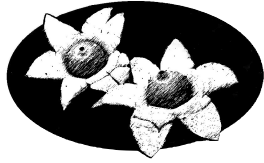


# THE QUEENSLAND MYCOLOGIST



Bulletin of  
The Queensland Mycological Society Inc  
Vol 9 Issue 4, Summer 2014



# The Queensland Mycological Society

ABN No 18 351 995 423

Internet: <http://qldfungi.org.au/>

Email: [info@qldfungi.org.au](mailto:info@qldfungi.org.au)

Address: [PO Box 5305, Alexandra Hills, Qld 4161, Australia](mailto:info@qldfungi.org.au)

## Society Objectives

The objectives of the Queensland Mycological Society are to:

1. Provide a forum and a network for amateur and professional mycologists to share their common interest in macro-fungi;
2. Stimulate and support the study and research of Queensland macro-fungi through the collection, storage, analysis and dissemination of information about fungi through workshops and fungal forays;
3. Promote, at both the state and federal levels, the identification of Queensland's macrofungal biodiversity through documentation and publication of its macro-fungi;
4. Promote an understanding and appreciation of the roles macro-fungal biodiversity plays in the health of Queensland ecosystems; and
5. Promote the conservation of indigenous macro-fungi and their relevant ecosystems.

## Queensland Mycologist

The *Queensland Mycologist* is issued quarterly. Members are invited to submit short articles or photos to the editor for publication. Material can be in any word processor format, but not PDF. The deadline for contributions for the next issue is **15 February 2015**, but earlier submission is appreciated. Late submissions may be held over to the next edition, depending on space, the amount of editing required, and how much time the editor has. Photos should be submitted separately at full-size to allow flexibility in resizing and cropping to fit the space available while minimising loss of quality. Authors who have specific preferences regarding placement of photos should indicate in the text where they want them, bearing in mind that space and formatting limitations may mean that it is not always possible to comply. Material from published sources may be included if that complies with copyright laws and the author and source are properly acknowledged.

## Membership

Membership of QMS is \$25 per annum, due at the beginning of each calendar year, and is open to anyone with an interest in Queensland fungi. Membership is **not** restricted to people living in Queensland. Membership forms are available on the website, <http://qldfungi.org.au/>.

Could members please notify the membership secretary ([memsec@qldfungi.org.au](mailto:memsec@qldfungi.org.au)) of changes to their contact details, especially e-mail addresses.

**Cover photo:** One of the many photos Vanessa and Chris Ryan took in Tasmania. This is a group of *Mycena subgalericulata* on a tree near Russell Falls in Mt Field National Park. A very common little fungus in Tasmania, it does not seem have been recorded in Queensland. See Vanessa's reports starting on page 7. Photo © Vanessa and Chris Ryan.

## QMS Executive

### President

Frances Guard  
07 5494 3951  
[info@qldfungi.org.au](mailto:info@qldfungi.org.au)

### Vice President

Patrick Leonard  
07 5456 4135  
[patbrenda.leonard@bigpond.com](mailto:patbrenda.leonard@bigpond.com)

### Secretary

Ronda Warhurst  
[info@qldfungi.org.au](mailto:info@qldfungi.org.au)

### Treasurer

Leesa Baker

### Minutes Secretary

Ronda Warhurst

### Membership Secretary

Leesa Baker  
[memsec@qldfungi.org.au](mailto:memsec@qldfungi.org.au)

### Foray Coordinator

Frances Guard  
[info@qldfungi.org.au](mailto:info@qldfungi.org.au)

## Other office holders

### Collection Permit Holder

Patrick Leonard

### Webmaster

Dave Wood  
[webmaster@qldfungi.org.au](mailto:webmaster@qldfungi.org.au)

### Website Developer

Vanessa Ryan

### Librarian

Susan Nelles

### Newsletter Editor

David Holdom

## Contents

QMS Calendar	4
Editor's Comments	5
Bellthorpe – Sunshine Coast Hinterland's Hidden Treasure	5
A Fungal Crossword	6
The <i>Macrocybe crassa</i> in my garden	7
Two Weeks in Tasmania – a Holiday and So Much More	7
Some Tasmanian Fungi and Lichens	9
Fungal Conservation – First steps to a Queensland Red List	11
Annex 1 The Global Red List Initiative	14
Crossword answers	16

## QMS Activities

### Meetings

Meetings are held in the F.M. Bailey Room at the Queensland Herbarium, Mt Coot-tha, commencing at 7pm on the second Tuesday of the month from February (no January meeting), unless otherwise scheduled. Check the website for details and any changes. There will be 3-4 guest speakers invited during the year and other meetings will be informal. Suggestions from members for topics or names of potential speakers or talks will be welcome at any time. Please contact a member of the executive.

To assist those unable to attend meetings, notes on

the talks are included in the Queensland Mycologist wherever possible. However, the notes never do justice to the topic as they do not reflect the enthusiasm of the speaker or cover the discussion that follows. So remember, where possible it is better to attend the meetings, get the information first hand and participate in the invaluable information sharing opportunity.

**Supper.** Suppers are provided by volunteers. Check the website for details of the roster and if you are able to assist please contact the secretary.

### Forays

QMS hold regular forays during the first half of the year. The dates are normally the 4<sup>th</sup> Saturday of the month, but dates will vary and additional forays may also be held.

Field trip details may change as a result of drought or other unforeseen circumstances. Check the

website for changes.

Members are invited to suggest venues for additional forays. If you have any suggestions (and especially if you are willing to lead a foray), please contact Fran or another member of the executive.

### Workshops

QMS runs workshops in the second half of the year, when there is little field activity. QMS held a successful workshop on how to study spores as part of the identification process on September 27.

Members are invited to suggest topics for workshops.

Send your ideas to Fran or Ronda ([info@qldfungi.org.au](mailto:info@qldfungi.org.au)).

Details will be included in future newsletters and on the QMS website.

## QMS Calendar 2015

MONTH	MEETINGS	FORAYS/WORKSHOPS
<b>February</b>	<b>10<sup>th</sup></b> Speaker: _Tony Young: Toxic Fungi	<b>28<sup>th</sup></b> Cooloola: Leader Fran Guard
<b>March</b>	<b>10<sup>th</sup></b> Members: Kim Nguyen Edibility of Fungi Cooloola Foray Report: Fran Guard	<b>14<sup>th</sup></b> Laidley: Leader Fran Guard <b>27<sup>th</sup>-29<sup>th</sup></b> Bellthorpe Weekend: Leaders Glenda Walter, Pat Leonard, Fran Guard
<b>April</b>	<b>14<sup>th</sup></b> Members: Bellthorpe Foray Reports: Glenda Walter & Pat Leonard	<b>11<sup>th</sup></b> Cunninghams Gap: Ronda & Peter Warhurst  Girraween NP: John Dearnaley (to be confirmed after rain)
<b>May</b>	<b>12<sup>th</sup></b> Members: Foray Reports:	<b>23<sup>rd</sup></b> Chermside Hills: John Wrench
<b>June</b>	<b>9<sup>th</sup></b> Speaker: AGM Dave Wood Fungal Genomics	<b>13<sup>th</sup></b> Linda Garrett: Pat Leonard
<b>July</b>	<b>14<sup>th</sup></b> Members: Foray Reports & Fungimap report	<b>4<sup>th</sup></b> Murrumba Downs: Bev Miles, Susie Webster
<b>August</b>	<b>11<sup>th</sup></b> Bring your microscope evening. Diana Leemon will be there to give advice on microscope setup & maintenance Foray report: Murrumba Downs	<b>29<sup>th</sup></b> Workshop: Spore Prints and Pics Leader: Fran Guard
<b>September</b>	<b>8<sup>th</sup></b> Members' evening	-----
<b>October</b>	<b>13<sup>th</sup></b> Speaker: to be advised	<b>24<sup>th</sup></b> Members asked to submit ideas for workshop: ?SBF's: how to ID Small Brown Fungi or ?Beginners Workshop
<b>November</b>	<b>10<sup>th</sup></b> Members: Workshop report	-----
<b>December</b>	<b>8<sup>th</sup></b> Christmas Party	Christmas Break

## Editor's Comments

This newsletter contains the Calendar for 2015, presented in a monthly planner format for which I thank Fran and Patrick. A big improvement on the old format in my view.

Recent storm rain has brought some fungi out where I live. Hopefully it is a sign that the drought is breaking and a fruitful foray season awaits us. However we could have done without the damage that occurred in parts of Brisbane on November 27. I hope none of our members suffered. We were lucky, just getting much needed rain.

As it is the end of the off-season for forays, there are no foray reports. Instead you are treated to a feast of Tasmanian fungi from Vanessa, Patrick reports a magnificent *Macrocybe* in his garden, and Glenda has prepared a "tempter" for the Bellthorpe foray.

## Bellthorpe - Sunshine Coast Hinterland's Hidden Treasure

Glenda Walter

Located on the top of the Conondale Range, Bellthorpe was once a centre for the dairy industry. Now, only three dairies remain in the area, and much of the cleared land has reverted to trees in addition to the large areas of original forest. In the past logging was also carried out at Bellthorpe.

David and Wendy Clark have owned their property for 10 years, planting many trees and controlling weeds. They run a few cattle, and both work part time as well as letting the cottage and cabin on their two properties to guests. They have created many walking tracks through grassland, rainforest, wet sclerophyll forest, and one property adjoins the Bellthorpe National Park.



I first became interested in fungi when I saw a magnificent specimen of what proved to be *Grifola*

Patrick has prepared an informative report on the IUCN and the possibilities and processes for developing a Queensland Red List of fungi. It might all sound a bit dry, but this issue is at the core of what QMS is about and it is worth spending some time on Pat's very readable article.

Finally, Vanessa and Chris have prepared a special treat- a fungal crossword! Turn to page 6 and enjoy. You will find the answers on the last page. No cheating!

Many thanks to those who have patiently reviewed draft newsletters this year. You saved me from a great deal of embarrassment!

Merry Christmas and happy New Year to all members

David Holdom

*frondosa* on the rainforest track on their property. Knowing absolutely nothing about any mushrooms except those in supermarkets, I started photographing what I saw, thinking that I may find at least 20 species. Four years later I now have photographs of more than 250 species! Many of these I still can't identify.

Those who attended the foray in March will attest to the variety and abundance of fungi – a larger variety were collected that day than on any of our other QMS forays.

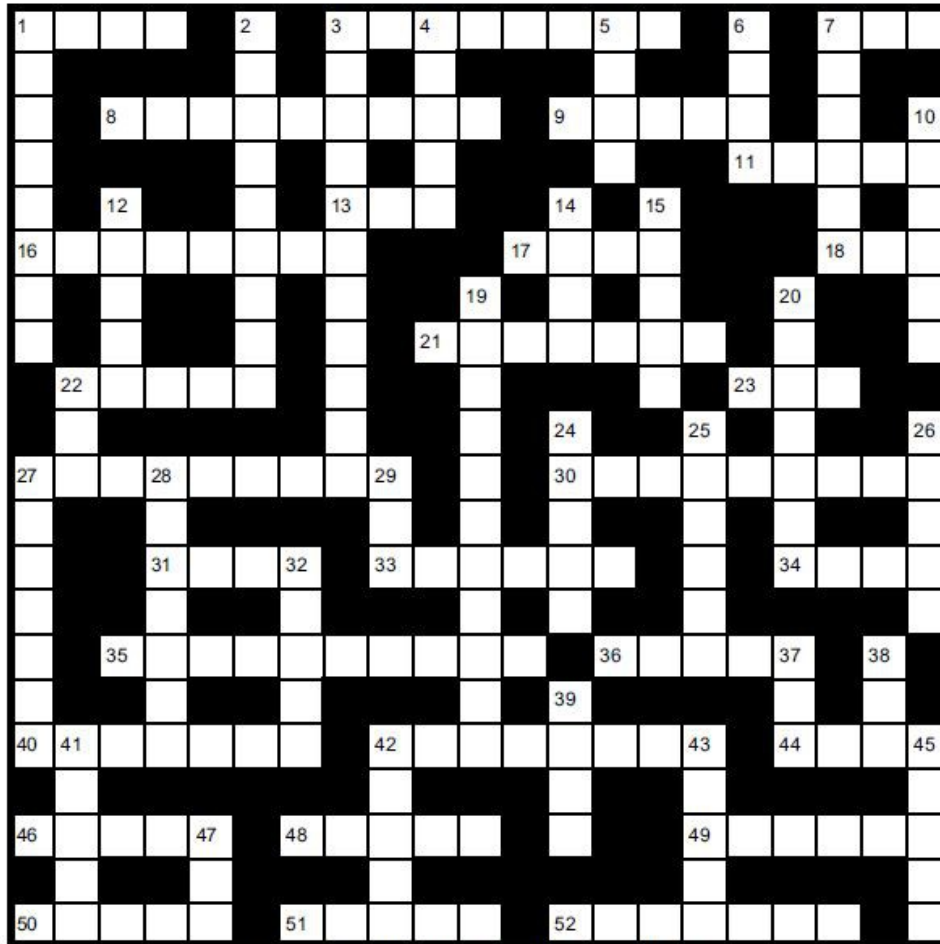
We hope that the weekend foray from Friday 27 March to Sunday 29 March 2015 will be just as successful. There is still one place available, and a reserve list in case of cancellations.



Accommodation is in the highly discounted Cottage and Cabin, or your own tent/camper trailer etc near the farmhouse.

For more information, contact Glenda Walter at [glenda.walter4@bigpond.com](mailto:glenda.walter4@bigpond.com)

# A Fungal Crossword



Constructed by Chris and Vanessa Ryan

## Across

- 1 Each species has a \_\_\_\_\_ specimen.
- 3 The study of fungi.
- 7 Yum! Steak and mushroom \_\_\_!
- 8 Fruiting body.
- 9 *Amauroderma* species have these.
- 11 Some fungi have \_\_\_\_\_.
- 13 Fungi may be a solution to this pollution.
- 16 Insects that sometimes cultivate fungi.
- 17 A popular beverage made with a fungus.
- 18 Toads were believed to do this on a mushroom.
- 21 A glassy appearance.
- 22 Stem.
- 23 Protective clothing when hunting for fungi.
- 27 Brown rot fungi eat this.
- 30 Fungal "egg".
- 31 Medium that fungi are grown on.
- 33 It is important to do this when collecting fungi.
- 34 A cereal and crop pathogen.
- 35 "Root form".
- 36 A common fruticose lichen genus.
- 40 Gilled fungi.
- 42 Mass of hyphae.
- 44 *Trichophyton rubrum* often infects these.
- 46 A unicellular fungus.
- 48 A short raid or incursion.
- 49 Recording device.
- 50 Verrucose.
- 51 A cup-like structure at the base of a mushroom.
- 52 A process of fungal cell division.

## Down

- 1 The Turkey Tail fungus is a species of \_\_\_\_\_.
- 2 Beak of an Earthstar.
- 3 Useful tools to look at things up close.
- 4 Clavariaceae are the \_\_\_\_\_ fungi.
- 5 Some fungi can do this.
- 6 *Cyathus* and *Nidula* are Birds \_\_\_\_\_ fungi.
- 7 Cap.
- 10 Major structural polymer in fungal cell.
- 12 Spore \_\_\_\_\_.
- 14 Light and lacy, a mushroom can have one too.
- 15 Part of a tree where fungi live.
- 19 Able to attract and hold water molecules.
- 20 Drugs originally developed from *Penicillium* species.
- 22 A magnifying glass helps you to \_\_\_ details.
- 24 A unit of asexual reproduction.
- 25 Fungi living with an algae or a cyanobacteria.
- 26 Hyphae are divided into cells by these.
- 27 Asexual spores formed by fungi such as *Penicillium*.
- 28 Shoes and some fungi have this word association.
- 29 *Auricularia auricula-judae*, Jelly \_\_\_\_.
- 32 Fungi and plant \_\_\_\_\_ can have a symbiotic relationship.
- 37 The Zombie Fungus controls then consumes this insect.
- 38 *Pisolithus arrhizus* is a traditional source of this.
- 39 *Xylaria grammica* is a kind of \_\_\_\_\_ fungus.
- 41 Internal or external mass of spores.
- 42 A tasty ascomycota.
- 43 Spores are measured in \_\_\_\_\_ meters.
- 45 Congo Red is a water soluble \_\_\_\_\_.
- 47 For millenia, *Fomes fomentarius* has helped people \_\_\_ to start a fire.

## The *Macrocybe crassa* in my garden

Patrick Leonard

Two years ago I noticed a large gilled fungus emerging from between the roots of a rusty fig (*Ficus rubiginosa*) that grows on a rock outcrop in my garden. The fungus was robust and fleshy and did not appear to have a stem, arising directly from the fig's roots. It superficially resembled a *Pleurotus*, but on checking the spores it did not match any known species of that genus that occur in Australia. It was also strange that it was associated with a fig, *Ficus* species seem to be resistant to most fungi, I had never seen a bracket on a live fig.



Nigel Fechner suggested that it might be a *Macrocybe crassa* that had somehow failed to develop a stem. The spores certainly matched that species.



In late October 2014, after a long drought, the fungus re-emerged, and now had very clearly defined caespitose stems. It had five distinct caps and the stems were firmly anchored to the roots of the fig, but were not growing from it. Other specimens of this fungus that I have seen in the district were all growing in grass in a park or by the roadside. The whole fruiting body weighed 4.5 kgs and the largest individual cap and stem 1.4 kgs; this is a truly robust fungus. It lasted almost a month, no insects or small mammals fed on it, suggesting that it might have been introduced, rather than native.

There seems to be no reliable published literature that confirms its edibility, but there are certainly a number of exchanges on the web suggesting that it is eaten in Thailand and there is a wealth of postings from individuals wishing to grow the fungus.

## Two Weeks in Tasmania - a Holiday and So Much More

Vanessa Ryan

In June/July of this year, I had a two week holiday in Tasmania with my husband, Chris. We hadn't planned on our holiday being so fungi focused, but we kept finding the darn things just about everywhere we went. We were faced with an opportunity that was too good to miss, so I guess I went a little fungi photography mad, and Chris did too.

Despite having an over abundance of subject matter to choose from, we still had some challenges with our photography.

We wanted to see as much of the state as possible within the two weeks. This meant a lot of driving. Because of some of the distances we had to travel in a day, we usually only had limited time to spend in an area. As a result, most of our photography was just point, click and move on. There were things

– other than fungi – that we wanted to see and do as well. It was supposed to be a holiday, after all!



I had to use the flash for a lot of my photos because, for various reasons, the light was usually dim. I prefer not to use a flash, as it can create deep shadows, hot spots and bleaching on close-up images, but I just didn't have the time to set up a tripod and do lengthy exposures. Sometimes I could hold my camera still for long enough to get a nice shot without using the flash. The old trick of resting the camera on something helped a lot with that. Our Canon 6D camera doesn't have a flash, so Chris was often taking photos at ISO 12,800. This isn't the highest ISO he got to - some were at 25,600. As a result, some of his photos are a bit grainy, but still of acceptable quality.

The weather was often against us. There was persistent rain in the north and west and at Cradle Mountain we were faced with sleet and snow. Our main problems were rain on the camera lenses and the lenses fogging up internally. My best friends became a small towel to wipe the lens dry and a plastic bag to cover the camera when I wasn't using it. I also learned not to hold my camera too close to me while I was walking, as I discovered it was my body heat that made the lens fog up.

Being in protected areas meant that we usually had limited access to the fungus. We couldn't turn logs over or dig the specimens up to see the underside. My little mirror came in very handy! Also, there is a big problem with a root-rot disease in Tasmania, so this meant that we had to keep to the tracks as much as possible to avoid spreading the disease. We often couldn't get closer views or better angles of many of our fungus subjects. Our cameras' telephoto lenses helped to overcome some of that.

Despite all of these difficulties, we still managed to take photos of over 800 different instances of fungi and lichen.

What is an instance? It's just a name I gave to a single fungus or lichen, or a group of them in the one location. It helps me with sorting and keeping track of things. I gave each instance a reference number and put all the photos of that particular instance into a folder named with that number. Each instance might have anything from one to a dozen or more photos taken of it. I've ended up with a kind of collection, only it's of photos and not real specimens.

As you know, identifying fungi just from photos can be very difficult and, with some fungi, it's simply impossible. So, whenever we found an interesting fungus that I thought could be identified from photos, I tried to take close-ups of both the top and underside to give myself the best chance of identifying it. Chris often took photos of the same fungus in case mine didn't turn out. He also took

them from different angles.

The job of identifying them all is taking me many months to do. I'm about  $\frac{3}{4}$  of the way through. I've found the book "A Field Guide to Tasmanian Fungi" to be very useful. One of its authors, Genevieve Gates, has set up a Tasmanian Fungi group on Facebook as an adjunct to the book. Now, I'm not very keen on Facebook, but I joined the group and I've found it to be very friendly, helpful and enthusiastic.

I've gone through my books, asked lots of questions on Facebook and consulted with experts such as Genevieve and Tony Young. Since I gave my talks at the QMS meetings, Nigel Fechner has also kindly given me some assistance. Again, without a specimen, it is impossible to be absolutely certain of a fungus' identity, but I can honestly say I've done my absolute best to get the identification right.

When I find out what a fungus is, or have gone as far as I can with it, I record it on a spreadsheet. The spreadsheet has details like those we write up for a foray - the reference/instance number, date, location, substrate, etc.. I'm building up quite a record of the fungi and lichen we saw during our trip. It is a lot of work. So, why am I doing it?

I guess it's because I just enjoy learning new things. Since I started on this, I've learned a lot more about fungi. Also, I thought I'd share some of our photos in a presentation for my fellow QMS members. So, it made sense to try to find out just what it was we'd seen. Finally, when I started identifying the fungi and putting together my spreadsheet, I realised that Chris and I had inadvertently collected quite a – and pardon the pun – snapshot record of Tasmania's fungi during those two weeks. So, it also made sense to try to make an accurate record of it as possible.

As my spreadsheet grew, I felt that I should really try to share all this information with as many interested people as possible. I was already sharing a few of my photos with the Tasmanian Fungi Facebook group. I wondered if Genevieve would like a copy of my written records, so I contacted her about it and, yes, she would.

I also contacted Fungimap. For those who don't know, Fungimap is a non-profit, nation-wide, citizen-science organisation dedicated to furthering the conservation and knowledge of Australian fungi. So, naturally, they are also very interested in what I'm doing. The Fungimap website has a "Submit a Record" page. The instructions on how to submit a record are easy to understand and you can download a copy of their record form from the page.

I've also been putting some of Chris' and my best photos up on Flickr. Flickr is an image and video hosting website. Anyone can access it for free and you don't have to join to be able to see the photos.

Since I started putting our Tasmanian photos up on Flickr, I've been invited to join the Australian Mosses and Lichens group and the Identifying Australian Rainforest Plants, Trees and Fungi Group. The rainforest group is very interesting in that they have created a database system for their photographs. You can search the group's photos by using some special tags that they've set up. I was asked to help them develop a more refined and, hopefully, useful tagging system and now I'm in the process of tagging the group's 3,000+ fungi photos.

I'm also a member of the Encyclopedia of Life Images Group, which is a feeder for the Encyclopedia of Life website. The Encyclopedia of Life is a free, online collaborative encyclopedia intended to document all of the nearly two million living species known to science. It is compiled from existing databases and from contributions by experts and non-experts throughout the world. Many respected organisations are involved - such as Harvard University and the Royal Botanic Gardens at Kew. The Atlas of Living Australia, which was set up by the CSIRO, is also a partner and they share photographs and information. So, eventually, Chris' and my fungi photos will end up on both the EOL and ALA websites.

I think it's great that our photos can be useful, rather

than them just sitting quietly on our computers, unseen and forgotten. It's fantastic that there are so many places out there - Facebook, Fungimap, Flickr to name just a few - where I can share our discoveries and help increase, in our own small way, the collective knowledge of Australian fungi. You never know, I might be helping to document a species that is new to science!

Both of Vanessa's presentations are available for download from the QMS website.

A Tasmanian Teaser: [http://qldfungi.org.au/wp-content/uploads/2013/05/tassie\\_teaser\\_notes.pdf](http://qldfungi.org.au/wp-content/uploads/2013/05/tassie_teaser_notes.pdf)

Tasmanian Fungi and Lichens:

[http://qldfungi.org.au/wp-content/uploads/2013/05/tasmanian\\_fungi\\_lichen\\_updated.pdf](http://qldfungi.org.au/wp-content/uploads/2013/05/tasmanian_fungi_lichen_updated.pdf)

#### Other websites mentioned:

Vanessa's Flickr page:

[www.flickr.com/photos/gugglebun/](http://www.flickr.com/photos/gugglebun/)

Australian Rainforest Plants, Trees and Fungi group:

[www.flickr.com/groups/australianrainforestplants/](http://www.flickr.com/groups/australianrainforestplants/)

Encyclopedia of Life: <http://eol.org/>

Atlas of Living Australia: <http://www.ala.org.au/>

Tasmanian Fungi group on Facebook:

<https://www.facebook.com/groups/tasfungi/>

## Some Tasmanian Fungi and Lichens

Vanessa Ryan

All photos are copyrighted to Chris and Vanessa Ryan, 2014.

### Bolete "Coles Bay"

**Freycinet National Park - Wineglass Bay / Hazards Beach Circuit**

This gorgeous fungus matches the description of a species in the Tasmanian Field Guide with the temporary name of Bolete "Coles Bay". There are a couple of other species it could be, but one of the main identifying features is that it doesn't bruise blue. You can't see it in this photograph, but on the other side of the fruiting body, someone (not me!) had scratched the cap and stipe. There was no sign of any blue bruising. It could have faded, but the marks looked to be quite fresh. Also, we found the fungus growing very close to the Coles Bay lookout on the walking track. So we were definitely in the right area for Bolete "Coles Bay".



### *Panellus longinquus*

Cradle Mountain - Pencil Pine Falls and Rainforest Walk

This species is quite variable in colour. We saw some that were a lovely pink, like this one, and others that were the colour of honey. It has been found in Queensland.



### *Chlorovibrissea* sp.

Forestry Tasmania Reserve - Duckhole Lake

This is a very unusual little pin-shaped Ascomycete. Chris found it growing on top of a very large, old mossy log. It isn't in the Tasmanian Field Guide book, but I found something that looks just like it in Fuhrer's Field Guide - *Chlorovibrissea melanochlora*. Nigel Fechner thinks that it might also be *Chlorovibrissea phialophora*, a species that has been found in New Zealand. As far as I'm aware, no *Chlorovibrissea* species have yet been found in Tasmania and I don't think there are any records of the genus being in Queensland, either.



### *Hericium coralloides*

Mt Field National Park - Russell & Horseshoe Falls Track

This magnificent specimen of *Hericium* was growing right beside one of the most popular walking tracks in the state. You simply could not miss seeing it and it has to be the most photographed fungus in Tasmania. Pictures of it kept popping up regularly in the Tasmanian Fungi Facebook group. When we saw it, it was beginning to age a bit. You can just see the discolouration in the area right at the bottom. This species is edible, so it was lucky to be growing in a protected area, otherwise I'm sure someone would have made a meal of it! It's also found in Queensland.



### *Clavulinopsis sulcata*

Blue Tier - Goblin Forest

This particular specimen has got to be the second-most photographed fungus in Tasmania. Images of this little orange club kept turning up on the Tasmanian Fungi Facebook Group. I know it was the same fruiting body because of a very distinctive split on one of the clubs and the photos were all taken at the Goblin Forest. This species has also been found in Queensland, only we call it *Clavaria miniata*.



## Two *Cladia* species and a *Cladonia*

### Blue Tier - Goblin Forest

There are three different species in this photo. I think the green, solid looking one is *Cladia inflata*. The very fine lichen in the middle is a *Cladonia* - probably *Cladonia rangiferina*. Even though this is definitely a lichen, its common name is reindeer moss. Yes, reindeer do eat it in the northern hemisphere. Last but not least, on the right is *Cladia retipora* – the coral or snow lichen. This lichen is found in Queensland and it is very common in the Granite Belt region.



## Fungal Conservation - First steps to a Queensland Red List

Pat Leonard

### Introduction

The idea of protecting habitats and species has been around for a very long time. The oldest protected areas are probably the hunting parks established by Kings and Emperors in Europe, China and Japan. The world's first National Park, Yellowstone, in the western United States was designated in 1872. The second was the Royal National Park in New South Wales in 1879. It is no accident that both happened in countries involved in rapid change due to European settlement, the main purpose of National Parks was to preserve landscapes so that future generations could see what the country was like before the grasslands were ploughed, the forests felled and animal species hunted to extinction. But it was not until the immediate aftermath of the Second World War that attention turned more specifically to nature conservation for its own sake.

The first director general of UNESCO, Sir Julian Huxley, helped establish the International Union for the Conservation of Nature (IUCN) in 1948 to preserve flora and fauna. IUCN led the way on the protection of areas through national parks and biological reserves. Its second president (1954-1958) was Roger Heim the ethno-mycologist who was Director of the Natural History Museum in Paris. It was through the IUCN, in 1964, that the concept of listing species in danger of extinction first arose. They started with plants and have gone on to list mammals, reptiles, birds, amphibians, fish, insects and molluscs.

In 1992 the Convention on Biological Diversity was drawn up and agreed at the Earth Summit in Rio. It

introduced the concept of 'sustainable development' and suggested the preparation of National Biodiversity Strategies and Species Action Plans. Australia ratified that treaty, developed a National Strategy for the Conservation of Australian Biodiversity and began to establish a national reserves system. Some species action plans have also been developed, for example for the northern bettong, which eats fungi and is being actively studied by QMS member Susan Nuske.

Where do fungi figure in this story, well they don't. Not at Rio, not in the National Biodiversity Strategy, not in any Species Action Plans. See Pouliot & May 2010 for a comprehensive review.

The first recorded concerns about the decline of fungi related to the loss of lichens as a result of air pollution in Northern Europe in the 1960s. In 1985 the European Council for Conservation of Fungi was formed. National Red Lists containing fungal species began to appear. There is however no national Red List for fungi in Australia and species conservation issues are matters left to the state and territory governments. By the end of 2014 three fungi (two are lichens) had made it on to the global Red List at IUCN. Three have been listed for protection in Australia including two lichens and the 24 species strong *Hygrocybe* community at Lane Cove in Sydney. The *Hygrocybe* community is listed as critically endangered, with eight species specifically listed as vulnerable or endangered.

No fungi are specifically listed for Queensland in any conservation legislation.

The International Society for Fungal Conservation (The QMS are founder members) is trying to encourage more action and has launched a Global Fungal Red List Initiative. Details can be found at: <http://iucn.ekoo.se/iucn/about/>. It is against this background that QMS needs to consider how it might contribute.

## Why conserve?

It is important to remember why we as a Society might wish to conserve fungi. The main arguments fall under four separate headings:

- **Aesthetic.** The original objective of national parks. Fungi are part of our common heritage. They are interesting, challenging, beautiful, edible and poisonous and we protect them so that future generations may share our experience.
- **Economic.** Fungi have provided humans with enormous benefits, both directly in the bread that we eat, the medicines that we take and the beer and wine that we drink; and also indirectly through the role that fungi play in sustaining many plants and recycling nutrients.
- **Ecological.** Fungi are key members of many living communities. Their roles are as yet poorly understood. Removing fungi indiscriminately from food chains and nutrient cycles could have profound consequences.
- **Cultural.** Some fungi have played important roles in some cultures as food, medicine and spiritual symbols.

We cannot forecast what uses may be found by future generations for the services that fungi perform, or the chemicals they produce.

## Options for action

**Do nothing.** This is the easiest option. Fungal species would continue to decline at the current rate (which is unknown) and no one would notice, other than a few members of the QMS. Some critical ecosystems might be damaged where fungi play an important role in their sustenance and some animals that have fungi as an important part of their diet might be threatened.

**Pass the buck.** This is more difficult for the QMS because there is an issue of who to pass it to. The most obvious candidate is Fungimap. The problem is that without new funding they are unlikely to be able to take effective action. As the only national organization concerned with fungi, we would in any case be looking to them to take the lead with the Federal Government. A variation on this approach is to argue that we should focus on conserving habitats and fungi will be conserved. The trouble with this approach is that it has been shown not to work. The classic example being grassland pastures where *Agaricus* species disappear when small changes are made in grazing intensity or fertilization regimes. The habitat is still there but the fungi are

not.

**Wait until we have better data.** This is another easy option. For macrofungi it looks as if it will take in the order of 350 years for all of the Queensland species to be described, but assuming that a sufficient number go extinct during that period, it might be possible to shorten that to say 250 years. For microfungi, the position is worse, with no active taxonomy programmes outside the narrowly defined field of plant pathology, that is, the fungi that cause commercial damage to crops, with incidental work on pathogens of non-crop species. Once the fungi have been described we can assume that some time will be needed to study their distribution and frequency patterns. This is very like the 'do nothing option', but conceivably a Red List could be generated by 2300.

**Lobby the Queensland Government.** Protecting the environment and the species that constitute it, are the responsibility of the State Government. We all benefit from having a healthy and diverse environment, but no one benefits sufficiently to pick up the tab, so we charge Governments to undertake this work communally. In Queensland, the Department of Heritage and Environmental Protection (EHP) have responsibility for threatened species. Unfortunately, the legislation under which they operate, only makes mention of plants and animals, not fungi. QMS made a submission to the Parliamentary committee that reviewed changes to the Nature Conservation legislation requesting the inclusion of fungi, but no changes were made. It is probably worth pursuing the issue to see whether some fungal species might be included, alongside the plants and animals listed and it is open to QMS to nominate candidates using EHP's published procedures.

**Proposing candidates for the IUCN Red List.** The Global Fungal Red List Initiative makes clear that anyone can make proposals for additions to the Red List. The advantage of doing so is that it would focus some attention on fungi, lead to more careful recording and might possibly result in some conservation action for their protection. The disadvantage is of course that with the current scant knowledge it is almost certainly the case that some of the species selected will prove to be neither rare nor threatened. That has been the case in other countries that have drawn up Red Lists. (See reference on how to handle uncertainty).

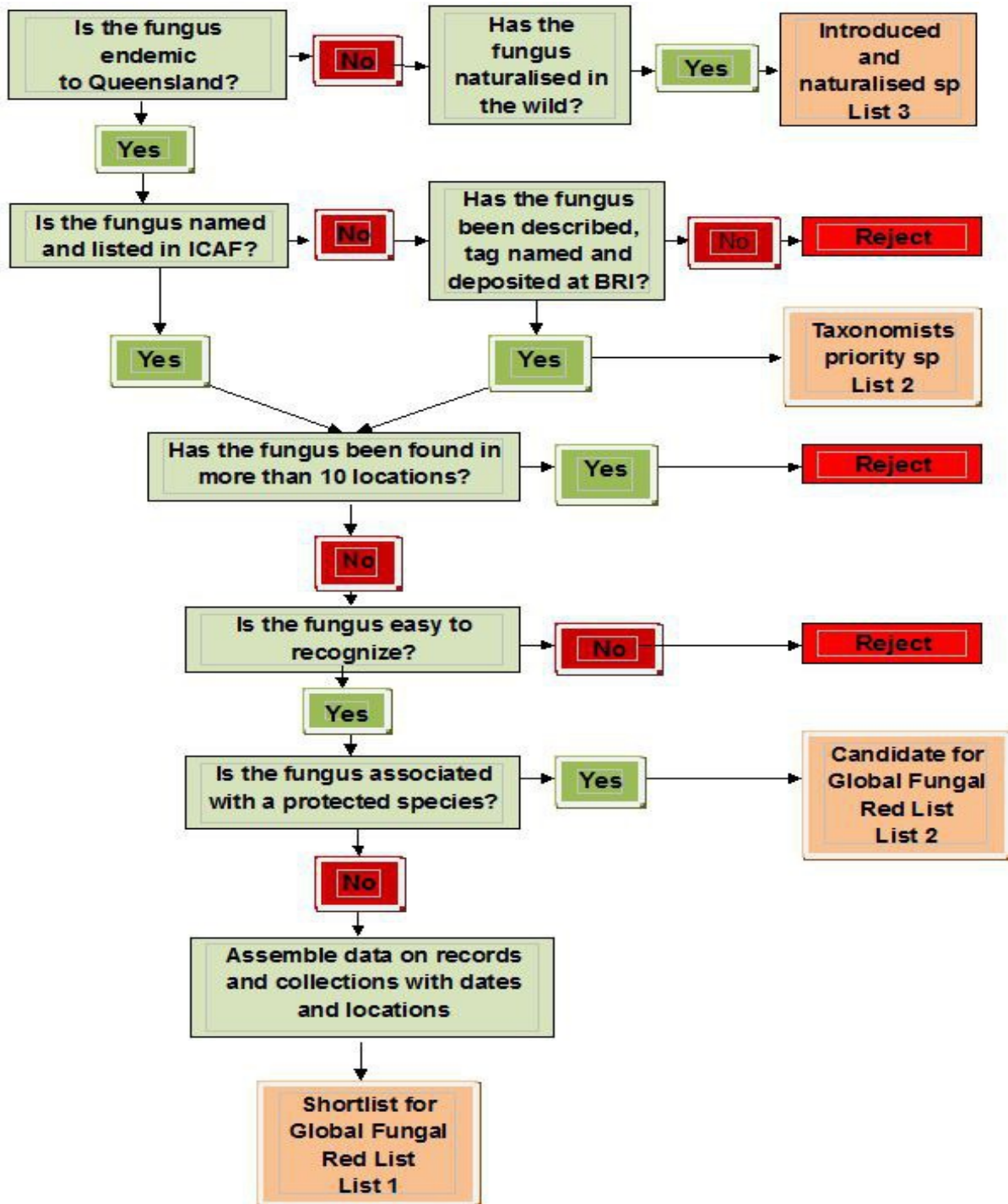
## Selecting candidates.

The only practical way forward would seem to be to review species that have been recorded and choose some likely examples from each of the main habitats in Queensland. So, for example, we might

choose two species of macrofungi for wallum, two for rainforest and so on. One might be an ectomycorrhizal species and the other a saprotroph (rotter!) There are no doubt other filters we could use. It is important to choose species that can be easily recognized so that we do not impinge on the scarce taxonomic resources in Queensland. One should perhaps aim to select no more than 20 candidates in total. For comparison, there are 107

species of animals and more than 350 species of plants currently on the vulnerable lists in Queensland. Both EHP and the IUCN accept that the list could include un-named species so long as there is a good description and a specimen. This might be seen as a 'priority list' for taxonomic attention. A suggested framework for selecting the candidates is set out below.

### Selecting species for a Queensland Red List



## The way forward

The process will require putting together a preliminary list. It would be valuable if QMS members could consider and nominate candidates during the 2014/2015 season. Members could also adopt a candidate and help collect information on it. QMS would then need to run the process suggested above to whittle the candidates down to a shortlist. The timetable for the Global Red List Initiative suggests that the QMS will need to think about submitting a list of candidates by October 2015. We need to decide a preliminary list by about June to give enough time for species to be worked up for submission.

QMS members are invited to participate.

### Further reading:

Buchanan, P.K. & May, T.W. (2003). Conservation of

New Zealand and Australian Fungi. *NZ Journal of Botany* 41: 407-421.

Department of Conservation, New Zealand (2008) *New Zealand Threat Classification System Manual*.

IUCN (2014) *The IUCN Red List of Threatened Species Brochure*.

Minter, D. (2010) *A future for fungi – the orphans of Rio*. *Fungal Conservation*.

Pouliot, A.M. (2014) *A forgotten Kingdom*. *Australian Wildlife*, Spring 2014.

Pouliot, A.M. & May, T. W. (2010) *The third 'F' – fungi in Australian biodiversity conservation: actions, issues and initiatives*.

Taylor, J. (2014) *Towards assessment of fungi including lichen-forming species, for the IUCN Red List – Species nominations needed ! Fungal Conservation*.

*Annex 1 below sets out the International Society for Fungal Conservation's position and their time schedule for 2014. This arrived too late for QMS to participate in 2014, but there will be another round in 2015.*

## Annex 1 The Global Red List Initiative

### Fungi - overlooked in international conservation initiatives



The aim of the global IUCN Red List of Threatened Species™ is to convey the urgency of conservation issues to the public and policy makers, as well as help the international community reduce species decline and extinction.

The IUCN Red List is widely recognized as the most comprehensive, objective global approach for evaluating the conservation status of animal, fungal and plant species, and it has a large impact on the setting of priorities in nature conservation.

However, a major limitation of the present global Red List is that fungi, despite being one of the most diverse and important groups of organisms, are basically absent from the list as no initiative to evaluate fungi has yet been made. Of the almost 20,000 globally red listed species, all but three are animals and plants. The three fungi consist of two lichens and one mushroom. This gross underrepresentation of fungi on the global Red List greatly hinders the inclusion of fungi in conservation discussions, access to funding

programs, policy decisions, and conservation action.

### Fungi are threatened

Species of fungi are threatened by habitat loss, loss of symbiotic hosts, pollution, over exploitation, and climate change, but the vast majority of fungal species have not been assessed.

### The initiative aims to get 100s of threatened fungi globally red listed

This initiative aims to facilitate and to coordinate a concerted effort by the global mycological community to get at least 300 species of threatened fungi assessed and classified as globally red listed. In doing so, the initiative will raise the awareness of fungal conservation among mycologists, the conservation community, policy makers and the general public.

The purpose of this website is to develop a list of fungal candidate species that are likely to be globally red listed when evaluated, and to engage the global mycological community in this procedure.

Hopefully, the initiative will attract, educate, engage, and facilitate activities by both professional and amateur mycologists in fungal conservation. The submitted data will be fully accessible on the website, and the mycological community will be encouraged to add to and/or comment on the information to facilitate data accuracy and completeness.

## The overall goal

The overall goal of the project is to get as many globally threatened fungi as possible on the IUCN's official global Red List by the end of 2014. The aim is to reach a least 300 species. This will be accomplished by:

1. Mycologists around the world supplying information on the status of as many threatened fungal species as possible
2. Having the submitted information openly available for comment and revision on this website
3. Evaluating the proposed species using IUCN Red List criteria. The evaluations to be undertaken by IUCN's fungal specialist groups and IUCN Red List unit members.
4. Submitting fungal species satisfying IUCN criteria for inclusion on the IUCN Global Red List

## Which species should be suggested?

In principle, any fungal species can be suggested to be globally evaluated. It is certainly valuable to have the global status assessed, irrespective of perceived threat status.

However, the focus of this project is to identify threatened fungal species from different fungal groups and from different parts of the world. Therefore, we encourage nomination of species that are most likely to fulfil the criteria to become globally red-listed. In particular we encourage a focus to be put on declining species, even with relative wide distribution ranges to be nominated along with extremely rare species with narrow distributions, as those species provide opportunities to develop conservation actions.

We also encourage prioritization of species that could attract the interest from the public, and hence also from decision makers and politicians .

## Requirements to potentially qualify for the Global Red List

At least one of the criteria of IUCN below needs to be fulfilled:

1. The population of the species has globally declined by at least 15% during the last 10 to 50 years (the A-criteria)
2. The species has a geographically restricted distribution globally (single – to few countries) and is declining (the B-criteria)
3. The species has a globally small population and is declining (the C-criteria)

4. The species has a very small global population (< than 2000 reproducing fungal individuals) or is confined to very few and restricted areas (< 10 locations)

In the assessments of the criteria above, both known and yet unknown localities of a species need to be considered.

## The procedure

This website is publicly available and anyone can register. The layout and workflow are “Wiki-like”, in the sense that all registered users can submit species proposals, contribute with data and make comments on already submitted proposals and content. Here is how to get started:

1. [Sign Up as a new user](#) (you will then receive an e-mail with a confirmation link to complete your registration)
2. Sign in with your login details. Check the option “remember me” if your not using a public computer
3. Fill out and complete the User Profile form with your contact details

Instructions on how to get started with adding species proposals is available, [both as step-by-step instructions in plain text](#) and in a [video tutorial](#).

Once your proposal has been submitted it is publicly available to view by both registered and unregistered users on the website. However, only registered users are authorized to add comments and to contribute with additional content. The user who first submits a species proposal (the proposer) is considered to be the “owner” of the submitted species and its associated content. This means that all other users are prevented from editing the main content, but they are encouraged to make additional contributions and comments that can be of help to the assessors and the IUCN Specialist groups that ultimately will evaluate all user contributions. The proposer can at any time revise it's submitted content or choose to reset the proposed status back to default.

The website is just launched and is still evolving. All types of feedback, comments and suggestions on how to improve the website and the workflow is most welcome.

## Who can contribute?

Proposal may be made by individuals, small groups of collaborators, mycological societies, or institutions. The success of this project will depend on the engagement of the mycological community, both professional and amateur, to nominate species, provide the needed information, and to check and

comment on the submitted data to ensure that the required data are available and are as complete and accurate as possible. The final Red List evaluations will be based on the information provided by the nominators and participants who have commented on the proposals.

### Time schedule

The web site for nominating and uploading information of fungal species is planned to go public 1 September 2013. A call for participation will be sent out to mycologists all over the world through existing international and national mycological networks encouraging participation.

Nominations of fungi to be evaluated can be made until June 1st 2014

The fungal specialist groups will successively evaluate the nominations and deliver to IUCN a proposed list of fungi to become globally red listed by August 1st 2014.

A status report will be available on the web-site and delivered at the 10th International Mycological Congress in Bangkok, Thailand.

The IUCN global Red List of 2014 will be presented

October/Nov 2014. Hopefully several hundred globally threatened fungi will be included on the List.

This specific initiative will conclude by the end of 2014, but the web site and process to compile information and suggest fungal species to be included to the global Red List will continue.

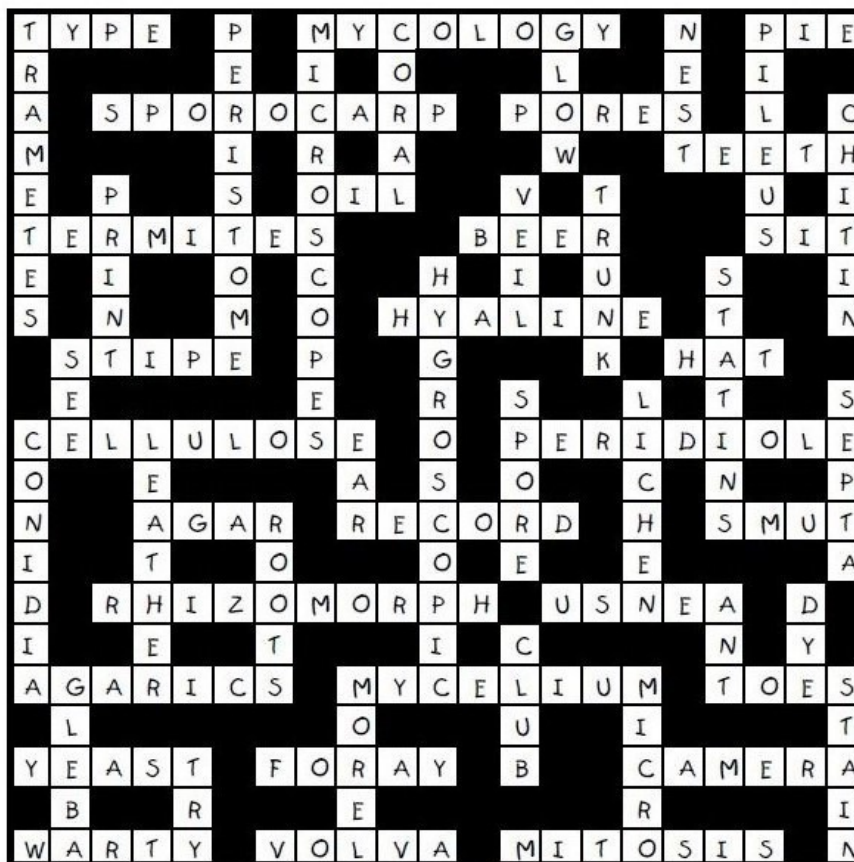
### Organization

The initiative is being organized by the five IUCN fungal specialist group chairs together with Craig Hilton-Taylor at IUCN's Red List Unit. The project is led by Greg Mueller, chair of the mushroom, bracket and puffball specialist group. Michael Krikorev and Anders Dahlberg, mycologists at the Swedish Species Information Centre, have developed and run the web site. The global red-list evaluations of the nominated fungal species will be accomplished by the appropriate fungal specialist group under the coordination of Greg Mueller with supervision from IUCN.

### Funding

The Mohamed bin Zayed Species Conservation Fund ([speciesconservation.org](http://speciesconservation.org)) is generously supporting the initiative.

## Answers for the Fungal Crossword



Constructed by Chris and Vanessa Ryan