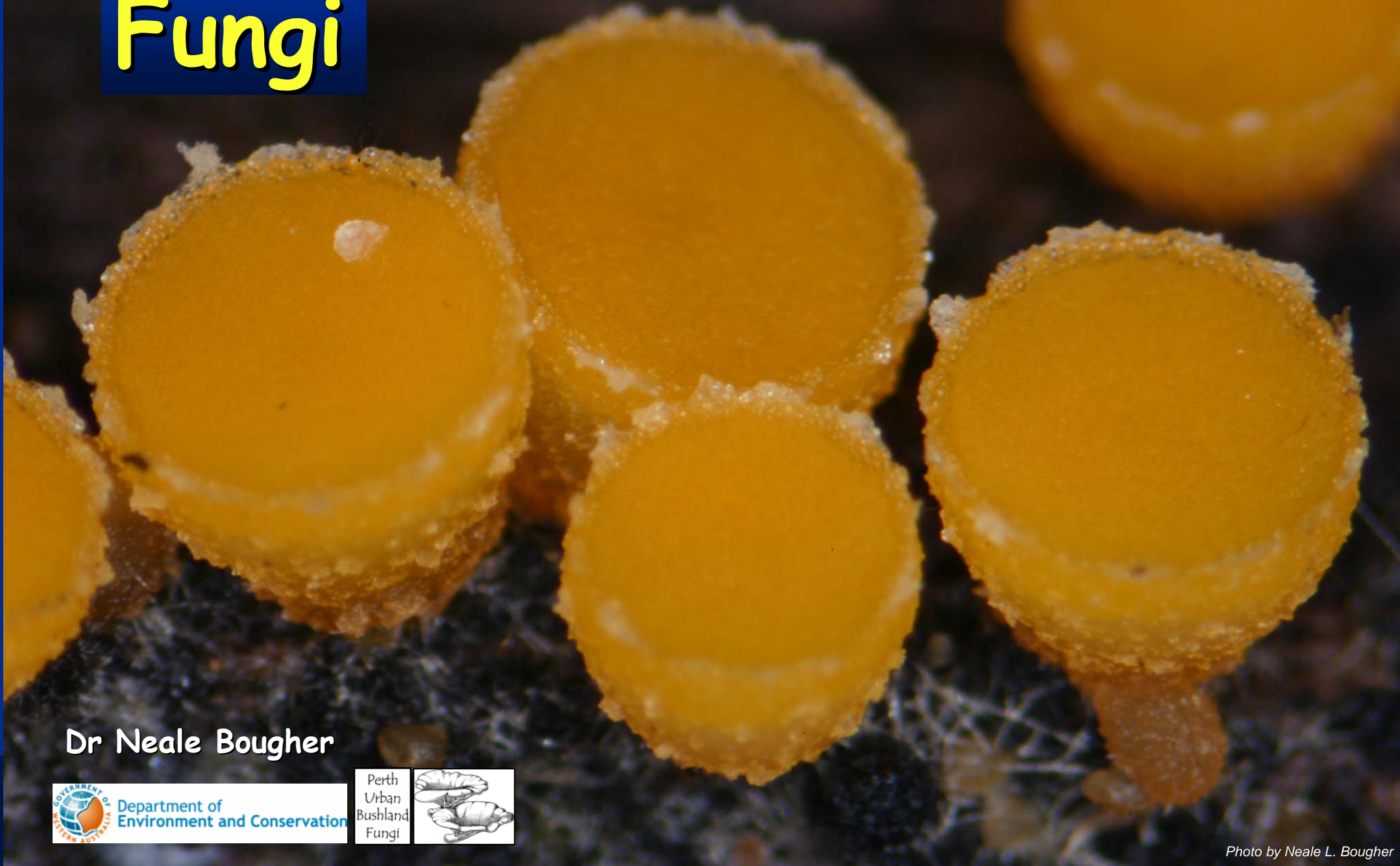


# Fungi



Dr Neale Bougher



Department of  
Environment and Conservation

Perth  
Urban  
Bushland  
Fungi



# 3F's Conservation and Management

## FLORA FAUNA & FUNGI

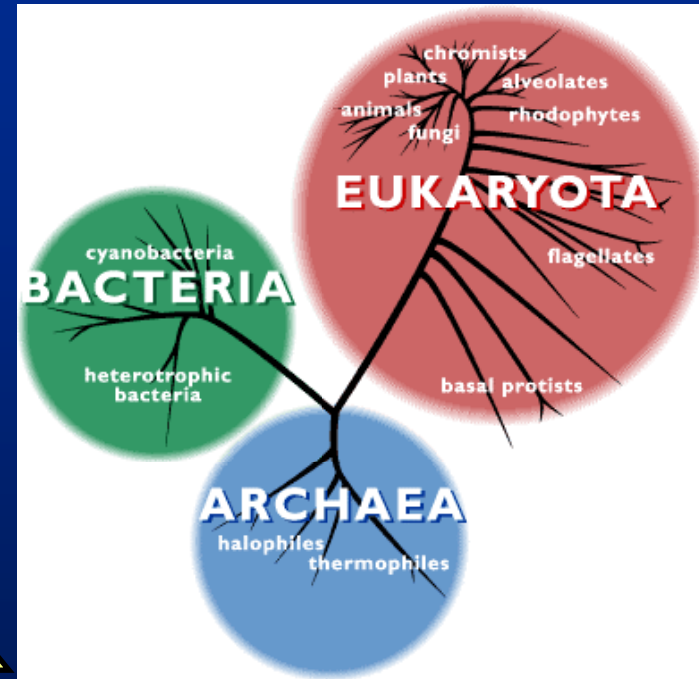
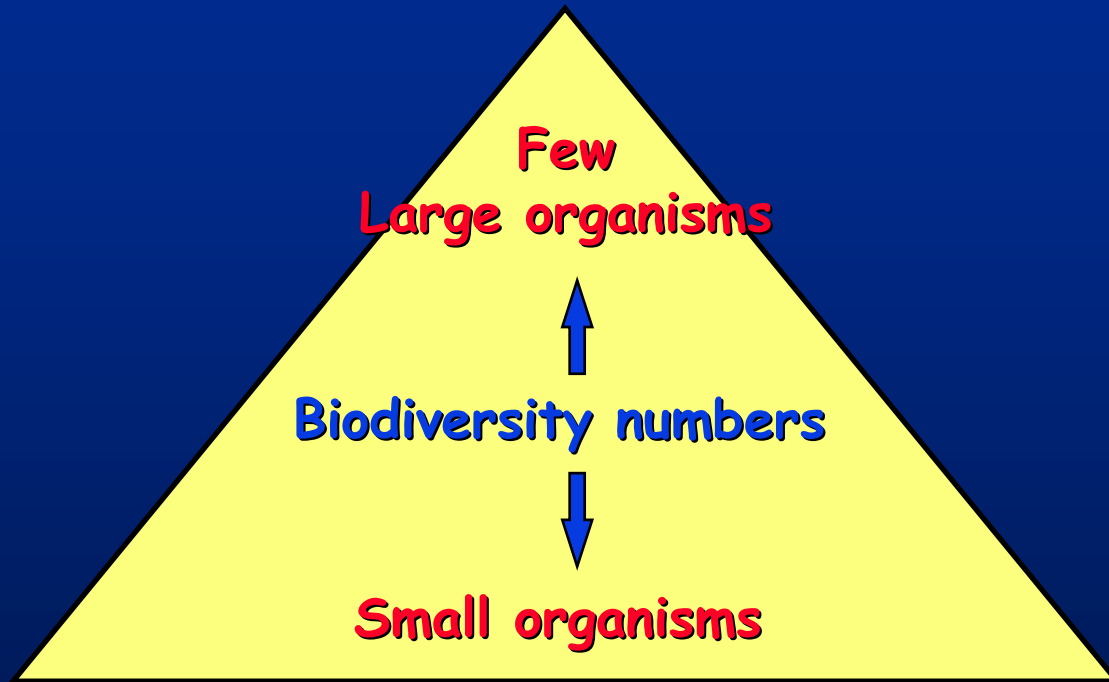
- **Why Fungi?**

- ✓ **Biodiversity:** numbers far outweigh plants
- ✓ **Functions:** healthy bush = many fungi
- ✓ **Sensitive to change:** indicators for monitoring
- ✓ **Public profile:** community participation & education - PUBF

- **Fungi in Wungong**

Dr Neale Bougher

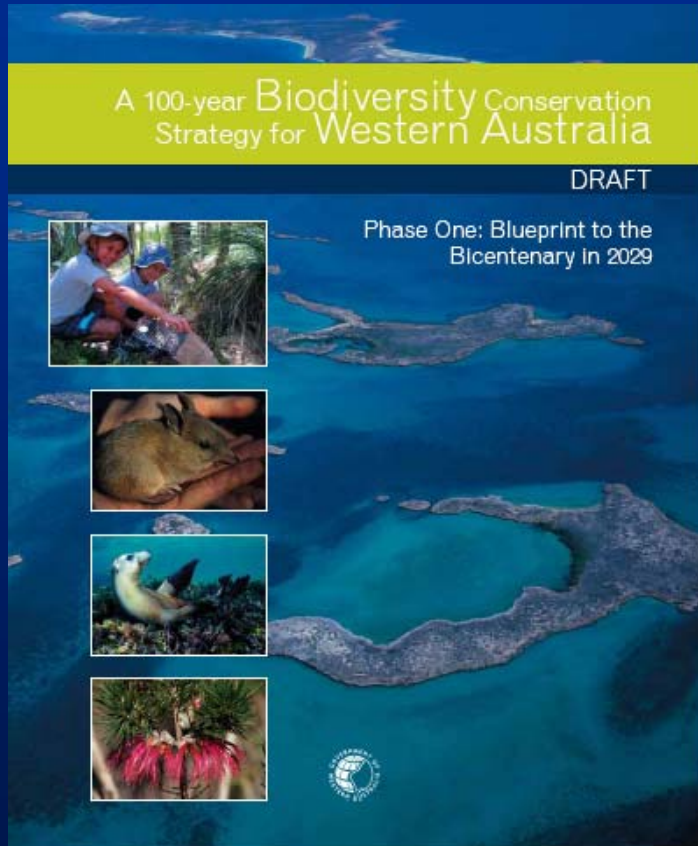
# Fungi



Fungi are not mysterious plants  
Own Kingdom - *closer to animals than plants*

# Fungi Biodiversity

Fungi: Wungong Research Seminar 29<sup>th</sup> May 2007 Neale Bougher, DEC



Many times more fungi than plants



## APPENDIX 1: Summary of WA taxa and level of endemism

	Approximate number of described taxa in WA	Estimated total number of taxa in WA	% described taxa that are endemic to WA
<b>ANIMALS</b>			
<b>PLANTS</b>			
Vascular	11,500	14,000	Northern – 14% Eremaean – 50% South-West – 79% Whole of WA – 62% Non-vascular
Algae (freshwater and marine)	2633	9000	Freshwater - approximately 50% Marine – low, many species shared with other temperate or tropical areas
Mosses	353	400	unknown
<b>FUNGI</b>			
Lichens	621	700	Unknown for whole kingdom but 10.6% for basidiomycete macrofungi approximately 10%

# Function: Fungi crucial for healthy bushlands

" Fungal networks bind soil, plants and animals into a healthy cohesive system "

## NUTRIENT CYCLING & SOIL HEALTH

- decompose leaf litter & woody debris
- bind & improve soil organic & structure
- transport nutrients in soil



## PARTNERSHIPS

- food for most plants (mycorrhiza)
- food for many animals

Fruit body



Mycelium



Woylies,  
Bandicoots ...



Springtails ...

# Healthy Bush = Many Fungi



## Healthy bush

- 100's of native fungi per hectare.
- Healthy ecosystem processes.



## Degraded Bush

- Fewer fungi.
- Poor ecosystem processes.



## Farmland/Housing

- Few or no fungi !
- Fertility artificially supported.

# Fungi are sensitive indicators of changes

Fungi susceptible as they are mostly in upper soil

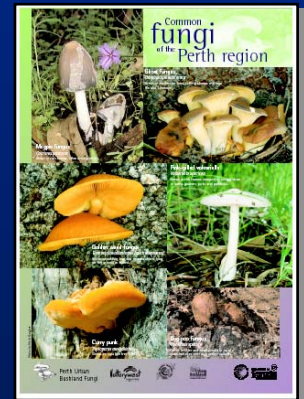
- Fire
- Log/ stump removal
- Soil & litter compaction, erosion
- Loss of native plants & animals



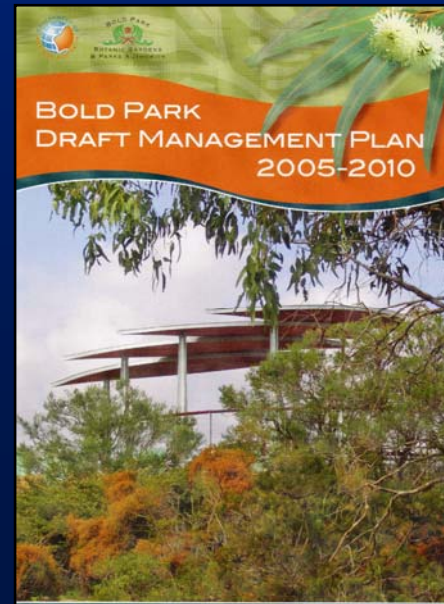
Fire responsive fungus

# Fungi Public Profile Increasing

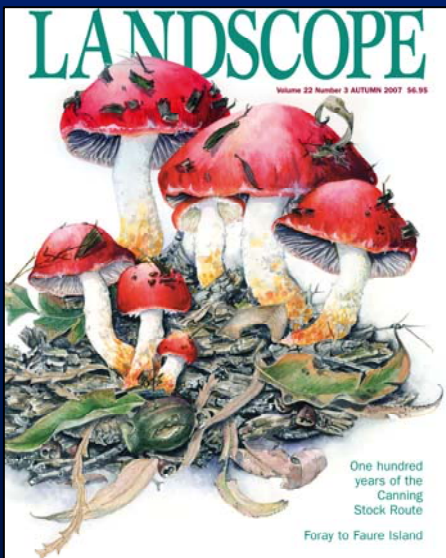
- Heightened requirement for 3F conservation & management
- Legislative, Corporate, Community
- Demand for information increasing
- Community, local govt. undertaking fungi surveys
- **PUBF**



3Fs in management plans



Signage in bushlands



Attractive fungi



# Perth Urban Bushland Fungi Project



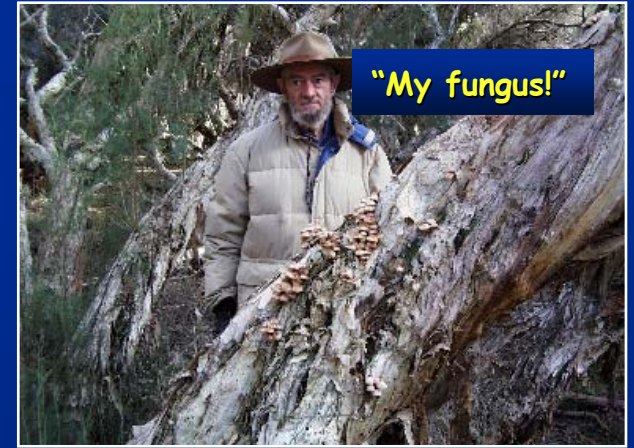
Community ↔ Science



- Raise awareness about fungi and their roles
- Increase community skills - surveys & IDs
- Build baseline scientific data, including a permanent ref collection
- Encourage integration in management of biodiversity & bushlands

# PUBF Community

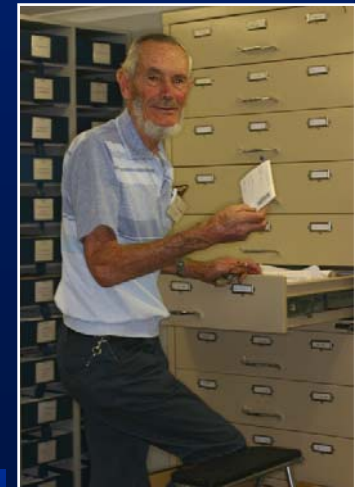
- Over 3,000 participants
- Over 50 field Events
- Trained Fungi Leaders
- Numerous courses & talks
- Raised awareness & knowledge
- Volunteer fungi workforce



Children love fungi



UWA Extension Course



# PUBF Georeferencing System

for collecting, storing and retrieving fungi data

Fungi: Wungong Research Seminar 29<sup>th</sup> May 2007 Neale Boughner, DEC



GPS track  
recorded for  
each group of  
people



Georeferenced  
photographs  
taken of each  
specimen



# Fungi Photos and Data linked to Mapped Track

Fungi: Wungqong Research Seminar 29<sup>th</sup> May 2007 Neale Bougher, DEC



## *Ramaria gracilis* -Coral Fungus

Photographer, Louise Little  
In Jarrah, Sheoak, *Banksia* woodland, in  
litter beneath Jarrah  
Latitude: -31° 52' 51.35" Longitude:  
115° 51' 27.85"  
Date: 24 Jul 2004  
Image CW16\_28LL7815



## *Dacrymyces sp.* -Jelly fungus

Photographer, Louise Little  
On Dead *Banksia* wood  
Latitude: -31° 52' 50.95" Longitude:  
115° 51' 27.50"  
Date: 24 Jul 2004  
Image CW16\_28LL7817



## *Pycnoporus coccineus* -Scarlet Bracket Fungus

Photographer Louise Little  
On Dead *Banksia* wood  
Latitude: -31° 52' 50.66" Longitude:  
115° 51' 27.08"  
Date: 24 Jul 2004  
Image CW16\_28LL7820

# PUBF Feedback Packages to Community Groups

Inventory of Fungi. Map with sampling route.

Fungi & people photos. Recommendations for management.

	18 <i>Gymnopus cf. purpuratus</i> Photographer Louise Little Specimen ID: 2339 Growing on dead wood in melaleuca woodland. Latitude: -32° 13' 35.87" Longitude: 115° 54' 8.20" Easting: 596567 Northing: 6413915 Zone: 50 Date: 09 Jul 2006 opt Image: MD62_162LL18
	19 <i>Phaeoaria communis</i> Common Phaeoaria Photographer Louise Little Specimen ID: 2340 Growing in sand in melaleuca woodland. Latitude: -32° 13' 35.87" Longitude: 115° 54' 8.11" Easting: 596564 Northing: 6413915 Zone: 50 Date: 09 Jul 2006 opt Image: MD62_162LL19
	22 <i>Inermisla fulvipes</i> Photographer Louise Little Specimen ID: 2342 Growing in sand in melaleuca woodland. Latitude: -32° 13' 35.87" Longitude: 115° 54' 8.11" Easting: 596564 Northing: 6413915 Zone: 50 Date: 09 Jul 2006 opt Image: MD62_162LL22 Vouchered into WA Herbarium EX560

## Perth Urban Bushland Fungi Project Fungi Reports 2006



### Introduction

Fungi Survey Reports in this Volume (each report also published individually)

- Koondoola Regional Park
- Whiteman Park Bushland
- Trigg Bushland
- Modong Nature Reserve
- Maida Vale Reserve
- Queens Park Bushland

### Written and produced by

**Neale L. Bougher, Roz Hart and Sarah de Bueger**

Department of Environment and Conservation – Perth Urban Bushland Fungi Project

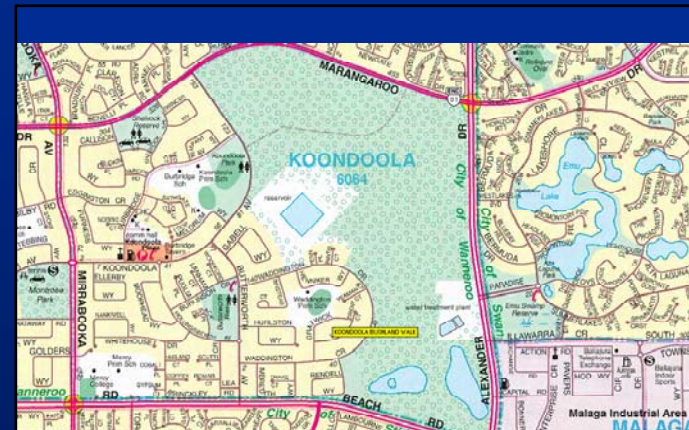
Photos and field assistance by PUBF Leaders and participants

© October 2006

Other 2006 PUBF Fungi Survey Reports (published separately to this volume)

- Lowlands Bushland
- Workshops for Local Government Officers (each report published individually)
  - North Lake Bushland
  - Whiteman Park Bushland
- Regional Parks Surveys (each report also published individually)
  - Brownman Swamp Bushland in Beeliar Regional Park
  - Paganoni Bushland in Rockingham Lakes Regional Park
  - Yellagonga Regional Park
- WA Naturalists' Club Fungi weekend, Roleystone

For further information about the Perth Urban Bushland Fungi Project, see the project website at  
[www.fungiperth.org.au](http://www.fungiperth.org.au)



StreetExpress Map showing the location of Koondoola Regional Bushland, Bush Forever Site 201. Koondoola Regional Bushland is a Department of Environment and Conservation Reference Site.



Aerial photo showing the colour coded tracks walked by the five groups on 10 June 2006.

# PUBF Science

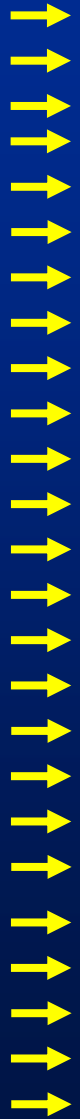
- Recorded about 3,000 fungi from 38 bushlands.
- Foundation inventories for 24 bushlands
- New records for Australia & WA
- New species to Science
- Fungi types: rare, weed, gondwanan ...
- Permanent ref vouchers & dataset: bolstered at WA Herbarium
- Data in Swan Bioplan icon bushland ref files



# Fungi Data Matrix for Perth Region

Fungi: Wungong Research Seminar 29<sup>th</sup> May 2007 Neale Boughner, DEC

Fungi species	Bushlands																																									
	Sum	Allan Park	Baldvins	Bold Park	Brownman Swamp Reg_ Pk	Cadogan	Cottonwood	Forrestdale Lake	Hartfiel Park	Jandakot Reg_ Pk	Joondalup	Ken Hurst	Kensington	Kings Park	Koondoola	Ledger Rd	Lowlands	Maida Vale	Mindarie Foreshore	Modong Bushland	North Lake	Paganoni	Paloma	Periwinkle	Queens Park	Quinns Rock	Rockingham Lakes Reg_ Pk	Roleystone	Samson Park	Shenton Bushland	Star Swamp	Talbot Road	Trigg	UWA	Warwick	Whiteman Park	Woodman Point Reg_ Pk	Yanchep	Yellagonga Reg_ Pk			
Agaricus austrovinaceus	1																																									
Agaricus sp.	10			1			1														1	3		1								2							1			
Agrocybe pediades	3			2															1																							
Aleurina ferruginea	7		2	1															1																							
Aleurina sp.	1																												1													
Aleurodiscus sp.	5																1					3															1					
Amanita basiorubra	1																																							1		
Amanita eucalypti	2																											1											1			
Amanita preissii cf. robusta	1																						1																			
Amanita sp.	51			3				2	1			3		6	1	12	1			1	1	3					4	2	1				1	1	1	4	3	1				
Amanita umbrinella	5													1	1													2												1		
Amanita xanthocephala	15			1												1					1	2					4	2				1	2	2				1			1	
Anthracoerythron archeri	3																										3															
Antrodia citra	1																										1															
Arcyria obvelata	2																										1												1			
Arcyria sp.	4															2															1								1			
Armillaria luteobubalina	8																					4					2			1			1									
Artomyces sp.	1			1																																						
Ascobolus sp.	1			1																																						
Asterostroma persimile	2			2																																						
Austrogautieria manjimupana	1				1																																					
Austropaxillus infundibuliform	7								1										1									2										3				
Austropeziza sp.	3							2	1																																	
Badhamia aff. viridescens	1																																									
Badhamia foliicola	1																																									1
Banksiomyces sp.	1											1																														
Bisporella sp.	4			2																								1											1			
Bjerkandera adusta	2																																									
Bolbitius vitellinus	11	3		1										1					1																							
Boletellus obscurecoccineus	6							2									1																									
Boletus sinape cruentus	1																																									
Boletus sp.	4																						1	1																		
Botryobasidium cf. subcoronatum	1																																									
Bovista sp.	5		1					1	2														1																			
Byssomerulius corium	8																1			1							1	1										1	2			
Calocera guepinioides	33		1	2				2	1		3																															
Calocera sp.	1																																									
Campanella cf. olivaceonigra	1			1																																						
Campanella gregaria	1																1																									



# Web Site - launched by Minister in 2005

www.fungiperth.org.au



Perth Urban Bushland Fungi Website - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address http://www.fungiperth.org.au/ Go Links

Canon Easy-WebPrint Print High Speed Print Preview Options

Search X

New Next Custom

Choose a category for your search:

- Find a **Web page**
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## Perth Urban Bushland Fungi

Understanding and protecting our fabulous fungi

[Home](#) [News Item](#) [Field Book](#) [Site Map](#) [Events2005](#) [About PUBF](#) [Participation](#)

[Bushland Activities](#) [Fungi of the Month](#) [Learning about fungi](#) [About the Project](#) [Other Resources](#)


### Welcome to the PUBF Website

Understanding and protecting our fabulous fungi!

Raising awareness and improving knowledge of fungi for bushland management in the Perth Region, south-west Australia.

#### The Project

Perth Urban Bushland Fungi (PUBF) is a collaborative project between the Urban Bushland Council and the WA Naturalists' Club in conjunction with the Department of Conservation and Land Management, Western Australian Herbarium. The project began



#### The Fungi

Find all you need to know about fungi in the Perth Region - What to look for and how to find fungi. Why understanding and recognising fungi is important to protecting our remaining bushland. Why fungi can make a difference to the health of the bush and what you can do to make a difference!

Internet



# Perth Region Fungi Field Book

Self-managed format. Expanding.

Fungi: Wungong Research Seminar 29<sup>th</sup> May 2007 Neale Boughner, DEC

## Perth Urban Bushland Fungi

Perth Urban Bushland Fungi  
Author: Neale L. Boughner  
Design: John R. Weaver  
For support:  
Mobile: 0427 200841  
Email: pubf@inet.net.au  
http://www.fungiperth.org.au

### A Self-Managed Field Book

#### Available Free:

From the PUBF website at:  
<http://www.fungiperth.org.au>  
Navigate to 'fieldbook';  
inspect the catalogue; download  
individual pages or the entire book in  
one, simple to use, PDF.

#### Check out what's Inside!

**Contents**

Assignment questions  
Perth Urban Bushland Fungi Fieldbook  
When to see Fungi in the Perth Region  
Fungi Conservation  
Visual Index: Ascomycetes  
Visual Index: Basidiomycetes  
Visual Index: slime moulds  
**Ascomycetes**  
Cup and Disk Fungi  
Bowl, Trough & Mound  
Puffball & Mushroom Fungi  
Marxian Ascomycetes  
Truffle Fungi  
**Basidiomycetes**  
Truffle Fungi  
Mushrooms & Toadstools with Gills  
Solitary Mushrooms  
Roadside with Pines  
Puffballs, earthballs, strobilata  
Carnivorous & Parasitic  
Coral & Club Fungi  
Stink & Shelf Fungi &  
Fungi growing with Pines  
Resupinate - Slat, Crust  
and Pin Fungi  
Truffle Fungi  
Inky & Fan Fungi  
Marxian Basidiomycetes  
**Slime Moulds**  
Cyanobacteria  
Cyanobacteria  
Chlorophyta



[www.fungiperth.org.au](http://www.fungiperth.org.au)

Basidiomycetes (Coral & Club Fungi)

M-2



#### Fairy Clubs *Macrotyphula juncea*

On wood twigs and leaves. Decomposer.

- Upright, slender, unbranched, bendable.
- Usually 15-50 mm tall x 1.5 mm wide.
- Stem slightly darker and thinner than fertile head.
- Spore print white.

#### Notes

© Perth Urban Bushland Fungi - Field Book / Last updated: 1/02/2007 Page M-2

Basidiomycetes (Mushrooms & Toadstools with Gills)

J-34



#### Archer's Cortinarius *Cortinarius archeri*

In litter. Mycorrhizal.

- Cap up to 100mm wide, violet.
- Cap and stem viscid when young.
- Stem with violet membrane-like veil, stained rusty due to spores.
- Spore print rusty brown.

#### Notes

© Perth Urban Bushland Fungi - Field Book / Last updated: 3/12/2006 Page J-34



[www.fungiperth.org.au](http://www.fungiperth.org.au)

# Fungi in Wungong Catchment

## Proposal



## Aims

Apply PUBF model & work in partnership with the community to:

1. Contribute scientific data for benchmarking and monitoring fungi biodiversity.
2. Foster public community participation and education.

## How?

- Surveys to supplement Forestcheck
- Public workshops



**3F's Conservation  
and Management**  
**FLORA FAUNA & FUNGI**