Bickell², Kirstin Field³, *Natalie Goddard⁴, *Charlie Jones⁵, Sally Kirby⁶, *Sharon Meredith⁷, Krista Nicholson⁸, *Ash Ramm⁹ and *Barb Sing¹⁰
¹City of Mandurah

- ²Mandurah Volunteer Dolphin Rescue
- ³Coastal Waste Warriors
- ⁴Mandurah Cruises
- ⁵Peel-Harvey Catchment Council
- ⁶Mandurah Volunteer Dolphin Rescue
- ⁷Volunteer
- ⁸Murdoch University
- ⁹Tackle World Miami
- ¹⁰Estuary Guardians

Poster presentations 2

- 12.20pm Diatoms and algal blooms: Evaluating the success of an additive used to control noxious blue-green algal blooms in urban wetlands
Syngeon Rodman and *Jess Delaney, Biologic Environmental Survey
- 12.25pm Saint Leonards Creek: What's in our backyards?
*Alison McGilvray¹, *Michelle Crow¹ and Melinda McAndrew²
¹Department of Biodiversity, Conservation and Attractions, Rivers and Estuaries Branch
²City of Swan
- 12.30pm Soldiers Cove Water Wise Wetland
Dale Robinson, City of Mandurah, Peel Harvey Catchment Council and Department of Water and Environmental Regulation
- 12.35pm Update on Australian Government Wetland Management Activities
Alex Tomlinson, Australian Government Department of Agriculture, Water and the Environment

12.40pm Lunch

SESSION 3 Chairperson: Bob Pond, Department of Water and Environmental Regulations

Plenary presentations 3

- 1.40pm Community, Local Government and funding bodies working together to restore wetlands of the Derbarl Yerrigan
*Alex Devine¹ and *David Dyke²
¹City of Bayswater
²Friends of Bardon Park Wetland
- 2.00pm The Lake Richmond Thrombolites: an assessment of thrombolite health and their sensitivity to herbicides
Rory Garven, City of Rockingham
- 2.20pm Bindjareb Gabi Wonga – Bindjareb Water Story
*George Walley¹ and *Bronte Grant²
¹Mandjoogoordap Dreaming
²Department of Water and Environmental Regulation

Poster presentations 3

- 2.40pm Rehydration trials to identify resident flora and fauna from ephemeral wetlands and creeks
*Kim Nguyen, Syngeon Rodman, Jess Delaney, Biologic Environmental Survey
- 2.45pm Resident bottlenose dolphins occupying the Ramsar-listed Peel-Harvey Estuary and how they face risks from live stranding events and entanglements in fishing gear
Krista Nicholson, PhD Candidate, Centre for Sustainable Aquatic Ecosystems, Harry Butler Institute, Murdoch University
- 2.50pm Closing remarks
Tom Perrigo, Chairperson, The Wetlands Centre Cockburn

2.50pm Afternoon tea

Session 4

Workshop concurrent session

3.05pm 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: How can Ecotourism create enhanced appreciation of wetland environments?

Presenters: Jamie Van Jones and Sebastian 'Base' Jones, Co-Directors, Salt and Bush Eco Tours

Location: Alcoa Mandurah Art Gallery

How can Ecotourism find a balance in creating appreciation for our wetland environments, while limiting the impacts of tourism on these fragile ecosystems? Hear from a local ecotourism operator how they are showcasing the Peel-Harvey Wetlands while trying to educate and protect them at the same time.

Workshop 2: Turtle Tracking in the City of Cockburn - Where to next?

Presenters: Rafeena Boyle, Environmental Education Officer, City of Cockburn

Vicky Hartill, Environmental Education Officer, City of Cockburn

Location: Dance Studio

To reduce mortality rates in Bibra Lake's native turtle population, in 2019 the City of Cockburn in partnership with Murdoch University, Parks & Wildlife Services, Native ARC and The Wetlands Centre, Cockburn launched the Turtle Trackers citizen science program to help protect nesting females, their nests and eggs during the peak of the nesting season.

Following two seasons, the program is sparking interest from nearby councils, land management groups and the broader community, but to roll the program out to other lakes some changes to its current structure will be needed.

In this workshop we will discuss the pros and cons of the 2019 & 2020 Turtle Tracker program, the challenges facing its roll out beyond Bibra Lake, and workshop different scenarios for future management of this program.

Workshop 3: Developing a biodiversity database for Reserve management

Presenters: Judy Fisher PhD, Ethical, Independent Socio-Ecologist, Director, Fisher Research Pty Ltd, Twitter @judithfish, Elected Member IPBES Multidisciplinary Expert Panel IUCN, Commission on Ecosystem Management

Theme Leader: Ecosystems and Invasive Species, Research Associate Western Australian Museum, Adjunct Institute of Agriculture University of Western Australia

Eryn Jackson, City of Mandurah

Cory Kennedy, City of Mandurah

Location: Fishtrap Theatre

The City of Mandurah has been utilising the IUCN Ecosystems and Invasive Species Thematic Group's best practice approach to the management and restoration of Reserves. Using this approach, the City has implemented plans across 18 Reserves including several adjacent the Peel-Harvey Estuary Ramsar Site.

Using a mobile mapping application, we establish "polygons" (or "areas") with the same weed cover value using 5 categories. We then record the native and weed species present within each area. The information recorded in the field is incorporated directly from the mapping application into a Geographic Information System (GIS), which can be used by land managers, traditional owners and others to make informed decisions on where and how to manage weed species and restore ecosystems.

Post management, we return to the "polygons" and again record the weed cover value and weed and native species present. We can measure ecological change, both by weed cover value and weed species present over time. In addition, we keep a record of funds spent in managing and or restoring that area, including volunteer time, and make a calculation to understand how successful our weed work has been.

This "Success Indicator" is based on the ecological change and the economic investment in the area. With this Success Indicator we have a highly effective understanding of our weed management and restoration and are

able to adapt our approaches based on a quantitative understanding of how effective our management has been.

The workshop will outline to participants the approach used, including an interactive demonstration of the mapping application, and transfer of data into the GIS system and how this biodiversity dataset is guiding the management of City of Mandurah Reserves.

The workshop will be highly interactive with the aim of guiding those who wish to utilise this approach in the restoration and management of their wetlands, Ramsar sites and TEC's. There will be ample time for discussion and explanation of the benefits of this approach to management and restoration.

Workshop 4: Migratory Shorebird Conservation – We can all play a role

Presenter: Dr Vicky Stokes, WA Program Manager, BirdLife Australia

Location: Boardwalk Theatre

Shorebirds are mostly associated with wetlands and are an important indicator of their health and productivity. They are a diverse group of elegant birds, some of which carry out the most amazing migrations in the natural world. Unfortunately, due to ongoing declines they are one of the most threatened group of birds globally. This workshop will introduce participants to tips for identifying different groups of shorebirds, the types of habitats used by shorebirds and how to identify important sites. Participants will have the opportunity to learn about and discuss threats to shorebirds and ideas for addressing impacts of recreational disturbance.

NB: On Sunday 31st January 2021, teams of volunteers will be taking part in the [National Shorebird Monitoring Program's](#) annual shorebird count at various sites around the Peel-Yalgorup System. If you would like to learn more about this citizen science program, please contact Charlie at charlie.jones@peel-harvey.org.au

4.15 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!





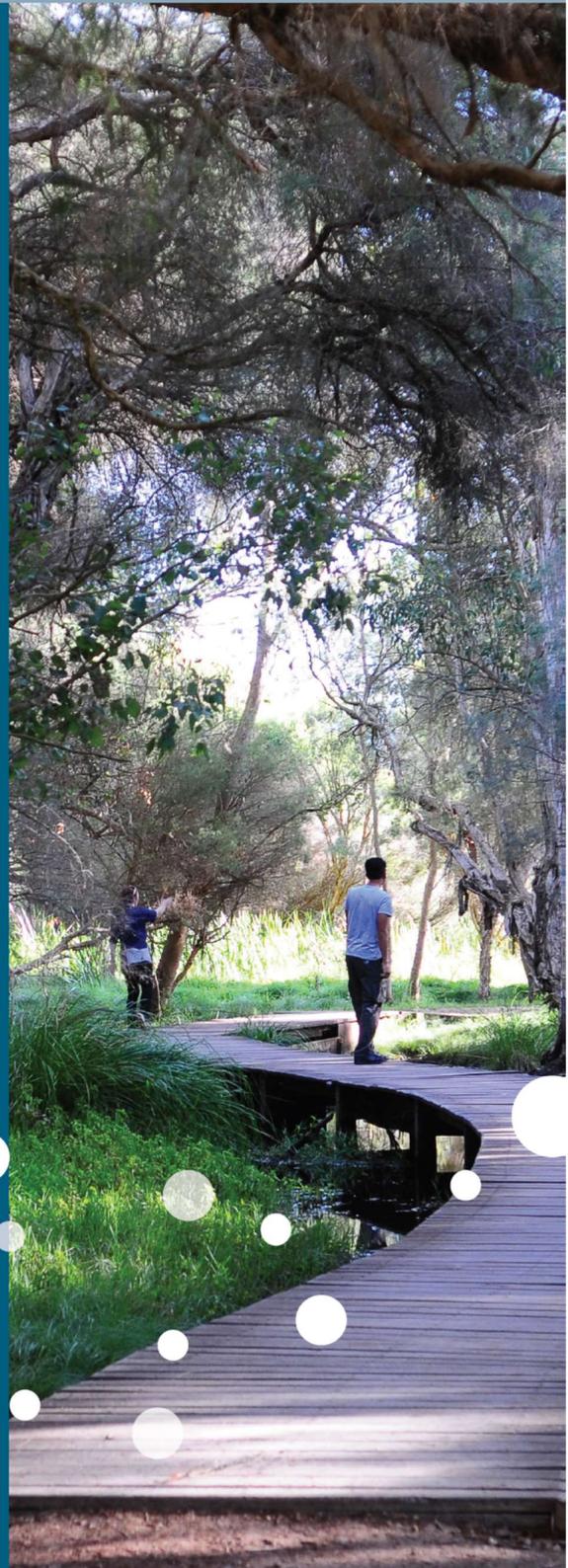
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Department of **Water and Environmental Regulation**

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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 171 Contracting Parties, up from 21 initial signatory nations in 1971. The Ramsar list of Wetlands of International Importance now includes 2,416 sites covering 254,551,385 hectares.

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 2021

The international theme for World Wetlands Day 2021 follows the Ramsar theme of 'Wetlands and Water'. This year's theme shines a spotlight on wetlands as a source of freshwater and encourages actions to restore them and stop their loss. We are facing a growing freshwater crisis that threatens people and our planet. We use more freshwater than nature can replenish, and we are destroying the ecosystem that water and all life depend on most – Wetlands. The 2021 campaign highlights the contribution of wetlands to the quantity and quality of freshwater on our planet. Water and wetlands are connected in an inseparable co-existence that is vital to life, our wellbeing and the health of our planet.

KEY MESSAGES

Fresh and saltwater wetlands sustain humanity and nature. They support our social and economic development through multiple services:

- Store and clean water.
- Keep us fed.
- Underpin our global economy.
- Provide nature a home.
- Keep us safe.

Life thrives in wetlands.

For further information about the key messages, and World Wetland Day 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 Wetlands Centre Cockburn gratefully acknowledges the generous support of the following sponsors and supporters that allow us to keep the registration fees at a minimum.

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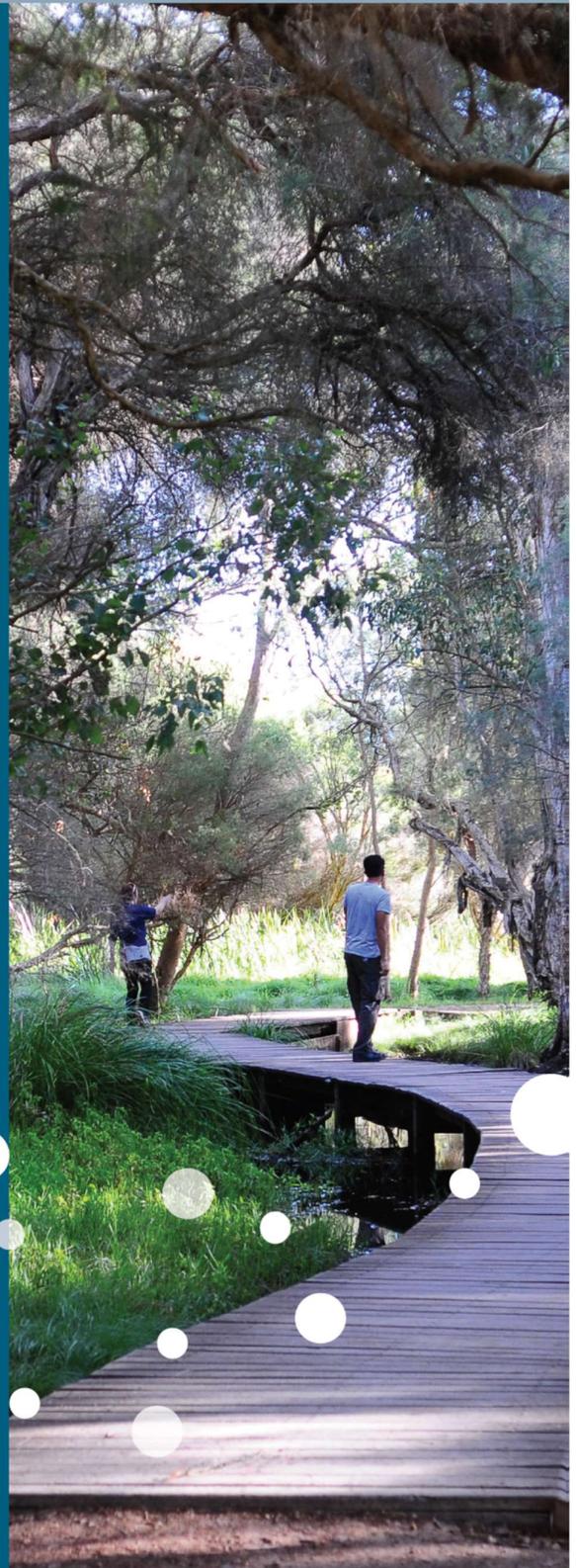
Government of **Western Australia**
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OPENING

9.00 am

Opening remarks

Emeritus Professor Philip Jennings,
Chairperson, Wetlands Conservation Society Inc

9.10 am

Welcome to country

George Walley
Mandjoogordap Dreaming

George is a community Leader of the local Bindjareb Noongar people. In George's professional life he has been a primary school teacher, who now works in the health field. He has over many years been an educator in cultural education and cultural awareness. He has lectured in Aboriginal education and Aboriginal health at a tertiary level. George is also a community resource person in cultural knowledge to local governments, schools, networking agencies, and education students doing assignments. He has been teaching Noongar language for people who have an interest in conversational Noongar. He is on various boards and appreciates that his presence is based on a long time mutual respect for community. George loves going bush and finding time to relax, playing the guitar and spending time with family and friends.

SESSION 1

Chairperson: Linda Metz, City of Cockburn

KEYNOTE PRESENTATION

9.20 am

Ramsar speaker

Caring for our Ramsar 482 Wetlands: values, threats and actions

*Dr Steve Fisher, Rick James, Sharon Meredith, Charlie Jones, Mike Griffiths,
Jennie Beeson, Jo Garvey, Jesse Rowley and Kim Wilson

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The 26,530 ha Peel-Yalgorup System is one of the largest and most diverse Ramsar-listed wetland systems in Australia, incorporating the Peel-Harvey Estuary, the hypersaline Yalgorup Lakes and the relatively freshwater lakes McLarty and Mealup. Also known as Ramsar Site 482, the wetland system meets at seven of the nine criteria for listing according to the Ramsar Convention as a 'wetland of international importance'. These values are threatened by the rapidly growing urban population and land-use practices and without action the threats will continue unabated, potentially compromising the site's listing under the Ramsar Convention.

The Australian Government has international obligations to maintain the ecological health of the system and to provide migratory bird habitat under international agreements. To this end, in 2018 the Peel-Harvey Catchment Council (PHCC) secured funding through the National Landcare Program / Regional Land Partnerships to meet the Australian Government's two primary medium-term outcomes that by 2023:

- there is restoration of, and reduction in threats to, the ecological character of Ramsar sites, (i.e. the Peel-Yalgorup System) through the implementation of priority actions; and
- the implementation of priority actions is leading to an improvement in the condition of EPBC Act listed of EPBC Act listed Threatened Ecological Communities (the thrombolite community at Lake Clifton).

This presentation provides an introduction to PHCC's strategy to achieving these outcomes delivered through its 'Wetlands and People' project through the following activities, which will be described in detail in the subsequent plenary presentations:

- i. On-ground actions including revegetation, weed control, pest animal control, and controlling vehicle access on "patches" within and adjoining the Ramsar 482 Site
- ii. Assessing the Ecological Character of the site and addressing key knowledge gaps, including reviewing and updating the Ecological Character Description for Ramsar 482; implementing monitoring programs, developing a report card for the condition of the Ramsar 482 Site and improving the understanding of the hydrology of Lake Clifton
- iii. Collaborative management of the site through the Ramsar Technical Advisory Group (TAG)- and subsidiary TAGs for components of the Ramsar Site; and
- iv. Community Engagement: capturing the hearts and minds of our community to raise awareness of, connect with, and understand Ramsar 482's values and build their capacity to act to protect through the 'Wetlands & People Plan for Ramsar 482', Australia's first site specific, stand-alone Communication, Education, Participation and Awareness (CEPA) Action Plan.

The presentation also includes an overview of PHCC's approach to improving the health of the Serpentine, Murray and Harvey rivers that provide the lifeblood to the estuary and the Ramsar Site 482 through its Healthy Waterways projects funded by the Alcoa Foundation and the Western Australian State Government.

9.50 am

PLENARY PRESENTATIONS 1

A linked-up collaborative management approach to restoring Ramsar 482

*Johanne Garvey, *Mike Griffiths, Jesse Rowley, Rick James and Steve Fisher

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The Peel-Yalgorup Wetlands System at 26,530 hectares is one of the largest and most diverse Ramsar-Listed wetland systems (site 482) in Australia, meeting at least six of the nine Ramsar criteria. These ecological values are threatened by the rapidly growing urban population and land-use practices, so it is vital that we intervene through strategic on-ground actions to

address key threats and threatening processes such as habitat fragmentation and loss of connectivity in our landscape, invasion of pest plants and animals to our bushland and waterways (drains, creeks, streams, rivers and estuaries) and human disturbance to native wildlife and habitat. The Peel-Harvey Catchment covers an area of nearly 12,000 km², consisting of waterways, natural bushland and developed urban and rural areas. . As the catchment contributes to the condition of the downstream Ramsar Site, restoration works need to be undertaken at a landscape scale. Over the past three years, the Peel-Harvey Catchment Council (PHCC), has developed a set of large landscape-scale projects, through which we link up on-ground restoration activities such as weed control, revegetation, bank stabilisation and feral animal control aimed at addressing key threats to our Ramsar 482 wetlands. In this presentation we showcase examples of these activities undertaken on and adjacent to the Ramsar 482 Site as well as upstream in and around the lower reaches of our rivers. These examples illustrate the benefits of working closely with the community using initiatives such as Devolved Grants and targeted Landholder Works Agreements to deliver key onground activities such as weed and feral animal control, revegetation and debris removal on privately-owned landholdings, in addition to working on land managed by the government. Through this method of delivery we continue to kick goals, providing opportunities for people to learn and upskill whilst also addressing threats and threatening processes. We will also describe monitoring programmes we have implemented to measure the medium and long-term success (or otherwise) of our restoration works. We will also present a summary of the outputs and outcomes we have achieved over the past three years through this linked-up, collaborative management approach to on-ground works aimed at maintaining and improving the condition of the catchment and the health of the catchment and the Peel-Yalgorup Wetlands System Ramsar Site itself.

10.04 am

The Yalgorup Lakes – A baseline characterisation to inform future management

*Rick James and Jennie Beeson

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The Yalgorup Lakes System forms part of the Peel-Yalgorup Wetlands, Ramsar Site 482. The System comprises 17 discrete waterbodies stretching over 43 km in a line parallel to the coast south of Mandurah. Lake Clifton, with its community of thrombolites, is perhaps the most well-known and studied of these, as is the 26 km long Lake Preston. In general, however, the smaller lakes have received less attention with little or no history of regular assessments in the past. As part of PHCC's Australian Government funded 'Wetlands and People' project, a five year program of monthly wetland assessments commenced in 2019 including all 17 waterbodies in the System. Monthly in-situ readings for pH, salinity and dissolved oxygen are augmented by quarterly sampling and laboratory analysis to better understand the chemical processes occurring in the lakes. Unlike most previous water quality surveys across the System, the Yalgorup Lakes Surface Water Quality Monitoring (YLSWQM) program includes measurements of lake level taken during each assessment round compared with survey benchmarks that were installed for this purpose. Matching

water quality data to lake level is important in this system where levels can vary by a metre or more over the year. In addition, the assessments also include basic monitoring of benthic flora and other wetland characteristics. In this presentation we will show how the YLSWQM program is providing valuable benchmark data for each waterbody in the System, including some at which no previous assessments have been recorded. In addition to this, a review of historical data is being undertaken and this is being combined with observations from the current program to develop a dynamic picture of change over time. Understanding wetland evolution is important when framing management decisions. If the trajectory of change over time is understood then informed management is possible; for example does the recorded change represent natural evolution for a waterbody of this type or are there other factors at play? If the change is deemed undesirable, what processes are driving this and what options are there to slow or redirect change in the future? We will also discuss how the answers to these questions are particularly important in the management of Lake Clifton, where the Threatened Ecological Community of thrombolites is under threat from an apparently rapid rise in salinity over the past four decades.

10.17 am

**Wetlands and People: A catchment scale approach to community engagement
in the Peel-Yalgorup Ramsar System**

*Charlie Jones, Sharon Meredith, Johanne Garvey, Jesse Rowley and Kim Wilson

Peel-Harvey Catchment Council

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Wetlands and waterways are key features of Peel-Harvey's environment. Many provide important habitat for wildlife and waterbirds, and are used for recreation, tourism, commercial fishing and education. Lead natural resource management agency for the region the Peel Harvey Catchment Council (PHCC) promotes an inclusive, catchment scale approach in protecting and restoring the region's natural assets. In particular, this approach is being employed for the protection of the Peel-Yalgorup System recognized as wetlands of international importance under the international Ramsar convention as Ramsar Site 482. PHCC has developed a 10-year Wetlands and People Plan for Ramsar 482, Australia's first site specific, stand-alone Communication, Education, Participation and Awareness (CEPA) Action Plan, which maps a path to capture the hearts and minds of our community to encourage wise use of the wetlands, advocacy for their protection and to increase community stewardship and support for the wetlands system. Two years into implementation of this plan, this presentation will outline the catchment-scale approach to community engagement and provide an update on our progress. Through various large scale projects. PHCC's community engagement covers the geographic scope of the catchment that feeds into the Ramsar 482 site. These projects include "Wetlands and people - a community restoring the ecological character of the Peel-Yalgorup Ramsar 482 Wetlands" (supported by the Australian Government's National Landcare Program), and 'Healing Bilya' (supported by the Alcoa Foundation). Two years in to the five year Wetlands and People Project, PHCC has delivered events, workshops, field days and conferences that have engaged with more than 13,000 community members and 95 groups including community groups, businesses and industry groups, schools and other education providers. We will

present an overview of the Wetlands and People approach and case studies including key outcomes of flagship activities involving community members of all ages, ranging from PHCC's participation in the East Asian Australasian Flyway Partnership CEPA International Workshop in 2018 in Manilla to share information on successful CEPA initiatives with practitioners from other Ramsar Sites, to annual Wetlands Weekender Festivals, and a multi-year series of school excursions in partnership with Greenfields Primary School.

POSTER PRESENTATIONS 1

10.30 am

Re-Imagining Wetlands in Perth: recreating our wetland landscape in the Perth-Peel region through historical photographs and maps

*Tracy de Vetter

Murdoch University/NatureLink

E naturelinkperth@murdoch.edu.au

A call to arms to gather photographic documentation of the changes to Perth's Wetlands since European settlement. A research project to investigate the changes to wetlands ecological character and public perception.

10.35 am

The Black Bream Stock Enhancement Project: Pilot Programs don't follow the rules!

*Barbara Sing, *Amanda Zele and Year 9 students

John Tonkin College

E Barbara.Sing@education.wa.edu.au

Black Bream have been a key recreational fish species in the rivers of the Peel-Harvey Estuary for the Mandurah community however, the population has faced decline over recent years. The reasons for this poor decline are unclear, but possible causes include unsuitable water quality during spawning or loss of adult females capable of breeding from recurring fish kills over the past decade or so.

Analysis of the Bream fishery by Dr Alan Cottingham and his team from Murdoch University found the Black Bream were both old and appearing in very low numbers. This led to an ambitious plan hatched with Peel Harvey Catchment Council to involve students from John Tonkin College in a pilot program to raise juvenile Bream for release into the Murray River as a way to support the ongoing survival and viability of the Black Bream fishery.

John Tonkin College transformed a classroom into an aquaculture laboratory designed by Aquaculture Lecturer Dr Ben Roennfeldt. Under the supervision of teachers Barbara Sing and Amanda Zele, students from the school's specialist "Surf Science" program helped construct the system where they grew algae, raised rotifers and artemia (zooplankton) for food. December 2019 saw a combined 2300 juveniles released into the Murray River.

Although the challenges in this pilot project have been many including; changing and modifying ideas and equipment, water parameters, relocation twice within the school, flooding a room, the massive time commitment outside class time and of course COVID the positives have far outweighed them. The experiential learning by our students has given

them the opportunity to be involved in real world science applications raised their and awareness about the fragility of our local ecosystem.

Our students have been keen to raise awareness about the health of the Black Bream habitat through the Peel Bright Minds Video, Kids Teaching Kids, visiting Primary Schools and working on a VR experience for those unable to attend our school to view the project.

10.40 am to 11.20 am
MORNING TEA

SESSION 2

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

PLENARY PRESENTATIONS 2

11.20 am

Voicing Wetlands: Celebrating Living Relationships of Love and Care

Adjunct Professor Anne Poelina¹, Professor Len Collard², *Professor Pierre Horwitz³,
Professor Laurie Guimond⁴ and Associate Professor Sandra Wooltorton¹

¹Nulungu Research Institute, University of Notre Dame, Broome

²School of Indigenous Studies, University of Western Australia, Dalkeith

³School of Science, Edith Cowan University, Joondalup

⁴School of Geography, University of Quebec a Montreal

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When all of us work together – scientists, social scientists, poets, story tellers, artists, film makers, dancers, philosophers, musicians, educators, activists and anthropologists – big transformation can happen.

To show such authentic collaboration, we describe a project called: ‘Voicing Rivers’, which brings together Indigenous and non-Indigenous researchers from multiple disciplines and local action-oriented groups, who connect with rivers. The project aim is to illustrate the relational interdependence among humans, river systems and waterways, showing that land, water and all beings intrinsically entwine in complex and intricate situated ways.

In this presentation we briefly describe international river research contexts, before focusing on two Western Australian river systems and their wetlands. One WA narrative features the social ecosystem now known as the Martuwarra Fitzroy River, while the other highlights the social ecosystem now referred to as the Swan River. Both living beings are relations with whom we have existed for millennia. Both have also been shaped by the forces of colonialism and pastoralism, one now also subject to industrialisation. We celebrate the integrity and authenticity of rivers as living beings.

We show that rivers are living, culturally and socially engaged beings. They hold stories, memories, histories, health or illness, emotions, ecosystem complexity and animate spirits. We illustrate how thriving rivers and wetlands honor close human relationships informed by an ethic of care, love and interdependence. Human cultural and historic identities are part of this story. We show that ecological crises are crises of relationship: and that collaborating with rivers and wetlands can ‘wake up the snake’ – awaken their sleeping spirits through

raising people's consciousness and actions. This is a story of healing, celebration, care and love. It's beginning to sweep the world, and calls people to reconnect with rivers, wetlands and each other.

11.40 am

**Wetland Challenges and Opportunities in the Lake Muir-Unicup
and Upper Kent catchments**

*Geoff Evans and Basil Schur

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The Lake Muir Unicup Wetland System is designated a Ramsar wetland of international significance. These wetlands face significant challenges from introduced feral animals, climate change, fire and other threats. Close to the Lake Muir wetlands is a suite of special lakes and swamps in the Upper Kent River catchment. Under the Gondwana Link banner, community groups including BirdLife WA and the Denmark Environment Centre, are progressing new opportunities for wetland conservation and protection. One exciting new opportunity is the Tootanellup Eco Restoration project being facilitated by Green Skills. The renewed focus on twenty-four woodlands, wetlands, swamplands and bushland properties, originally acquired by the Water and Rivers Commission for catchment rehabilitation and including Boggy Lake. These wetlands are emerging as an important focus for Australasian Bittern conservation in the South West with active conservation projects underway. Three short videos: Lake Muir Unicup Wetlands System; Tootanellup Eco Restoration project; Boggy Lake and Upper Kent River catchment areas will be shown, and, a final good news wetlands story.

12.00 noon

Partnering to Protect our Waterways

*Bonnie Beal Richardson¹, Robyn Bickell², Kirstin Field³, Natalie Goddard⁴, Charlie Jones⁵, Sally Kirby⁶, Sharon Meredith⁷, Krista Nicholson⁸, Ash Ramm⁹ and Barb Sing¹⁰

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Mandurah is home to approximately 80 year-round resident dolphins. These dolphins are an important aspect of Mandurah's identity. In August 2019, a sixteen-month old dolphin, Luca, died after becoming entangled in fishing line for the third time in six months. Luca's death sparked an incredible community response, drawing widespread attention to the impact of discarded fishing line and other waste on our marine wildlife.

The Clean Waterways Campaign was developed as a collective response to Luca's death, and the larger issue of waste in our waterways. It brings together existing research partnerships and community groups, along with government and local business to jointly develop new ways to engage the local community in caring for our waterways and the wildlife that relies on them.

POSTER PRESENTATIONS 2

12.20 pm

Diatoms and algal blooms: evaluating the success of an additive designed to control noxious blue-green algal blooms in urban wetlands

Syngeon Rodman and *Jess Delaney

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Many wetlands in the Perth metropolitan area are prone to noxious Cyanophyta (blue-green algae) blooms which are often caused by anthropogenic activities, such as altered hydrological regimes and increased nutrient loads. These blooms adversely affect aquatic ecosystems through reductions in dissolved oxygen levels which can ultimately lead to increased fish and macroinvertebrate mortality. Cyanophyta blooms also lead to public concern due to aesthetic issues and pungent odours. Some species also release toxins that can kill livestock and pets and cause illness in people.

The Town of Victoria Park and the City of Belmont have commenced treating two lakes prone to algal blooms (GO Edwards Lake and Tomato Lake, respectively) with a micronutrient additive designed to promote diatom growth. The premise of the product is that the increase in density and richness of diatoms effectively reduces nutrient availability (particularly nitrate) for nuisance algal growth. To gauge the effectiveness of this application, Biologic was engaged to undertake a pilot study of the phytoplankton and diatom assemblages present in each lake before and after the first spring-time application of the product in 2019. The study included sampling of water quality, *Chlorophyll a*, phytoplankton, and diatoms at three sites within each lake.

Both lakes recorded a significant increase in diatom taxa richness and diversity between sampling events. This indicates that the additive promoted diatom growth as intended. The collection of a diatom species known to be indicative of good water quality provided further evidence supporting the success of the additive. *Synedra ulna*, a species associated with unpolluted reference sites in Perth, was only recorded from GO Edwards Lake following application. Its absence from, or low population in the lake prior to treatment suggests an improvement in water quality between sampling events; an improvement which led to

positive changes to the diatom assemblage. Phytoplankton richness also increased post-application at both lakes, and dominance by a small number of taxa was no longer evident. In addition, the abundance of the bloom causing Cynophyta, *Nodularia*, also decreased following application at GO Edwards Lake. Phytoplankton and diatom assemblages in degraded wetlands commonly consist of high abundances of a few pollution resistant taxa (such as *Nodularia*), the increase in diversity and evenness between sampling events indicate improved ecosystem health.

Promising improvements in water quality were also recorded in both lakes following application. At GO Edwards Lake, concentrations of *Chlorophyll a* reduced significantly between sampling events, suggesting a reduction in photosynthesis. Both nitrate (N_NO3) and nitrogen oxide (N_NOx) concentrations also underwent a significant reduction following application, although nitrate concentrations were still in excess of ANZG (2018) default toxicity guideline values. Reduced concentrations of nitrogen ammonia (N_NH3) and total nitrogen were recorded at Tomato Lake following application, although total nitrogen concentrations were still in excess of ANZG (2018) default toxicity guideline values. Furthermore, dissolved oxygen concentrations at both lakes increased substantially between sampling events, although this increase was not significant.

While noticeable improvements in water quality and biotic assemblages were recorded after application, both lakes were still showing signs of eutrophication. This was more pronounced at Tomato Lake, where the toxic bloom causing Cyanophyta, *Microcystis*, persisted in high abundances. Both lakes also recorded diatom species indicative of nutrient enriched wetlands in both sampling events. This study was limited in that only one sampling event was undertaken post-application and it is anticipated that additional sampling and analysis would show further succession in phytoplankton and diatom assemblages. While results of this study are promising, further studies are needed to ascertain the long-term positive effects of the treatment.

12.25 pm

Saint Leonards Creek: What's in our backyards?

*Alison McGilvray¹, *Michelle Crow¹ and Melinda McAndrew²

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²City of Swan

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In the Swan Valley, private landholders are partnering with the Department of Biodiversity, Conservation and Attractions (DBCA) and the City of Swan (the City) to protect sections of Saint Leonards Creek. This project targets a new cohort in river and wetland restoration, providing practical assistance and encouraging landholders to value and protect what exists in their own backyards.

Saint Leonards Creek is a seasonal tributary to the Swan River, located in the suburbs of West Swan, Henley Brook and Brabham. Most of its catchment is in private ownership and has been used for rural and semi-rural purposes. West Swan and parts of Henley Brook are

in a protected area for the Swan Valley and not planned for residential development, while Brabham is undergoing substantial urbanisation.

Saint Leonards was identified as a catchment of concern by DBCA because of its high nutrient load entering the Swan River. DBCA and the City assessed the riparian vegetation and bank condition in 2018-2019. This restoration project is an outcome of the assessment.

Engagement with landholders along the creek has been ongoing through various forms. Letters were initially sent to 66 landholders seeking permission to assess the creek on their properties. Follow up phone calls were made, during which many people provided valuable insight about the creek, including changes over time and wildlife observations.

Many landholders wanted to protect the creek and its wildlife but were not aware which plants were weeds or natives, or what a natural creek ecosystem would look like. Several landholders run horses, with paddocks intersecting the creek.

After the assessment, landholders were sent a thank you letter and information sheet, which included significant observations from the assessment and some actions landholders could do to protect the creek.

Where urbanisation is not planned, landholders were offered the opportunity to restore their section of the creek with funding from DBCA. Of the 36 landholders who were eligible for funding, six took up the offer and have become actively engaged. Meetings were held with each landholder to discuss what they wanted to achieve and tailor the best approach to restoration. Each property is different and faces different challenges.

In the last two years, landholders, DBCA and the City of Swan have planted 6,099 plants and installed 2,780 tree guards to protect the seedlings from horses and kangaroos. A licensed contractor has removed most of the invasive woody and herbaceous weeds, with ongoing control needed to reduce competition and downstream spread. Two of the landholders have trialled solarisation using UV stabilised black plastic and dense planting, which have so far proven to be effective. One of the landholders has self-funded and erected exclusion fencing to keep her horses out of the creek. All the landowners have been actively involved in managing the revegetation area and have embraced the restoration of native plants and wildlife to their backyards.

12.30 pm

Soldiers Cove Water Wise Wetland

Dale Robinson

City of Mandurah

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Soldiers Cove Foreshore is located adjacent to the Peel-Harvey Estuary and within walking distance to the Mandurah Central Business District. The foreshore has experienced significant changes due to urbanisation and resulting challenges, at the site, which included road drainage outlets discharging directly into the estuary and a large onsite sewer infill pump station.

To reduce run-off and potential sewer pump station water from entering the estuary, a wetland was developed using water sensitive urban design principles. This included a bioretention swale, installation of wetland plants, soil amendments and limestone rock spoiling to assist with foreshore soil erosion.

The completion of this healthy, water-wise wetland has not only helped to improve water quality in the Peel-Harvey Estuary, but also increased the amenity of a very significant community foreshore. This project goal and outcome will continue to remain a key focus for the City of Mandurah's future water sensitive urban design projects.

12.35 pm

Update on Australian Government Wetland Management Activities

*Alex Tomlinson

Australian Government Department of Agriculture, Water and the Environment

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12.40 pm to 1.40 pm

LUNCH

SESSION 3

Chairperson: Bob Pond, Department of Water and Environmental Regulations

PLENARY PRESENTATIONS 3

1.40 pm

Community, Local Government and funding bodies working together to restore wetlands of the Derbarl Yerrigan

*Alex Devine¹ and *David Dyke²

¹City of Bayswater

²Friends of Malgamongup

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Wetland restoration is about combing community will, sound restoration methodology, contractor assistance and grant funding. This presentation will be provided by the land manager and the Community group. Malgamongup (Bardon Park) is a wetland within the City of Bayswater. The Reserve is located along the Swan Canning River Park and contains areas of remnant vegetation. Bardon Park has been identified as a significant ecological link providing both regional and local linkages along the Derbarl Yerrigan and through the City of Bayswater. The site has had a long history of disturbance with the majority of the site being classified as degraded.

In 2016 in response to the long history of neglect community member David Dyke formed the Friends of Bardon Park Wetland. This group put pressure on local members and the City of Bayswater to take action to prevent the site being completely degraded by invasive species including Lantana, Pepper, Blackberry and Pampas Grass. The site contains a diversity of habitats including foreshore, freshwater wetland and Spearwood dune complex

with natural springs. Bardon Park is the photo reference site for agave Americana for florabase and Western Weeds.

The City of Bayswater's Natural Area Officers prepared a conservation management plan to restore the site to a condition approaching what would have been onsite prior to European colonisation. For this undertaking reference sites were established with similar soil types and vegetation complexes.

Over the next 3 years the following occurred:

- The weeds were cleared in a systematic and staged approach
- 5 community planting events
- 3 successful grand applications
- 1 tender to run contractor works
- Monthly maintenance by the friends of Bardon Park
- Continuous communication with City of Bayswater officers.

The presentation will demonstrate how to implement a staged revegetation program over 3 years to ensure funds are not diluted over a large area. It will feature the importance of sound economic management, working in partnership with community and funding bodies. The presentation will endeavour to provide a step by process to ensure effective outcomes and how to avoid some of the pitfalls of restoration. The presentation will provide extensive photographic evidence of the progression of the restoration over 3 years.

2.00 pm

**The Lake Richmond Thrombolites: an assessment of thrombolite health
and their sensitivity to herbicides**

Rory Garven

City of Rockingham

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2.20 pm

Bindjareb Gabi Wonga – Bindjareb Water Story

*George Walley¹ and *Bronte Grant²

¹Mandjoogoordap Dreaming

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²Department of Water and Environmental Regulation

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We would like to share the Bring Together Walk Together partnership journey between Bindjareb Noongar Elders and the Department of Water and Environmental Regulation (DWER) for Bindjareb Noongar water perspectives.

This strong partnership was forged through a commitment to meaningful engagement with Traditional Owners in the development of the *Bindjareb Djilba Peel Harvey Estuary Protection Plan*, an election commitment of the McGowan government. The partnership has empowered Bindjareb Elders to develop their own overarching water plan, the *Bindjareb Gabi Wonga*, the Bindjareb Water Story, to look after their waterways. The Elders developed

their Yaakan (turtle) model for the plan based on cultural knowledge. Bindjareb Elders and DWER have shared and threaded knowledge systems to bring together cultural knowledge and western ways.

To communicate our co-designed approach to this partnership, George Walley and Bronte Grant have co-authored the *Bring Together, Walk Together Aboriginal Partnership Engagement Framework*. This framework communicates a pathway to forge, build and maintain strong partnerships for Aboriginal land water outcomes – a guide for water stakeholders to engage Traditional Owners in leading participatory research, policy and planning, major and minor projects.

Bindjareb Elders and the DWER continue to Bring Together Walk Together, through Healthy Estuaries WA (<https://estuaries.dwer.wa.gov.au/estuary/>) we are working towards the design and development of the Bindjareb Waterways Assessment Program in partnership with the Peel Harvey Catchment Council. This program will bring together cultural knowledge and western science and be a tool for Aboriginal people to look after special places. Along the way, we will develop an implementation plan for the Bindjareb Gabi Wonga to ‘put meat on the bones of the turtle’.

This story has recently been shared at the Danjoo Koorliny Social Impact Festival 2020 Kep Water Symposium and the Power to the People conference as a keynote presentation. Please find supporting materials (postcard, poster, brochure) at the link provided, including a short film that would be played as part of our presentation. https://wawatermy.sharepoint.com/:f/g/personal/bronte_grant_water_wa_gov_au/EmqOWCRntSZMgM8ij66Lt4IBdyb-h-EoPQh2eD-2E_DGFA?e=UyCiu8

Bindjareb Eldership Group

POSTER PRESENTATIONS 3

2.40 pm

Rehydration trials to identify resident flora and fauna from ephemeral wetlands and creeks

*Kim Nguyen, Syngeon Rodman and Jess Delaney

Biologic Environmental Survey

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A large proportion of Australia’s inland waters are temporary in nature and alternate between phases of inundation and drought. Due to the aridity of the Pilbara, such temporary systems are common. Rainfall associated with cyclonic events temporarily inundates wetlands and rivers, before eventually receding to residual pools. Historically, environmental value has primarily been attributed to permanent systems and pools in arid areas, despite the fact that temporary waters are known to hold considerable importance from a biodiversity perspective. Temporary waters support a unique assemblage of flora and fauna, including species specifically adapted to such environments, many of which require a period of desiccation in order to complete their life cycle and are therefore not found in permanent waters. Specialised adaptations to cope with seasonal drying include

aestivation and desiccation-resistant resting stages, where rainfall events trigger emergence of flora and fauna and subsequent colonisation.

The temporary nature of Pilbara waters poses a particularly relevant and important challenge given the intensity of resource development in the region. As part of the Environmental Approvals process, temporary systems require an assessment of potential impacts, where development may require dewatering or discharge operations and/or channel realignment. Such impacts can be difficult to quantify and monitor given the highly variable nature of temporary systems, and relatively short timeframe when surface water is present to mobilise and undertake a comprehensive aquatic ecosystem survey. One approach to overcome this issue is to undertake an assessment of the bank of propagules (seeds and eggs) present within dry sediments and the continued viability of this major recruitment pathway over time. This can be achieved through the collection of surficial sediments (top 3-5 cm) from dry creekbeds and subsequent inundation of these samples in the laboratory to simulate a wetting cycle. Such rehydration trials have been undertaken widely in ecological studies of temporary waters, and more recently, the approach has been used to assess the impacts of mining in salt lakes. However, the approach is relatively new in the Pilbara, with methodology and success still to be assessed.

This study aims to assess whether rehydration trials are applicable to Pilbara temporary waters, specifically whether this approach can be used (alone or to support broader aquatic ecosystem surveys) to assess impacts of proposed developments. Rehydration and emergence trials undertaken on 35 samples collected from temporary waters of the Pilbara, across five creeklines. Sediment samples were collected from the waterline in areas which appeared to have held water recently. Field conditions were simulated in aerated tanks in the laboratory, and heat lamps used to ensure water temperatures were representative of Pilbara ephemeral pools. Trials were conducted under a 12 hour light / 12 hour dark cycle for a period of 20 to 28 days, after which tanks were drained and a second wetting phase undertaken. Emergent fauna and macrophytes were observed every 24 to 48 hours and specimens were harvested at the completion of each wetting phase. Specimens were identified to the lowest level possible under high-power magnification microscopes.

The trials were productive, yielding a diverse range of both invertebrates and primary producers. As is typical of rehydration trials in other regions, Crustacea were the dominant emergent invertebrate group, specifically Ostracoda (seed shrimp) and Diplostraca (water fleas and clam shrimp). Rotifera were also well represented. Several submerged macrophyte (plant and algae) genera including *Vallisneria*, *Ruppia*, *Ammannia* and *Chara* also germinated during the trials. While most taxa collected were widely distributed and not conservation significant, the Pilbara endemic clam shrimp *Limnadopsis pilbarensis* was collected. This species is relatively uncommon and known only from temporary pools. Several species, including this clam shrimp, were not recorded during the aquatic ecosystem survey undertaken in conjunction with the rehydrate trials, thereby adding to the ecological knowledge of the ephemeral systems sampled. The rehydration trials were effective in characterising the ecological values of ephemeral wetlands and creeks in the Pilbara. This information is important for decision-making processes in environmental approvals for mining developments.

2.45 pm

Resident bottlenose dolphins occupying the Ramsar-listed Peel-Harvey Estuary and how they face risks from live stranding events and entanglements in fishing gear

*Krista Nicholson¹, Neil Loneragan¹, Hugh Finn² and Lars Bejder³

¹Murdoch University

²Curtin University

³University of Hawaii

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The Ramsar-listed Peel-Harvey Estuary in Western Australia is occupied by a resident community of approximately 85 Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) with many more visiting the system occasionally. The estuarine community is socially, spatially, and isotopically distinct from dolphin communities in adjacent coastal waters with its members spending their entire life in the Estuary. This study investigated the demographic structure, estimated population growth rate, and identified threats to the community's persistence. Dolphin photo-identification data and tissue samples were collected during boat-based surveys in the Peel-Harvey Estuary between 2016 and 2019. The estuarine community appeared to be closed to immigration with additions observed only through the birth process. The mean annual reproductive rate was 0.39 (SD 0.20). Overall, apparent survival rates varied among age classes with the lowest survival observed for yearlings (0.75, SD 0.18) and the highest for dependent calves > 1 year old (1.00, SD 0.00). Juveniles had lower survival rate (0.88, SD 0.03) than adults (0.95, SD 0.02). Although population sex ratios in dependent calves and juveniles were close to parity, there were approximately twice as many mature females than mature males in the community. This suggests likely emigration of males from the community. A population viability analysis estimated a decline in population abundance with a slightly negative stochastic population growth rate (-0.0024, SD 0.0621). Live strandings were identified as one of the main threats to members of the estuarine community with 60 incidents observed during this study. At least 21% of mortalities during this study were attributable to live strandings. Individual heterogeneity in space and resource use has also led to individuals being heterogeneous in terms of their susceptibility to threats. Individuals showing higher site fidelity to the rivers are likely more exposed to biotoxins, while individuals showing high site fidelity to the estuary entrance channels are more susceptible to fishing line entanglements and predation. Given the slightly negative population growth rate, management should aim for zero human caused (i.e. entanglements) and live stranding mortality in this dolphin population.

2.50 pm

CLOSING REMARKS

Mr Tom Perrigo, Chairperson

The Wetlands Centre Cockburn

2.55 pm to 3.15 pm
AFTERNOON TEA

3.15 pm to 4.15 pm
CONCURRENT WORKSHOP SESSION

Workshop 1 – Alcoa Mandurah Art Gallery
How can Ecotourism create enhanced appreciation of wetland environments?

Sebastian 'Base' Jones and Jamie Van Jones

Co-Directors

Salt and Bush Eco Tours

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W www.saltandbush.com.au

How can Ecotourism find a balance in creating appreciation for our wetland environments, while limiting the impacts of tourism on these fragile ecosystems? Hear from a local ecotourism operator how they are showcasing the Peel-Harvey Wetlands while trying to educate and protect them at the same time. This workshop will cover the ways in which wetlands are perceived by the general public and how science communication, education and eco-tourism can change these perceptions for the better. It will also cover the pro's and con's of tourism in wetlands, and the hurdles that can be faced when operating in fragile environments.

Workshop 2 – Dance Studio
Turtle Tracking in the City of Cockburn – Where to next?

Rafeena Boyle and Vicky Hartill

Environmental Education Officers

City of Cockburn

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To reduce mortality rates in Bibra Lake's native turtle population, in 2019 the City of Cockburn in partnership with Murdoch University, Parks & Wildlife Services, Native ARC and The Wetlands Centre, Cockburn launched the Turtle Trackers citizen science program to help protect nesting females, their nests and eggs during the peak of the nesting season.

Following two seasons, the program is sparking interest from nearby councils, land management groups and the broader community, but to roll the program out to other lakes some changes to its current structure will be needed.

In this workshop we will discuss the pros and cons of the 2019 & 2020 Turtle Tracker program, the challenges facing its roll out beyond Bibra Lake, and workshop different scenarios for future management of this program.

Workshop 3 – Fishtrap Theatre

Developing a biodiversity database for Reserve management

Judy Fisher

Director, Theme Leader, Adjunct Associate Professor

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Eryn Jackson

Senior Environmental Management Officer

City of Mandurah

Cory Kennedy

Environmental Management Officer

City of Mandurah

Assisted by Bonita Begley

City of Mandurah

The Department of Biodiversity, Conservation and Attractions (DBCA) is the custodian of the wetland mapping dataset for the Swan Coastal Plain of Western Australia. Mapping including boundaries, types and management categories for wetlands on the Swan Coastal Plain is publicly available by downloading the Geomorphic Wetlands Swan Coastal Plain dataset on Landgate's "Locate" mapping platform. A methodology for the evaluation of wetlands on the Swan Coastal Plain, Western Australia provides a single, consistent method on how to evaluate wetlands across the Swan Coastal Plain. The outcome of the evaluation process for each wetland is the identification of a wetland management category. Wetland evaluation is the process of assessing a wetland's values by considering information about its attributes (plants, animals, soil and water) and functions (the processes that support the attributes). This workshop will introduce attendees to the current mapping of wetlands on the Swan Coastal Plain and show how to apply the "Wetland Evaluation Methodology" to derive management categories of wetlands and where to find information to assist.

Workshop 4 – Boardwalk Theatre

Workshop 4: Migratory Shorebird Conservation – We can all play a role

Dr Vicki Stokes

WA Program Manager, BirdLife Australia

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Shorebirds are mostly associated with wetlands and are an important indicator of their health and productivity. They are a diverse group of elegant birds, some of which carry out the most amazing migrations in the natural world. Unfortunately, due to ongoing declines, they are one of the most threatened groups of birds globally. This workshop will introduce participants to tips for identifying different groups of shorebirds, the types of habitats used by shorebirds and how to identify important sites. Participants will have the opportunity to learn about and discuss threats to shorebirds and ideas for addressing the impacts of recreational disturbance.

ADDITIONAL DISPLAYS

(Re)connect with Nature and Learn Something New

Mandurah Environment & Heritage Group

Linda Thorpe

Secretary

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Mandurah Environment & Heritage Group Inc. is proud to launch its new Activity Program “(Re)connect with Nature and Learn Something New” at the 2021 WA Wetland Management Conference. This is a one-year program of free educational, inspirational and accessible activities for people of all ages and abilities to:

- Provide introductions to environmentally-friendly groups;
- Get people outside and active;
- Increase knowledge and appreciation for Mandurah’s natural assets;
- Improve physical and mental health;
- Provide opportunities for new skills and community connections.

Visit <https://mehg.org.au> to view the calendar of events and to book an activity. MEHG is grateful to its partners for helping to deliver these activities, many of whom are providing their services free of charge. New partnerships and activities welcome! Proudly supported by City of Mandurah Community Grants.

Sharon Meredith Photo and Video Display

Sharon Meredith

Sharon Meredith Photography

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I’m a photographer/director/ videographer and all-round story teller. A multi-faceted creative based in Mandurah, Western Australia. I love helping people and empowering people and organisations to tell their stories.

I have a passion for environmental and grassroots projects, trained in the arts, community development and environmental studies. My strength is bringing my skills together to design creative projects that communicate environmental and social causes in a positive and engaging manner. My speciality is developing creative content for digital applications such as websites and social media, along with online behaviour change campaigns.

I have worked with a range of clients and delivered varied projects for community groups and organisations, businesses, non-for-profits and local government.

When I get the opportunity to work on my own photographic projects I love to explore environmental themes and enjoy experimenting with different equipment and photographic techniques with my work, such as playing with projectors, long-exposures and are fascinated with photographing subjects in studio without the use of artificial lighting.

Ways To Nature

Sarah Way

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Sarah Way is a zoologist passionate about Australia's biodiversity and the owner of Mandurah-based ecotourism business Ways To Nature. Sarah has spent her career working on threatened species conservation programs and created Ways To Nature to engage and connect people with nature. Ways to Nature is dedicated to fostering an understanding of, and appreciation for, the unique flora and fauna of the Bindjareb (Peel) region. Sarah leads guided nature walks in the wetland reserves of the Peel-Yalgorup Ramsar site, offering engaging interpretation about wetland ecology and wildlife. Ways To Nature also delivers school holiday programs and mobile environmental presentations for community and school groups, inspiring a sense of wonder and appreciation of Australia's biodiversity.

NETWORKING LIST

Paul	Adair	Friends of Baigup Wetland
Sandy	Adams	Indigenous Managed Services
Janet	Allen	
Lauren	Andrews	City of Cockburn
Dr. Felicity	Bairstow	
Merrilee	Baker	Natures Heart Intentions
Kay	Barnard	Student
Plaxy	Barratt	
Claire	Bartron	City of Joondalup
Bonnie	BealRichardson	City of Mandurah
Ronda	Beck	
Klaus Peter	Becker	Bouvard Coast Care Group (BCCG)
Camilla	Bedulli	City of Cockburn
Jennie	Beeson	PHCC
Robyn	Bickell	Estuary Guardians
Sam	Bolton-Taylor	Indigenous Managed Services
Jo	Bower	Friends of Maylands Samphires
Rafeena	Boyle	City of Cockburn
Daniela	Buters	Community Conservation Volunteer
Melissa	Bywaters	City of Cockburn
Chloe	Cameron	Worsley Alumina Pty Ltd
Mitali	Chaudhari	The University of Western Australia
Elaine	Christy	The Wetlands Centre Cockburn
Chris	Christy	The Wetlands Centre Cockburn
Ruth	Clark	
Dylan	Clarke	Murdoch student
David	Clayton	City of Bayswater
Sue	Conlan	Friends of Mosman Park Bushland
Glenn	Cook	Friends of Eric Singleton Bird Sanctuary
Rebecca	Cooper	City of Bayswater
Dr Michael	Coote	DBCA
Diana	Corbyn	Diana Corbyn
Catherine	Cornes	Friends of Bardon Park
Sorcha	Cronin-O'Reilly	Murdoch University
Denise	Crosbie	The Wetlands Centre Cockburn
Michelle	Crow	Dept of Biodiversity, Conservation and Attractions
Melanie	Davies	WALGA
Jake	Daviot	Stantec
Tracy	de Vetter	Murdoch University
Anita	Dearle	Indigenous Managed Services
Jess	Delaney	Biologic
Robyn	Devenish	MEHG
Alex	Devine	City of Bayswater
Andy	Duke	Mandurah Resident
David	Dyke	Friends of Bardon Park
Mitch	Edwards	
Tom	England	City of Stirling
Fiona	Felton	DBCA
Prof. Judith	Fisher	Fisher Research Pty Ltd
Dr. Steve	Fisher	Peel-Harvey Catchment Council
Jesz	Flemming	Denmark Environment Centre & Denmark Bird Group
Julie	Fort	Friend of Maylands Samphires
Jim	Fyfe	Friends of Big Swamp
Wessey	Garlett	City of Cockburn
Rory	Garven	City of Rockingham
Zane	Gates	City of Bayswater
Adrian	Glamorgan	"Understorey" on RTYRFM 92.1
Natalie	Goddard	Mandurah Cruises
Bronte	Grant	Department of Water and Environmental Regulation
Mike	Griffiths	Peel-Harvey Catchment Council

Suzie	Gunn	
Georgia	Haines	City of Mandurah
Carolyn	Harding	DBCA
Adam	Harris	City of Cockburn
Tim	Heckler	Nexxial Ecology PL
Trudy	Hinkes	Indigenous Managed Services
Chris	Hofmeester	Stantec
Prof. Pierre	Horwitz	Edith Cowan University
Val	Humphrey	Friends of Bindaring Wetland Bassendean
Dianne	Hunter	Turtle Oblonga Rescue
Shane	Hunter	Armadale Gosnells Landcare Group
Pierre	Hyett	City of Cockburn
Eryn	Jackson	City of Mandurah
Karen	Jackson	DBCA
David	James	Friends of Forrestdale
Rick	James	PHCC
David	Jenkins	Peel MALA (Mature Adult Learning Association)
Emer. Prof. Philip	Jennings	Wetlands Conservation Society
Reece	Jerrett	Landcare SJ
Isabelle	Johansson	Biologic
Jeff	John	City of Rockingham
Kathryn	Johnson	EMRC
Linda	Johnson	Friends of Moore River Estuary
Charlie	Jones	Peel-Harvey Catchment Council
Jamie	Van Jones	Salt and Bush Eco Tours
Sam	Jones	City of Cockburn
Sebastian	Jones	Salt and Bush Eco Tours
Dr. Tod	Jones	Curtin University
Kirsi	Kauhanen	MBS Environmental
Cory	Kennedy	City of Mandurah
Matthew	Kennewell	City of Cockburn
Kerry	Kerr	Friends of Big Swamp
Sally	Kirby	Estuary Guardians and Peel Preservation Group
Caroline	Knight	Peel-Harvey Catchment Council
Jillian	Koerting	
Amy	Krupa	South East Regional Centre for Urban Landcare
Brett	Kuhlmann	Department of Biodiversity, Conservation and Attractions
Penny	Lee	
Tom	Lerner	Shire of Murray
Austin	Lilly	Indigenous Managed Services
Beverley	Lockley	Katanning Environmental Inc
Julie	MacMile	Peel-Harvey Catchment Council
Mish	Mann	TAFE student
Alison	McGilvray	Dept of Biodiversity, Conservation and Attractions
Sharon	Meredith	Sharon Meredith Photography
Linda	Metz	City of Cockburn
Daniel	Millea	City of Cockburn
Anton	Mittra	Biologic
Matt	Moore	City of Bayswater
Pauline	Morrow	Peel MALA (Mature Adult Learning Association)
Michelle	Mullarkey	-
Sarah	Muller	South East Regional Centre for Urban Landcare
Sharon	Munro	WESROC
Christina	Nardini	Peel Harvey Catchment Council
Kim	Nguyen	Biologic
Krista	Nicholson	Murdoch University
Muhammad	Nur Izzat	Murdoch University
Judith	Olsen	
Jane	O'Malley	Peel-Harvey Catchment Council
Marc	Papalia	City of Cockburn
Helen	Parsons	Peel Harvey Catchment Council
Ellie	Parvin	The Wetlands Centre Cockburn
Ezgi	Perincek	Department of Biodiversity Conservation and Attractions
Tom	Perrigo	The Wetlands Centre

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Elizabeth	PO'	"Understorey" on RTRFM 92.1
Sasha	Poli	City of Wanneroo
Bob	Pond	Department of Water and Environmental Regulation
Claire	Raphael	City of Rockingham
Mary Ann	Rath	
Elizabeth	Re	City of Stirling
Christine	Read	
Julie	Reynolds	
Johanna	Riddell	ECO
Dale	Robinson	City of Mandurah
Lisa	Robinson	Town of Claremont
Dr. Ben	Roennfeldt	Murdoch University
Margaret	Rogers	Volunteer
Tom	Rose	
Jesse	Rowley	Peel-Harvey Catchment Council
Emma	Saikovski	City of Rockingham
Rex	Sallur	The Wetlands Centre Cockburn
Angela	Sawiak	The Wetlands Centre
Barbara	Sing	John Tonkin College
Judy	Slehofer	Friends of Baigup Wetland
Francis	Smit	Landcare SJ Inc
Jeremy	Smith	City of Mandurah
Drew	Smoker	City of Cockburn
Dr. Ru	Somaweera	Stantec
Katelyn	Standley	City of Cockburn
James	Steber	The Wetlands Centre Cockburn
Dr. Vicki	Stokes	BirdLife Australia
Rory	Swiderski	South32
Linda	Thorpe	Mandurah Environment & Heritage Group Australian Department of Agriculture, Water and the Environment
Alex	Tomlinson	
Christine	Townsend	Peel Harvey Catchment Council
Mel	Tucker	WRM
Danielle	Tyrls	The Wetlands Centre Cockburn
Michael	Venarsky	Department of Biodiversity Conservation and Attractions
George	Walley	Mandjoogoordap Dreaming
Laurie	Walsh	
Danae	Warden	EMRC
Richard	Warren	Elard Pty Ltd
Gavin	Waugh	The Wetlands Centre Cockburn
Sarah	Way	Ways To Nature
Dan	West	City of Bayswater
Suparna	Whale	The Wetlands Centre Cockburn
Clare	Whyte	Biologic
Marilyn	Wickee	City of Mandurah
Amy	Williams	Peel Harvey Catchment Council
Marlene	Williams	
Zoe	Williamson	City of Melville
Karin	Wittwer	City of Mandurah
Alan	Wright	DBCA
Ross	Wylie	Armadale Gosnells Landcare Group
Amanda	Zeke	John Tonkin College
Sandy	Adams	Indigenous Managed Services
Janet	Allen	
Lauren	Andrews	City of Cockburn
Dr. Felicity	Bairstow	
Merrilee	Baker	Natures Heart Intentions
Kay	Barnard	Student
Plaxy	Barratt	
Claire	Bartron	City of Joondalup
Bonnie	BealRichardson	City of Mandurah
Ronda	Beck	
Klaus Peter	Becker	Bouvard Coast Care Group (BCCG)
Camilla	Bedulli	City of Cockburn

Jennie	Beeson	PHCC
Robyn	Bickell	Estuary Guardians
Sam	Bolton-Taylor	Indigenous Managed Services
Jo	Bower	Friends of Maylands Samphires
Rafeena	Boyle	City of Cockburn
Daniela	Buters	Community Conservation Volunteer
Melissa	Bywaters	City of Cockburn
Chloe	Cameron	Worsley Alumina Pty Ltd
Mitali	Chaudhari	The University of Western Australia
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Chris	Christy	The Wetlands Centre Cockburn
Ruth	Clark	
Dylan	Clarke	Murdoch student
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Sue	Conlan	Friends of Mosman Park Bushland
Glenn	Cook	Friends of Eric Singleton Bird Sanctuary
Rebecca	Cooper	City of Bayswater
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Diana	Corbyn	Diana Corbyn
Catherine	Cornes	Friends of Bardon Park
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Jake	Daviot	Stantec
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Jess	Delaney	Biologic
Robyn	Devenish	MEHG
Alex	Devine	City of Bayswater
Andy	Duke	Mandurah Resident
David	Dyke	Friends of Bardon Park
Mitch	Edwards	
Tom	England	City of Stirling
Fiona	Felton	DBCA
Prof. Judith	Fisher	Fisher Research Pty Ltd
Dr. Steve	Fisher	Peel-Harvey Catchment Council
Jesz	Flemming	
Jesz	Flemming	Denmark Environment Centre & Denmark Bird Group
Julie	Fort	Friend of Maylands Samphires
Jim	Fyfe	Friends of Big Swamp
Wessey	Garlett	City of Cockburn
Rory	Garven	City of Rockingham
Zane	Gates	City of Bayswater
Adrian	Glamorgan	"Understorey" on RTYRFM 92.1
Natalie	Goddard	Mandurah Cruises
Bronte	Grant	Department of Water and Environmental Regulation
Mike	Griffiths	Peel-Harvey Catchment Council
Suzie	Gunn	
Georgia	Haines	City of Mandurah
Carolyn	Harding	DBCA
Adam	Harris	City of Cockburn
Tim	Heckler	Nexxial Ecology PL
Trudy	Hinkes	Indigenous Managed Services
Chris	Hofmeester	Stantec
Prof. Pierre	Horwitz	Edith Cowan University
Val	Humphrey	Friends of Bindaring Wetland Bassendean
Dianne	Hunter	Turtle Oblonga Rescue
Shane	Hunter	Armadale Gosnells Landcare Group
Pierre	Hyett	City of Cockburn
Eryn	Jackson	City of Mandurah
Karen	Jackson	DBCA
David	James	Friends of Forrestdale
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Jeff	John	City of Rockingham
Kathryn	Johnson	EMRC
Linda	Johnson	Friends of Moore River Estuary
Charlie	Jones	Peel-Harvey Catchment Council
Jamie	Van Jones	Salt and Bush Eco Tours
Sam	Jones	City of Cockburn
Sebastian	Jones	Salt and Bush Eco Tours
Dr. Tod	Jones	Curtin University
Kirsi	Kauhanen	MBS Environmental
Cory	Kennedy	City of Mandurah
Matthew	Kennewell	City of Cockburn
Kerry	Kerr	Friends of Big Swamp
Sally	Kirby	Estuary Guardians and Peel Preservation Group
Caroline	Knight	Peel-Harvey Catchment Council
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Amy	Krupa	South East Regional Centre for Urban Landcare
Brett	Kuhlmann	Department of Biodiversity, Conservation and Attractions
Penny	Lee	
Tom	Lerner	Shire of Murray
Austin	Lilly	Indigenous Managed Services
Beverley	Lockley	Katanning Environmental Inc
Julie	MacMile	Peel-Harvey Catchment Council
Mish	Mann	TAFE student
Alison	McGilvray	Dept of Biodiversity, Conservation and Attractions
Sharon	Meredith	Sharon Meredith Photography
Linda	Metz	City of Cockburn
Daniel	Millea	City of Cockburn
Anton	Mittra	Biologic
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Karin	Wittwer	City of Mandurah
Alan	Wright	DBCA
Ross	Wylie	Armadale Gosnells Landcare Group
Amanda	Zelev	John Tonkin College

.....and the students of John Tonkin College!

MANDURAH PERFORMING ARTS CENTRE SITE PLAN

