OTWAY WATER BOOK 55 A

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"Why a Subterranean National Park?"



www.otwayrangessubterraneannationalpark.org.au

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February 2023.

Malcolm Gardiner

www.otwaywater.com.au





Acknowledgement.

I acknowledge and respect the Traditional Owners and especially the Gulidjan Traditional Owners as original custodians of a greater part of the area of the Otway Ranges dealt with in Otway Water Books.

PREFACE by Bruce Pascoe.

All our natural supplies of underground water are vital for our nation and should Page | 3 be protected at all costs on behalf of our Commonwealth. While it is practical to use some of the water it must be done in a sustainable way and every effort must be made to prevent pollution of the supply. I support the care of these resources in the Otways.

Bruce Pascoe.

Bruce Pascoe is the author of many books including...

"Dark Emu" (Magabala Books) and

"Convincing Ground – Learning to fall in love with your country."

(Aboriginal Studies Press)

Victorian State Government Acknowledgement and Commitment



An extension of the Great Otway National Park to include a Subterranean National Park can only add to the State Government's "... ability to care for Country."

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Otway Water Books 55 A, B, C and D.

Otway Water Books 55A, 55B, 55C and 55D present a case supporting the creation of a Subterranean National Park in the Otway Ranges, Victoria, Australia.

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Book 55A.

This Book provides a very simple and quick to read overview of the initiative.

This website www.subterraneannationalpark.org.au provides a similar summary.

Book 55B.

Book 55B was the first book written (September 2019) and resulted from efforts to find another way of protecting the subterranean from over exploitation of its resources, in particular groundwater. Local communities had been "fighting" against the mining of groundwater from deep water aquifers for over 40 years, had enormous success stopping the mining in 2019, but there was no certainty that similar exploitation would never return. The initiative of creating a Subterranean National Park would hopefully provide an additional layer of scrutiny in the event of any future subterranean resource exploitation returning.

Book 55B sets out a very compelling argument for this initiative. The background decision by the Minister for Water to declare, in 2019, the Gellibrand Groundwater Management Area as an area to be protected, and, that the annual extraction of groundwater from all layers of the subterranean be set at ZERO, forms part of this compelling argument.

Book 55C.

Book 55C contains the Appendices for Book 55B.

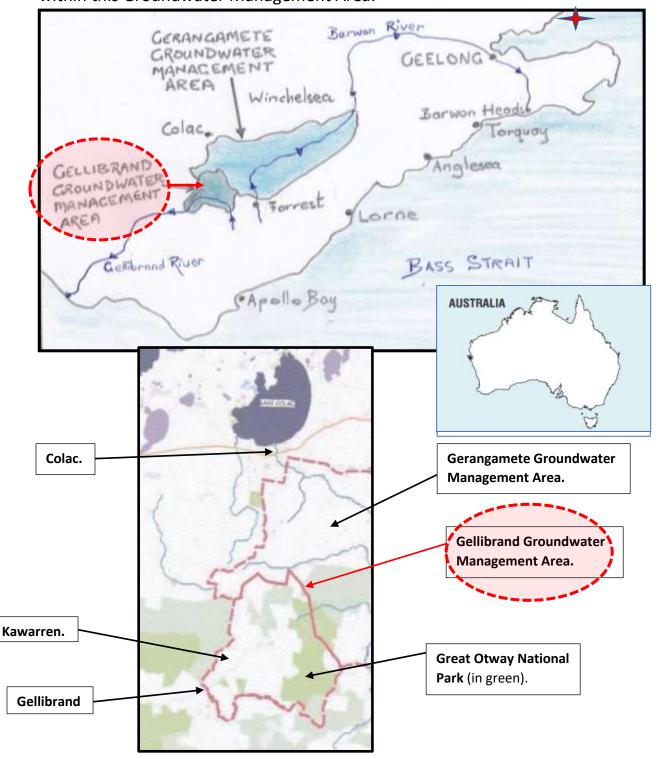
Book 55D.

This Book is a work in progress and summarises the ever expanding and overwhelming public support for a Subterranean National Park in the Gellibrand Groundwater Management Area.

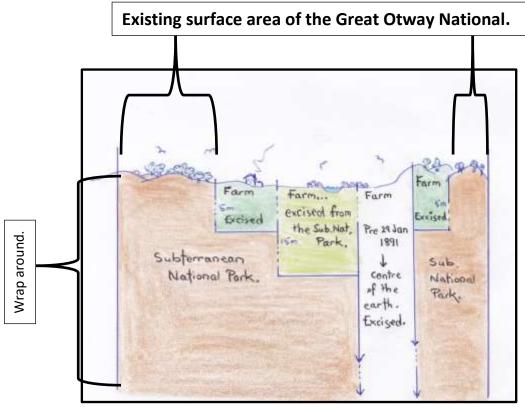
The Proposal

To have the Victorian State Government extend the Great Otway National Park that presently exists in the Gellibrand Groundwater Management Areas, to include a Subterranean National Park that wraps around the free hold land within this Groundwater Management Area.

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A Wrap around Extension of the Great Otway National Park.



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The existing
National Park
would extend
down and wrap
around, and,
under all freehold
land within the
Gellibrand
Groundwater
Management
Area.

Benefits of the Park.

- Subterranean ecosystem will be protected.
- Surface ecosystems dependent on a healthy subterranean will be supported.
- Landholders above the Park can be assured of a natural, healthy and sustainable environment under and or around their farms.
- The Subterranean Park will be easy to manage and extremely cost effective for the Government to manage.
- Any future exploitation of subterranean resources will have a better chance of being utilised in a sustainable fashion.

INTRODUCTION

Why indeed would one consider creating a Subterranean National Park in the Victorian Otway Ranges? The answer is quite simple and the arguments for its creation are compelling.

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Over the last four decades inappropriate land management practices and especially water management has lead to approximately 3 cubic kilometres of subterranean ecosystems being seriously affected and impacted across at least two Groundwater Management Areas in the Otway Ranges (see Appendix Three, page 27). Three subterranean cubic kilometres! And, this is ignoring the terrestrial or observable surface ecosystem effects i.e. the impact to at least 480 square kilometres of surface area; a 30 kilometre fish kill down the Barwon River from acid and heavy metal contamination; perennial creeks stopped flowing for many months of the year; platypus colonies wiped out; wetlands turned into Actual Acid Sulfate Soil wastelands "... at times during the year (written in January in 2021), up to 0.5 tonnes of pure sulfuric acid (acidity equivalent) is being released from the swamp into Boundary Creek each day. "(1)); not to mention the elevated risk of wild fire or the economic hardship and threatened viability of farmland and forestry enterprises.

The major cause of these things was the extraction of huge amounts of groundwater for use in Geelong. Thankfully this has stopped but the demand for water, gas and other subterranean resources could see a return to the exploitation of these resources in the future. Consequently, the creation of a Subterranean National Park would provide one more layer of scrutiny that would ensure that the exploitation of any subterranean resource would be conducted appropriately and sustainably.

However, there is a much bigger picture at play than just water or other resource exploitation issues in this proposal for a Subterranean National Park. The bigger picture is encapsulated in the aims and objectives of the National Park Act, 1975.

"... to preserve and protect features in a Park of archaeological, ecological, geologically and scientific interest."

And, in the Preamble to the National Parks Act it states...

"...certain Crown land characterised by its predominantly unspoilt landscape, and its flora, fauna or other features ... reserved and preserved and protected permanently for the benefit of the public." A subterranean park can help achieve this in "spades."

The Original Proposal.

Originally and rather ambitiously, it was proposed that both the Gerangamete and the Gellibrand Groundwater Management Areas form the boundaries of this Park. However, the time and work required to ensure that all landholders in both GMA's be approached and involved became a daunting task. It was decided $^{Page \mid 10}$ to work towards a Subterranean National Park for just the Gellibrand Groundwater Management Area. A smaller area, less landholders to interview and involve, and, this GMA already has a surface National Park and Reference Area within its boundaries.

In reality what would be happening is the present National Park would be extended to wrap around and under the land formations presently owned, controlled and operated by the private landholders of the area.

An Understanding of the subterranean.

The subterranean in many ways is a new frontier. There is still so much unknown and yet to be learnt. There are worms, fungi, bacteria, burrowing crayfish, invertebrates, stygofauna to name a few of the subterranean lifeforms with dependent and interrelating relationships. Perhaps the roots of surface vegetation should be regarded as life living in the subterranean. Lifeforms living and moving between the subterranean and the surface environments deserve consideration where the subterranean interacts with the surface ecosystems? Much to be learnt. Much to protect.

Just One Environment.

This leads to the argument that the surface and subterranean ecosystems and environments should be regarded as one system. In reality it would appear that if humans look after the subterranean then the surface environment has a chance to look after itself. Disrupt what is happening underground and the disruption will transfer and manifest as impacts and changes at the surface.

A Glimpse Into the Subterranean.

It seems impossible to imagine...

"That there can be 10 billion living things in a tea spoon of healthy soil ..." (5) "...in the amount of soil you can scoop up in a single go with your bare hands, there can be:

5000 insects, arachnids, worms and molluscs (from up to 500 species) 1000,000 protozoa (from up to 500 species) 10,000 nematodes (from up to 100 species) 500 metres of plant roots (from up to 50 species)

100 billion bacteria (from up to 10,000 species) 100 kilometres of funfal filamentrs (from up to 1000 species) Plus algae, archaea and more."(5)

To include and understand all of the subterranean lifeforms and how this area $\frac{1}{Page \mid 11}$ of nature functions, is still beyond the grasp of man. A Subterranean Park status would help ensure the Precautionary Principle be adopted when proceeding with future developments.

Out of Sight out of Mind.

Being out of sight, any impacts are out of mind, and, can easily be overlooked until they manifest themselves at the surface. A glimpse into the complexity of the subterranean or substrate can be gained from the work of internationally renowned fungi expert, Alison Pouliot. Many of the following quotes have been taken from two books. One written by Alison⁽²⁾ and the other co-authored by Alison. (3) These quotes weave a commentary that best describes why the subterranean requires such special care and attention. The applicability of these quotes is not just peculiar to fungi, but all subterranean lifeforms.

A Few Words About Fungi.

Fungi is "...one of the largest and most pivotal kingdoms of organisms on the planet."(3) And, "...can persist for years, even hundreds or thousands of *years.*"(3)

"Fungi exist in staggeringly diverse environments."(2) The subterranean included.

"...the fungal arena is vast and includes microscopic fungi that inhabit terrestrial and aquatic environments, as well as yeast that can be found in diverse liquid environments."(3) And yet, very little is know about the range and functions of the Australian species. Australian truffles number an estimated 2,000 species (pers com., Alison Pouliot).

A Woven Natural Substrate of Intrigue.

Since something like 600 million years ago over 50,000 fungi have had subterranean mycorrhizal partnerships with over 300,000 plants. (3)

(Mycorrhiza – the mutualistic symbiotic association between a fungus and the roots of a plant.

Symbiosis – an intimate relationship between two or more different organisms.)(3)

The Subterranean Web of Life.

The underground web of mycorrhizal fungi systems can be extensive, locking into or onto plant roots providing a range of benefits – vital nutrient and water uptake, binding of soil, aerating and providing spaces between particles, filtering water as well as the ability to "...protect plants from environmental Page | 12 stresses and soilborne pathogens."(3)

"Most plants rely on mutually beneficial symbioses with fungi for their survival. This tangle of relationships is essential to life and evolution, not an alternative or secondary strategy."(2) However, upsetting this natural balance by disturbing the subterranean processes manifests in numerous detrimental ways. Otway Water Book 1, pages 68, 70 and 79 discusses Farmar-Bowers 1986 warnings of groundwater drawdown causing pathogen and insect attack. By 2002 signs of such an impact appeared in vegetation surveys. Destroy the mycorrhiza fungi and the vegetation dies. The soil can also become hydrophobic and plants struggle to revegetate. The 2011 Otway Water Book 14, pages 42-44, also discusses the results of destroying the mycorrhiza environment.

Extracts from Alison Pouliot's Book "The Allure of Fungi." (2)

Even though Alison's book "The Allure of Fungi" has been written specifically with fungi in mind her work could as easily be applied to any of the creatures living in the upper layers of the subterranean.

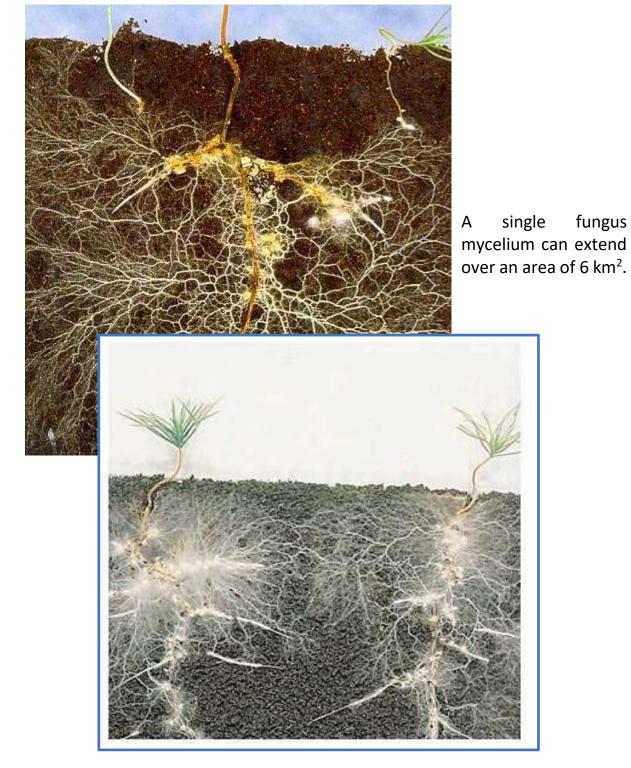
Soil with its legion of bacteria is alive and is an integral part of the subterranean "Soil is the foundation of life and the place of the dynamic nourishing and flourishing of the teeming unseen, in which life also ends. It is the most biologically diverse and intensely productive part of almost every terrestrial ecosystem as the interface between dead rock and animate life. The darker organic layer that forms near the soil's surface, known as humus, lives and breathes through the activities and interactions of myriad organisms. Soil shelters the intimate interrelations of these organisms, largely bacteria, fungi and invertebrates that support producers and hence the biosphere. Soil maintains hydrological and nutrient cycles, sequesters carbon and stabilises climate. It filters, absorbs, buffers and stores, making life possible on earth. Its inhabitants add to the organic layer and collectively underpin the overall fertility, productivity and resilience of the soil. Soil is also not just a solid. Healthy soil is sponge-like, filled with pockets of air that make it liveable for its inhabitants. Within this matrix of air pockets, supported by scaffolds of mycelia and the roots of plants, water gently percolates to deeper soil horizons, As soil is the foundation of almost every terrestrial ecosystem, disruption to soil compromises its inhabitants and hence their capacity to support it. The complexity and continuity of the process in this thin lamina of life are impossible to untangle, operating as an inseparable web of interwoven lives, with soil only being viable as long as its inhabitants flourish."(2)

This upper layer of the subterranean is a complex system of interrelations.

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fungus

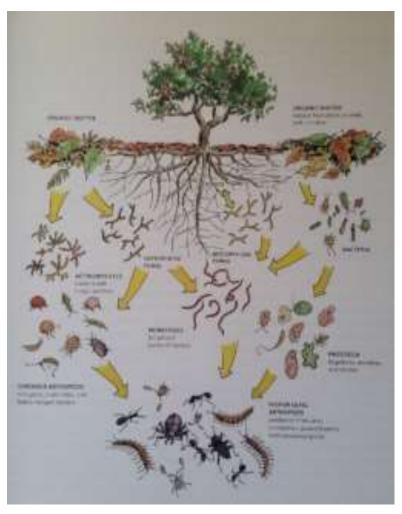
"Pick up a handful of old-growth forest soil and you are holding 26 miles of threadlike fungal mycelia if it could be stretched out in a straight line."



Otway Water Book 55 A.

What about other Subterranean Lifeforms?

This diagram depicts a multitude of lifeforms living in the subterranean. There are many microscopic lifeforms as well.



beetles, Page | 14 Ants, worms, spiders, mites, centipedes, millipedes, snails, stygofauna crustaceans such as Copecoda, Syncarida, Isopoda, Amphipoda and stygofauna ogligochaete worms such as Tubificida.

Crayfish Burrowing are throughout found the Gellibrand Groundwater Management Area.

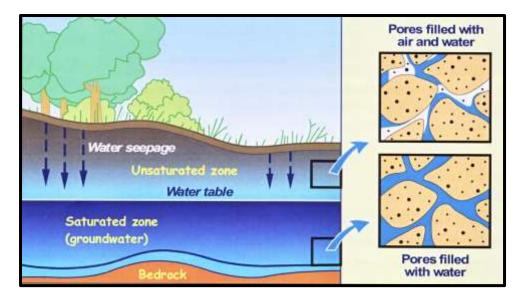
Source: Capricorn Caves website.

A State of Relative Equilibrium.

A relative state of equilibrium exists within the ecosystems throughout the Gellibrand Groundwater Management Areas that has developed over millennium. The lifeforms within the Otway Ranges subterranean have evolved and adapted to the conditions found in this unique and isolated pocket of habitat found in Victoria. Every effort to preserve the diversity, balance and survival of the lifeforms within this area must be undertaken. Water as one of the driving forces behind the successful preservation of the subterranean cannot be understated.

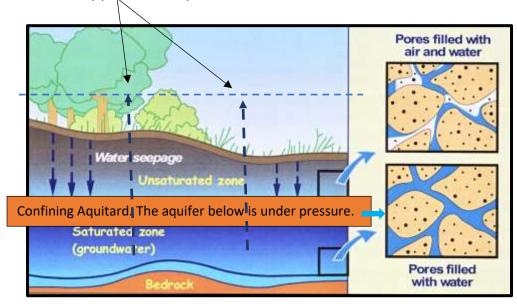
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How Important is Water to the Otway Ranges Ecosystems.



SOURCE: Australian Centre for Groundwater Studies. (4)

The two Groundwater Management Areas originally proposed as a Subterranean National Park are unique in that the majority of the area has an artesian pressure head from the deep aquifer zone which has the capacity when tapped into, squirt water into the air.



This helps buffer dry periods, reduces fire risk and provides a much more stable subterranean environment throughout the region.

The ecosystems in all of these various structures, form part of a healthy, thriving environment supporting lifeforms. Water plays a significant role in this process.

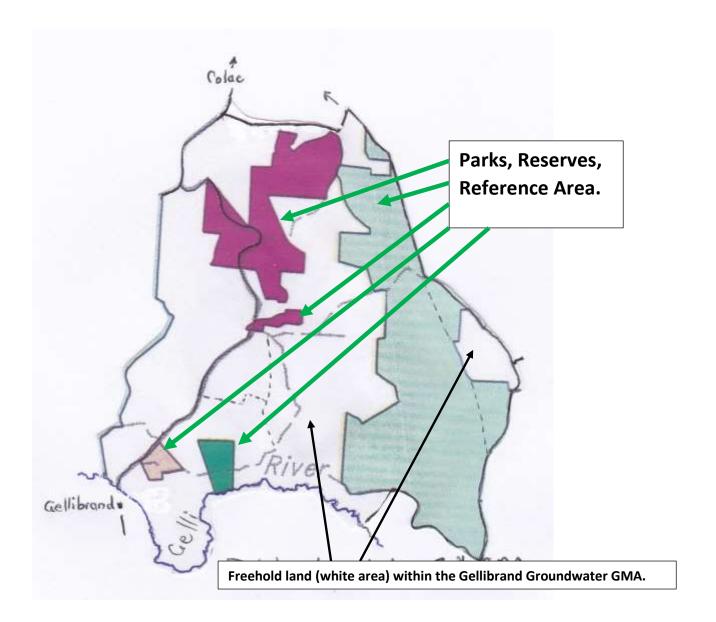
CONCLUSION.

It is hard to tell the number of freehold landholders there are in the Gellibrand Groundwater Management Area but an estimated calculation puts the number at around the 200 mark.

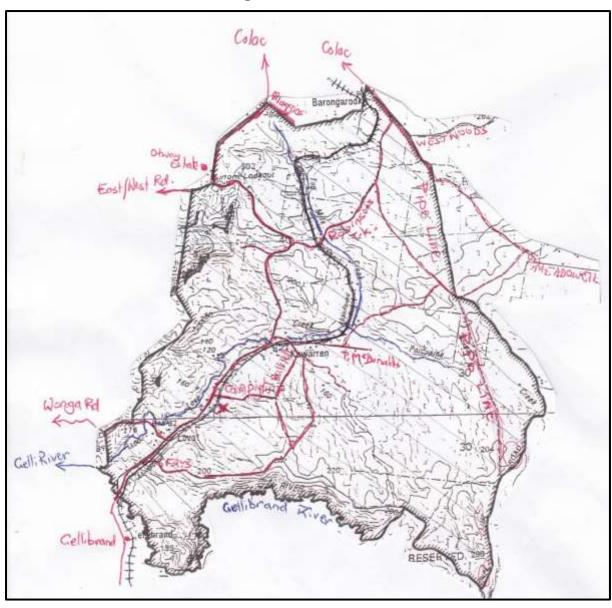
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At this stage **157** of these landholders have been approached six have declined to sign the form (Appendix Four, page **26**) for a variety of reasons.

((1.Religious grounds. 2. "Just knick off." 3.boundary dispute with the Government. 4.disagree with the idea. 5.anti anything to do with a National Park - a fisher & shooter. 6. not interested at this stage)).



Gellibrand Groundwater Management Area.



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First in the World of its Kind.

Being the first of its kind in the world; cheap and easy to administer; an extension of a surface National Park and with overwhelming support of landholders within the Gellibrand Groundwater Management Area, this initiative deserves to be given due consideration.

Overwhelming Support.

Over 1,200 people from 297 towns in Victoria have signed a petition in support of the initiative. Public acceptance has been overwhelming in favour of establishing a Subterranean National Park in the Gellibrand Groundwater Management Area.

A Work in Progress.

Appendix One below, has been extracted from Otway Water Book 55 D and includes the contents and introduction of this Book. As explained earlier (page 6) the contents of Book 55 D is a work in progress.

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Appendix One.

CONTENTS. (OTWAY WATER BOOK 55 D.)

Introduction. Page 6.

State Government Pledge of Acknowledgement & Respect to Victorian Traditional Owners. Page 7.

Ministers Busy & Handball Response to DELWP. Pages 7-8.

DELWP Response on Behalf of Ministers. Pages 9-10.

Response a Blinkered Vision. Page 10.

Unique Idea – Colac Herald. Page 11.

ABC News - Unique Idea. Pages 12-15.

Indigenous Support.

- Bruce Pascoe (Indigenous Author). Page 16.
- Richard Collopy (Gulidjan/Gadubanud Rep.) Page 16.
- **** ***** (Eastern Marr). Page 16.
- Angela Jeffrey (Eastern Maar). Page 18.
- Ron Arnold (Indigenous Elder of the Gadubanud People). Page 19.

Other Letters of Support.

- Dr. Sean Maxwell -University of Queensland. Pages 20-21.
- Rosalind Ellinger BA M.Dvt. Page 22.
- Dr. Marina Lewis BA(Hons), MA, PhD. Pages 23-25
- Mr. Martin Ching MB, BS(Adel), BDSc(Melb), LLB(Adel), Grad Dip Legal Rac(LCCL), MDS(Adel), FRACDS(OMS), FACCS, FIAOMS, FAAFPS. Page 26.
- Surf Coast Hinterland Group. Leanne Prestipino. Page 26.
- Princetown Landcare Group Kim Morton. Page 27.
- Page 28.
- SANE (Surfers Appreciating the Natural Environment) Graeme Stockton. Pages 29-30.
- ICON FILMS Harry Marshall (England). Page 31.
- Dr. Joanne Hughson Melbourne University. Page 32.
- Dr. Steve Appleyard University of Western Australia. Page 33-42.
- Environment Geelong Council Joan Lindross. Page 44-45.

- Victorian Piscatorial Council Inc. George Hardwick. Page 47.
- Red Cross. Lake Colac Branch Carolyn Weston (Pres), Pat Dunn (Sect).
 Page 48.
- Geelong & District Anglers Club & Fish Protection Society Inc. Russ Ison Page | 19
 (Sect). Page 49.
- Bellarine Landcare Group Sophie Small (Co-Ordinator) and Dr. Andrea Lindsay PhD (Latrobe), M Agric Sc (Melb), M Env Sc (Monash). Pages 50-56.
- Friends of the Barwon Dr. Kaye Rodden (Pres 2020).
 Associated with:
 - 15 Natural resource Managers.
 - 20 Landcare Groups.
 - 49 Environment Groups, and
 - *33 other groups.* Pages 57-65.
- Association of Geelong and District Angling Clubs Inc. Ian Pickering (Pres) & John Hotchin. Page 66.
- Dr. Yash Ahuja. Page 67.
- OCEAN. Otway Climate Emergency Action Network Lisa Deppler. Page 68.
- "Resolution" Geomorphologist John Modra. Pages 69-70
- Friends of the Earth -Cam Walker. Page 71.
- "Pathways" Doug Frood (Highly respected botanist). Page 72.
- Colac Otway Shire September 2019 May 2021.
 - o Efforts to speak to Councillors through Council officers. 73-74.
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- Dr. Alison Pouliot (World renowned Fungi expert). Pages 82-83
- Country Fire Authority Corangamite Brigades Group (15 CFA Brigades)
 Page 84

INTRODUCTION to Book 55 D.

I find it most intriguing that the Victorian State Governments' environmental laws always appear to be in a minor state of flux. A tweak here and a tweak there. However, very few things appear to change "on the ground" or as some

say "at the coal face.". There always appears to be this reluctance by authorities to do their job. If only the State appointed authorities would administer the rules, regulations, policy and law that already exists there would be little need for further tweakings. Earlier Otway Water Books are packed with examples of this lack of will to implement. Book 10 "Waves of Obfuscation" (November 2009) and Book 17 "Truth, Honesty & Integrity or the Slippery Dance of the State Authorities – Time for a bureaucratic revolution" (April 2012) tell the story of this lack of will.

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There are few examples where a State Government Authority has been proactive and implemented an environmentally responsible action when it has not had to be dragged, kicking, screaming and objecting to actually do its job.

In contrast, included in this book are the letters of support provided by a wide range of people and organisations who can see merit in establishing an Otway Ranges Subterranean National Park, or at the very least sitting down around a table and discussing the proposal.

Here is an initiative that has merit, overwhelming public support and State Government researched scientific data (outlined in Book 55 B) that presents as feasible and relatively simple to implement.

Appendix Two. (also found in Otway Water Book 55 D.)

Alison Pouliot PO Box 101 Daylesford Victoria 3460

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19 April 2021

Dear Madam/Sir

Re: Letter of Support for the proposed Otway Ranges Subterranean National Park.

I submit this letter in support of the proposed Otways Ranges Subterranean National Park.

Otways Forests

Forests comprise some of the most diverse, productive and ecologically significant ecosystems globally. The Otways Forests are among the most functionally critical and biologically diverse forests in Victoria, indeed Australia. Both above-ground and subterranean biota and abiotic properties underpin their critical processes and functions such as nutrient cycling, carbon storage, water filtration and plant productivity.

The Otways Forests also provide large, high quality water catchments. They harbour diverse of biota including many endemic taxa. They store a vast amount of carbon crucial for climate change mitigation. Forest soils constitute vast carbon stocks (more than both vegetation and the atmosphere combined) as well as harbouring diverse microbial communities that mediate critical functions.

While intact forest ecosystems are resilient to some level of disturbance, repeated severe, extensive and intensive disturbance (such as that caused by water extraction, fire and logging) threatens them both directly and indirectly through interactions and feedbacks. Such effects are likely to last for multiple decades and it could take over a century for these forest ecosystems to recover their full functionality and compliment of species following severe disturbance.

Subterranean Ecologies

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Subterranean ecologies are less well understood than those above ground. However, it is well established that the biodiversity of subterranean terrestrial and aquatic habitats is more highly diverse than previously realised. Subterranean environments are represented by microbes, invertebrate and vertebrate fauna. Bacteria, Archaea, Fungi and Protista are known to be nearly ubiquitous in the subterrain. These include surface-dwelling bacteria through to metabolically exotic organisms. All play vital roles in the processing and recycling or organic matter, chemoautotrophy (production of organic matter) as well as the dissolution of rock and mineral deposition.

Moreover, subterranean biota is one of the hardest groups of organisms to protect because they're largely invisible, unknown to most people, and tend not to be the charismatic creatures of most conservation initiatives. While virtually unresearched in Australia, subterranean fauna is believed to be species rich including exceptionally old and relic phyletic lineages, with many having highly restricted ranges. Given the extent of interactions and symbioses between organisms, ecosystem-wide implications are consequently relayed with broader reaching impacts than often realised. The above-ground focused approaches of current forest management practices are likely to be vastly underestimating potential disturbance effects.

Otways Ranges Subterranean National Park

I have been alerted to the damage to both surface and subterranean ecosystems due to groundwater extraction with the Otways, especially within the Groundwater Management Areas of Gellibrand and Gerangamete, by concerned local residents.

The recognition of the 'subterrain' in the Otways Ranges National Park would acknowledge that biodiversity does not end at the soil surface. Every plant (with the exception of epiphytes) has roots in the soil. Fungi have vast expansive and interconnective subterranean mycelia. The soil-subsoil interface of organic matter is recognised as one of the most diverse ecological niches on the planet, second only to that of a tropical reef ecosystems.

The notion of a subterranean National Park is not a new idea, with various already in existence around the world. For example, The Puerto-Princesa Subterranean River National Park was gazetted to protect its karst landscapes recognised as globally significant habitat for biodiversity conservation including eight forest types.

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I note in Grace Mitchell's letter to Malcolm Gardener on 17 October 2019 that she comments 'National Parks are not created for the purpose of managing groundwater'. This may be true of National Parks in Australia in the past (although not elsewhere in the world) and reflects a fundamental underestimation and misunderstanding of the 'thing' we have conveniently labelled as 'groundwater' as somehow separate to a functioning subterranean ecosystem. National Parks globally have been formed for numerous reasons and Australia could set a precedent in amending this oversight that 'groundwater' is solely a 'resource' for Homo sapiens with no consequences from its extraction for other species or ecologies. Australia is known internationally (deservedly or otherwise) for its 'progressive approach' to conservation. Australia could uphold this reputation and show real leadership by recognising the vital inclusion of the subterrain in biodiversity conservation.

Over the last 30 years I have observed and documented the terrestrial and aquatic biota (especially fungi) of the Otway Ranges. My general observation is that the Otways Forest are declining in resilience. Repeated and widespread disturbance such as inappropriate fire management, groundwater extraction, poor forestry practices, insufficient maintenance of human-visited areas such as forest roads, walking tracks and campgrounds, have collectively resulted in extensive spread of weeds (both plants and fungi), loss of valuable older trees and overall reduced health of the forests.

In response to radical increase in human population, climate change, and other environmental destruction, a 'Warning to humanity' manifesto was published in BioScience in 2017. This call reiterated many of the concerns originally expressed by the Union of Concerned Scientists in 1992, in particular, that we are 'pushing Earth's ecosystems beyond their capacities to support the web of life'.

At a time of global climatic and environmental change, with multi-faceted dynamics of disturbance impacts magnified and predicted to increase and intensify, we must adopt a precautionary principle. I urge forest and water managers to practice precautionary, sensitive and informed wholeforest (including the subterrain) approach that must include extensive biodiversity monitoring of both biotic and abiotic ecologies and their interactions. As some of the most intact, oldest and most diverse forest in the state, their functional integrity must be preserved while there is still the possibility to reverse the damage caused by current mismanagement.

Yours faithfully

Dr Alison Pouliot

BSc Hons (Zoology), BA (Philosophy), PhD (Ecology)

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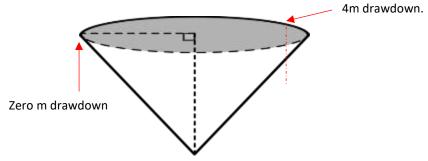
Appendix Three.

Borefield Drawdown Cone of Depression.

Although far from a regular cone shape the impact area from the Barwon Downs

Borefield groundwater drawdown can be described in the following Page | 25 diagrammatic representation.

Accepted surface area of impact out to the 4 m drawdown mark is at least 480km² of surface area.



A 480 square kilometres surface area created by this cone of depression with a 60 m depth, as in the Barwon Downs Borefield example, equates to **2.88 cubic kilometres** of subterranean mass impacted.

Appendix Four.

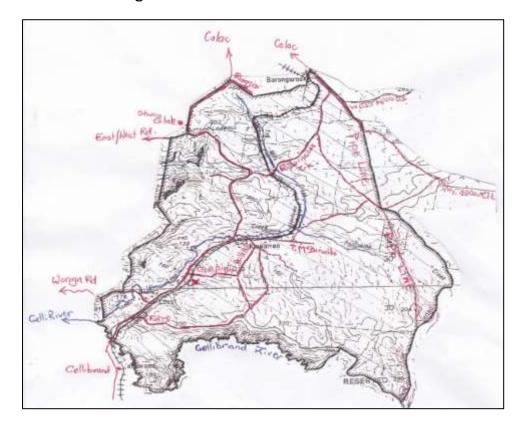


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I am an owner of land

| _ | - + | | | |
|---|------------|--|--|---|
| d | d L | | | _ |

This land is within the boundary of the Gellibrand Groundwater Management Area. As long as my rights concerning this land (marked * on the map) are not altered as a result, I am in favour of the proposal of declaring the Gellibrand Groundwater Management Area as a Subterranean National Park.



| Signature: | · | | |
|------------|---|-------|--|
| Name: | | Date: | |

REFERENCES.

1. A Report from Southern Rural Water's Independent Technical Review Panel tabled at the Southern Rural Water's zoom meeting with the COmmunityb Leadership Group in early 2021 advising on the Remediation of the Big Swamp as per a Section 78 Notice.

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- 2. Pouliot A., 2018: The Allure of Fungi. A CSIRO Publication.
- 3. Pouliot A., May T., May 2021: <u>Wild Mushrooming A Guide for Foragers</u>. A CSIRO Publication.
- 4. Centre for Groundwater Studies, August 2003: <u>ABCs of Groundwater</u>. Centre for Groundwater Studies, sponsored by Natural Heritage Trust and Department of Water Resources, South Australia State Government.
- 5. Evans, Matthew. 2021: <u>Soil the incredible story of what keeps the</u> earth, and us, healthy.