



# Newsletter – Autumn 2021

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Edited by John Edwards

### The inaugural tree-planting day

This was sent by Pat to all of those who are now on our volunteer list, for so readily putting their hands up to help out with the planned koala feed tree planting day at the landmark Lawrence wetland back in mid-February.



“I especially acknowledge those of you who wanted, and planned, to come along, but found yourselves double-booked and lumbered with other family priorities; those who made a decision to pass at the last minute (as I came so close to doing myself) due to a dodgy weather forecast and creeks and rivers that threatened to cut us off, and also to offer my especial thanks to those of you who braved the predicted elements and came along regardless, to help out on what turned out to be a really enjoyable and successful day. It was due to the encouragement and commitment of all of you that together we managed to plant a veritable forest of trees, now growing and making ready to feed many little koala mouths down the track. The additional bonus was that instead of getting the expected saturated clothing and slosly wellies to deal with, the day ended on a jubilant high over a pleasant picnic, a welcome cup of tea, and a sausage sizzle beside the already restoring wetland, with nests filled with brooding birds and tiny chicks eyeing our own antics from the nearby recovering swamp trees.

You all helped with this, one way or another, and other days are on the cards for further plantings in the future, so I promise to let you all know if - and when - this is likely to happen.



Meanwhile we can all feel justifiably proud to be able to be involved and able to play a small part in the restoration of this remarkable sanctuary, which has been through some tough times of late with no one to look after it.

Our sincere congratulations especially go to Elizabeth and Neville for daring to purchase the place with its full restoration in mind, and protection of this famous egret colony for the Clarence Valley community to enjoy and marvel at into the future.

You are all champions. Thank you, from us, for the birds, and the healthy koalas now gradually arriving in increasing numbers into the Lawrence river surrounds. The place is soon about to look incredible.

Pat



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### **More on the politics of climate change**

In our quest to combat climate change, it seems that political philosophy and denial, spurred on by vested interests, are our greatest impediment to successfully avoiding an unmanageable outcome. Two weeks ago, the United Nations Secretary-General, Antonio Guterres warned that the planet is on track to be 3 to 5 degrees warmer within 80 years, that's more than double the warming that scientists believe we can safely endure.



In fact, it is now predicted that the manageable 1.5-degree maximum warming could be reached as early as 2024, after which, continued inaction will most likely have catastrophic consequences.

With this dire warning front and foremost, one would think there would be some degree of urgency to address the situation, but no, instead, some Australian politicians are advocating for Clean Energy Finance Corporation money to be used to fund new coal-fired power stations, arguably the greatest source of greenhouse gas emissions.

On the other side of the equation, forests across the globe, one of nature's most efficient carbon depositories, are being cleared at increasing rates for agriculture, and more recently to be burned to generate electricity. Apparently, the term renewable energy is being manipulated to imply that "renewable" is somehow "clean" and acceptable, and that's given denialists the opportunity to promote the use of 'biomass' here in Australia.

The escalation of biomass use is so great, that a group of over 500 international scientists have written to the Presidents of the US, the European Council, the European Commission, and South Korea, as well as the Prime Minister of Japan, asking them to intervene to end the practice of burning wood for energy at an industrial scale. They rightly argue that the practice is seriously undermining efforts not only to address climate change, but to protect biodiversity as well.

Native forest timbers are already being burned to produce electricity here in Australia, although not yet at the industrial scale currently occurring overseas. However, Australian forest timber is also being exported as biomass, in the form of 'biopellets', to countries such as Japan where it is used to generate electricity. The insanity continues!

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## Helping build the bank of scientific knowledge

Over the 32 years that the Clarence Environment Centre has been active in the Valley, our organisation has built an impressive bank of ecological data. This began as far back as 1990 with our Clarence Valley Rainforest Remnants Rescue (Stage I Inventory 1991), funded from the 'Save The Bush Grant' scheme. That project identified and described 39 important rainforest remnants across the district and resulted in the publication of comprehensive details pertaining to all those remnants (Gilmore and Helman (1991)), which is frequently referenced and still relevant today.

The Shannon Creek dam proposal, with its initial pathetically inadequate Species Impact Statement (SOS) in the late 1990s, allowed the Centre's botanists to further expand that database of knowledge. New range extensions of highly endangered species, and even new species altogether were discovered during the process of discrediting that document.

Ultimately, that additional knowledge forced a complete rewrite of the SOS, which took into consideration no less than a dozen additional threatened flora, and enabled us to successfully lobby for over 1,500ha of compensatory habitat which is now protected.



*Boronia hapalophylla*, a new species discovered during investigations into the Shannon Creek dam proposal.



*Tawny Frogmouth*

The 2014 Upper Coldstream Biodiversity project which, in partnership with the Nature Conservation Council, saw our volunteer bush regeneration team transformed into the professional unit it is today, again provided an opportunity to build that knowledge base. With access to more than 60 properties in the Upper Coldstream, Pillar Valley area, our volunteer botanists and field assistants were able to conduct surveys, for fauna as well as flora,

across the area as a part of that project.

Ultimately, that resulted in our identifying over 1,000 native plant species, and more than 200 animals and birds. I should explain that some of the fauna work was undertaken by paid professionals. Clarence Valley Birdoes were also active, and provided their Pillar Valley bird list, which was an invaluable contribution.

That wealth of knowledge has resulted in two of our members, Fig Forest and myself, being invited onto the flora experts' panel which advises the Department of Environment's Saving our Species team. That in turn has seen the Department coming to the Environment Centre, not just for advice and information, but active research on their behalf.

Fig in particular, whose knowledge and experience far transcends botany, and the above projects, has been inundated with work, reviewing conservation plans, and undertaking surveys for various data-deficient species, including the endangered Rat's-tail Fern and Coastal Petaltail Dragonfly.

In recent months, the Environment Department has also approached the Centre, asking us to identify populations of Square-stemmed Spikerush, Lemon-scented Grass, and *Grevillea beadleana*, all endangered species. This is to assist the Department's Saving our Species team to identify suitable seed-collecting sites, sites that require funding for management actions to protect the species, and in the case of the Grevillea, to guide National Parks' staff to the two last remaining adult specimens, so that plant material can be taken for propagation to ensure the species' survival.

While genetic testing of the Grevilleas, which occur on Chambigne Nature Reserve, has yet to be done, there is a consensus of scientific opinion that this population is a different species to that which occurs at higher altitudes along the Great Dividing Range. With just 2 mature plants and 3 tiny seedlings remaining, this is a last-ditch effort to save the species from extinction, and the on-going monitoring of the population by Clarence Environment Centre volunteers, may have been crucial to saving the species.

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### **Dirty water**

There's nothing like a bit of murkiness in our tap water to have rate-payers up in arms. In fact, only recently, heavy rains caused the usual "turbidity", a term used by those wishing to down-play concerns over muddy water, which led to councillors quizzing their water manager over the issue.

Of course, the tendency is to blame the filtration system, or in Grafton's case, the lack of. However, while the installation of a decent, albeit expensive, filtration plant might be desirable, the council, state government and the community really need to act to address the source of the problem, and all of us have a role to play.

Each year, an estimated 24 billion tonnes of fertile soil are lost due to erosion worldwide. That's 3.4 tonnes lost every year for every person on the planet. It's all very well to attempt to shrug off river turbidity as a natural result of heavy rain, but it's simply not the case, there are widespread activities that are causing this problem.



***The Orara River after heavy rain. Many thousands of tonnes of soil is lost from along that river system every time it rains.***

The Environment Centre has identified clear-felling of plantation timbers by Forest Corporation and the former Forests NSW, as a major problem locally. This activity, involving 'ripping', a deep form of cultivation, with no erosion control in place, directly impacts our regional water supply. Even normal state forest logging regulations have recently seen buffer zones along all creeks gullies and drainage lines halved. Those buffer zones were specifically put in place to lessen erosion, and to compound the problem, many state forests are leased out for grazing by cattle.



**Dundoo Creek next to a blueberry farm**

Then there is intensive horticulture (blueberries etc), with the Inter-agency Blueberry Advisory Committee identifying that erosion control across the board was virtually non-existent! That was over 5 years ago, yet the first heavy rain of this last season saw the Orara River turn into something resembling cream of chicken soup, and the industry must accept a share of the blame for this.

As well, a large percentage of the privately owned land in the valley is used for grazing, all criss-crossed by thousands of

kilometres of rivers, creeks, and gully lines, with barely any of them fenced. Cattle grazing of creek banks is hugely damaging, loosening the naturally fragile soils, destroying the vegetation that should be binding those soils, so that when storms arrive, the banks simply disintegrate and are washed away.

I recorded some horrific erosion events during the 4 years it took to build the new Pacific Highway across the valley, and every development contributes to the decline in water quality.

And I haven't even started on wake boating and water skiing

At the height of the 'wet' in February, we were doing some work on a property at Billy's Creek where a local creek was in flood, the area had escaped the bush fires and because the creek bank vegetation was intact, that water was crystal clear. It's as simple as that.

As I said, this is a problem that concerns us all and to which we all contribute to a lesser or greater degree.

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### **Are these stalactites, or 'living' rock like stromatolites?**

On occasions I've come across what appear to be stalactites, hanging from the rooves of sandstone rock shelters in our local area (see image at right). One person I'd asked even suggested they were 'living' organisms, formed by bacteria.



So, as they weren't in limestone caves where stalactites are commonly found, I sent this image to the Australian Museum in Sydney. They run a wonderful free information service called Search and Discover, where anyone can send in photographs of animals, insects, fossils, shells, etc, and their team identifies them for you.

Anyway, as always, the museum responded with the following advice:

***"We have been studying these kinds of stalactites which form under rock overhangs, where there is no limestone. The rock does look like a sandstone/conglomerate.***

*I think groundwater dissolves out calcium carbonate (calcite) scattered in the rock itself or calcium carbonate is carried in solution from elsewhere, and it just seeps out, loses carbon dioxide (mostly by evaporation) and forms stalactites.*

*This is common in some parts of the Blue Mountains and Sydney Basin too. From our work, the calcium carbonate stalactites may have a small magnesium content, and some may be the aragonite form of calcium carbonate as well as calcite.*

*Sometimes some blue-green algae can get involved too, and forms stromatolites – layered calcium carbonate/clay & silt sediment structures. I can only see a little green colouring in the images.”*

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### **Another government scheme that’s bound to be rorted!**

Local Land Services (LLS) is looking for tracts of cleared land, private and public apparently, where they can fund the planting of trees for carbon storage, which sounds like a very positive idea.

One of the LLS officers was briefing us about it, asking us to identify possible properties where these initiatives could take place. However, while he was speaking, I was reflecting on all the Dunn’s White Gum plantations that were part of the Howard Government's scheme back around 2003, involving managed investment schemes. Those were a disaster, and those plantations are still being bulldozed today, after all the companies involved went bankrupt.

Many of those plantations were established on land that already had up to 15-year-old regrowth, old-growth paddock trees, and remnant forest less than 1 hectare, that were flattened to make way for the "efficient management" of the plantations. Will this latest proposal end up being similarly rorted?



**20ha of timber plantation, bulldozed to establish blueberries at Lanitza**

A recent land-clearing episode at Lanitza came to mind, where blueberry growers have recently cleared what I think was a plantation that I'm still in the process of investigating that (see image at right).

The Bawden’s Bridge blueberry venture that's appears to have collapsed leaving over 200ha covered with disintegrating plastic and weeds (see before & after images on the next page).

So, I was left wondering if those landowners can now cash in on their environmental vandalism under this new scheme and get paid to clean up their mess. Either way, I fear this new money will attract the same old ‘shonks’ who will ultimately make a lot of money while others, and more importantly the environment, will miss out.



*Just a small part of the more than 200ha of land now under plastic, and today looking like this.*

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## Giving Dry Rainforest a helping hand

Thanks to a \$300,000 grant from the NSW Biodiversity Conservation Trust, the Clarence Environment Centre is now into the third year of a 5-year bush regeneration project. The work is being undertaken across the western portion of Chambigne Nature Reserve, Council land west of Shannon Creek, and adjoining private property.

More than a dozen gullies containing dry rainforest remnants were initially identified through on-ground surveys, and from these, seven priority sites were selected for weed eradication work.

One of those sites lies within the Chambigne Nature Reserve and incorporates 4 kilometres of creeks and gullies that form the headwaters of Deep Creek, and containing dry rainforest. Last year, the team worked the lower reaches, removing mainly Lantana and Senna, and are now progressing up-slope into very rugged country.

The Centre's work has included comprehensive flora surveys of all work sites, and early on we identified numerous sub-populations of endangered *Phyllanthus microcladus* (Brush Sauropus) at the Deep Creek site.



That species is already being site-managed in the area under the Saving our Species program (SOS), though not at this particular site.

We also identified the endangered Brown Butterfly Orchid (*Sarcophilus dilatatus*), a species that has now been investigated for possible site management under the SOS program (see image at left). As this population was only the 3rd found in NSW, it is a strong candidate for additional funding.

Early flora and weed surveys identified a large remnant, possibly measuring more than 15-hectares of healthy Dry Rainforest growing in the deep valleys of those upper tributaries, which fortunately was spared the 2019 bushfires (see shaded areas on the map below).



**The latest acquisition to the Chambigne Nature Reserve includes a number of rainforest remnants, the largest and healthiest of which is the area shaded yellow-green above.**

In March, our botanists conducted a comprehensive flora survey of that area, finding yet another endangered species growing there, *Tinospora smilacina*, a woody vine (see photograph below right). A number of specimens were recorded scattered throughout, along with two more sub-populations of *Phyllanthus microcladus*, all of which have now been officially atlassed.



***Phyllanthus microcladus***



***Tinospora smilacina***

The rainforest, whilst being a form of Dry Rainforest, is also referred to as the Endangered Ecological Community listing of Subtropical Rainforest, and may also align with the Federal listing. Described also as "Community 348 (*Vegetation Community Profiles, OEH 2012*), Small-leaved Tuckerroo - Red Kamala dry rainforest with emergent Hoop Pine and Steel Box on the northern hinterland ranges", it is one of the few examples of rainforest where there are *Eucalypt* emergents. In this case it is Steel Box (*Eucalyptus rummeryi*) which seems to prefer to grow within rainforest in the local area.

Weed eradication, using splatter technique, has begun around the periphery where denser infestations of Lantana have been identified, while cut-and-paint work has been started within the rainforest itself.

This has been an exciting period for our project team, made so by the discovery of such a significant rainforest remnant that has been spared, so far at least, from the ravages of fire. However, we cannot stress enough the importance of protecting these remaining rainforest remnants from fire. The reason for that is clear when examining other gully lines nearby, which clearly once supported rainforest, but are now little more than eroded 'drains' as a direct result of continuous burning.



The project still has two and a half years to run, after which we are hoping to attract further funding to rehabilitate more of these threatened communities.

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### **LAWRENCE EGRET WETLAND, BEING RESTORED AS LAND FOR WILDLIFE**

Early on Saturday 24 April a group of volunteers, convened by the Clarence Environment Centre with help by Valley Volunteers, set to work to revegetate the landmark egret wetland on Rutland Street at Lawrence.

Once an iconic local attraction filled with noisy nesting and foraging waterbirds, the wetland for several years suffered from prolonged nutrient and chemical runoff through cattle grazing and surrounding urban development. This led to dieback of instream trees, invasion by exotic water hyacinth, and a large fall in the number of birds trying to use their traditional habitat.

Then in 2019 the wetland was bought by a local Lawrence couple, including many subdivided plots around the water's edge that could never be built on. Since then, Neville Watson and Elizabeth Parker have been replanting hundreds of swampland trees and shrubs around the riparian zone, as well as starting the massive task of eradicating the mat of hyacinth weed.

It didn't take long for the health of the wetland to visibly improve, and last year some regrowth of the swamp trees saw hundreds of cormorants, egrets, pelicans and spoonbills return to nest and raise their chicks.



In January the owners approached the Clarence Environment Centre to have the wetland registered as Land for Wildlife, which the CEC delivers regionally to the Clarence Valley. This quickly led to an arranged planting bee to help with the wetland's restoration, and in February a group of volunteers planted 250 koala feed trees, collected from various private and donor commercial nurseries with assistance through the CEC's Land for Wildlife funding reserves. With timely additional rainfall these trees came along in leaps and bounds. Then the follow-up planting bee last weekend saw a further 423 assorted dry rainforest and swampland species in gullies and identified sites, setting the wetland up with as near as possible its full complement of original vegetation communities.

The CEC extends sincere gratitude to the landowners for enabling this work to happen, and to their wonderful volunteers, who worked non-stop for 3 hours in the sun with a sausage sizzle in payment for their willing help.

Thanks also go to DPIE for the donation of additional eucalypts provided under the NSW Koala Strategy, specifically to help restore koala habitat. Unfortunately, through a late order that delivery could not be filled to suit the veg communities, so only half could be used on site, with the others to go to where they naturally occur and will do better.

From Dec 2020 to April 21, again through small donations from their LfW fund, the CEC also successfully distributed a further 1,264 koala trees to 18 Land for Wildlife properties across the Valley, with a focus on those properties damaged by bushfires.

The CEC would like to emphasise that this work has all been in association with, and adds to, the great work being achieved by the recently formed Clarence Valley Koala Working Group. The CVKWG is made up of a number of authorities, organisations and individuals who have come together to pool their resources, knowledge and enthusiasm to ensure a healthy koala population in- perpetuity within the Clarence Valley.

Patricia Edwards (*CEC Vice president; Land for Wildlife Regional Coordinator*) April 2021

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## Bushfire hazard reduction - ‘No quick fixes’ for bushfire crisis

Yet another study has just been released which confirms that hazard reduction burning provides little or no protection against bushfires during periods of extreme fire danger, such as those experienced in spring – summer 2019.

The Sydney Morning Herald summarised the report, that was published in *Nature Ecology & Evolution* journal, as follows:

*“Weather conditions were so extreme and landscapes so dry during the Black Summer bushfires that normal fire mitigation practices such as forestry management and hazard reduction burns had little effect. The fires ripped through landscapes with similar ferocity whether they were national parks, state forests or privately held land.”*

*“When the weather is really bad, all bets are off,” said Professor Ross Bradstock, one of the report’s authors, adding that the adage “you can’t control the weather but you can control the fuel” was blown away by the intensity of the fires. Professor David Bowman, the paper’s lead author, said: “Our research is deeply concerning because it signals that there are no quick fixes to the ongoing fire crisis that is afflicting Australia and other flammable landscapes globally.”*

*The researchers used satellite data to assess three regions in NSW and Victoria covering about 2.35 million hectares, about a third of the area burnt. The research adds to the conclusions of last year’s NSW bushfire inquiry, which found fuel loads going into the fire season were no higher than the average during the previous 30 years. Professor Bowman said climate change, which increases the risk of severe droughts and extreme weather, “frames the whole thing”.*

One thing that I have personally observed is that relatively intact old-growth forest remnants survived the fires far better than younger regrowth forests. It would be great to have research conducted into whether that is the case across the wider fire-impacted areas of NSW.

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## Council keen to protect a significant rainforest remnant at Lawrence

When working at the Lawrence Egret Colony site recently, we observed what appeared to be a patch of healthy dry rainforest on the slope above the wetland. Venturing into the remnant, it was clear that it was in dire need of attention, with exotic weeds, mainly Coral Berry,



The distinctive bark of *Sesamoides elliptica*, or Corky Milk Vine

completely covering the floor of the forest, while invasive climbers including Cat’s-claw Creeper and Morning Glory also threatening the forest structure.

However, amidst the weeds we discovered some gems, several specimens of endangered Brush Sauropus, a rare occurrence of Corky Milk Vine, which is probably a southern extension of its known range. The canopy has a wide range of rainforest species such as Foambark, Silky Oak, Australian Teak, and Python Tree.

Further investigation revealed that the remnant was on a crown road reserve, managed by Clarence Valley Council. The good thing is that the easement, which was likely surveyed well over 100 years ago, is never likely to be needed.



The beautifully patterned bark and glossy green leaves of the Python Tree, are a stand-out feature in the forest remnant

Council's management was more than happy for me to instruct their weed team on what species needed to be specifically protected, so hopefully the work will be carried out safely.

The Coral Berry has invaded much of the forest floor, but while it is highly invasive, it is easily pulled up, and something the residents can deal with. The trick is to remove the weed before it flowers and drops seed, and continue to do that until the soil seed bank is exhausted.

So, we contacted a couple of neighbouring householders who enthusiastically embraced the idea of undertaking some responsibility for maintenance of the remnant in the form of a working group. Council too has come to the party with a promise to use its weed team to 'break the back' of the weed problem, by ridding the plot of the exotic vines.



Coral Berry is highly invasive but easily pulled up

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### **A great leap forward towards ridding the valley from the threat of mining**

A few days ago, our Clarence Catchment Alliance subcommittee presented three boxes containing about 10,400 signatures on our "No Mines" petition to Catherine Cusack, MLC.

The ceremony took place at the Lawrence Hall on Friday 7<sup>th</sup> May, and Ms Cusack graciously accepted the responsibility of presenting the petition in the NSW Upper House the following week. The issue will then be debated, so it is now incumbent on our committee to brief other politicians who are willing to support our cause.

The outstanding success of the campaign to date is testament to the dedication and hard work put in by our management team, who deserve our gratitude and support.

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### **Clarence Environment Centre hosts a nature walk for Lions Club Clarence Environmental**

Intermittent showers on the day of the Lion's Club picnic day at Shannon Creek on 2 May did not disrupt the enjoyment of a nature walk, led by Clarence Environment Centre's John Edwards

For 44 years John and I have lived near Shannon Creek, with the rugged sandstone landscape as our back yard. Because of this, and the area's isolation, we can proudly claim to be responsible for identifying virtually every plant species that occurs within a ten km radius of our home. By this study, and also John's ongoing work around the Clarence, linked with his remarkable bush skills, he was the obvious person for the Lions Club to invite to head their walk.

The first thing the group asked to see was the Endangered Shannon Creek Boronia (*Boronia hapalophylla* - Edwards/Edwards/ Duretto). This striking little shrub is easily spotted in the bush by its year-round flowering habit, but is also recognisable by the strong scent given out by its leaves. This became evident when every person in the 20-strong group could easily pick up the not unpleasant odour permeating from a single crushed leaf.



*Shannon Creek's Jurassic landscape*

John gave them a hands-on demonstration of how the steep sandstone ridges act like a sponge, sopping up rainfall then gradually filtering it downwards to sustain the diversity of plant life, which seemingly exists in an arid rocky landscape without a drop of moisture. This demonstration was also used during the early design phase of the Shannon Creek dam, to explain concerns about the highly porous nature of the rock and how soft and friable it becomes when saturated.

John also spoke about the large number of plant species that exist nowhere in the world except at Shannon Creek, and explained how a substantial number were recorded as official range extensions by the Sydney Herbarium, so considerably adding to the knowledge of the Clarence Valley's flora values.

It was also exciting at that time to have a number of our finds accepted as threatened species by the NSW Scientific Committee, following our nominations for this status. The Boronia was one of these species.

A unique Brown Bloodwood-Sandstone mahogany tree combination was also pointed out to the group, as were the endangered Brush-tailed rock-wallabies that inhabit the numerous sandstone caves in the vicinity, and the bushwalkers were even treated to a taste-test of certain bush tucker species as they made their way across the rocky slopes.



Local knowledge, however, became most pronounced when John led the climbers onto an historic dray track, cut along the ridge by early settlers to Shannon Creek at the end of the 19th century. The historic “cutting” (left and below) was known to the then landowner when first ‘rediscovered’, but otherwise unsuspected. At that time we were researching family histories for the History of Coutts Crossing & Nymboida Districts (CCND Historical Society 1986), so it was good to be able to make its existence publicly known, as well as its history. This successfully ensured its protection by the Dept of Commerce and NC Water during construction of the Shannon Creek dam – a status that remains in place today.



The Clarence Environment Centre strongly supports the work of the

recently formed Clarence Valley Lions Club Environmental arm, and thanks the Committee for this opportunity to help pass on some important local knowledge.

We also extend our personal warm gratitude to the Lions club Committee for the unexpected quality gifts presented to John and I at the day’s end. This generous gesture was entirely unnecessary, but nevertheless has been sincerely appreciated and enjoyed.

Pat

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### **Answering the critics**



Following the reporting of the hand-over to State Government of the 10,000-signature petition against mining in the Clarence River catchment, there has been some criticism voiced in the media. This has been levelled mostly against Council for making the decision to call on the state government to place an embargo on mining in the valley, without consulting the public.

While the 3 year-long campaign by the Clarence Catchment Alliance, which resulted in the 10,000 signatures, could well be seen as a clear indication of the community’s feelings on the subject, we should not lose sight of Council’s responsibilities.

One of their foremost responsibilities is to ensure safe drinking water to the residents of, not only the Clarence Valley, but also those living in the Coffs Harbour local government area.

So, when Queensland minerals explorer, Chris Wilson Investments, applied for a licence to drill in search of gold and silver across a 198 square kilometre lease just west of Glenreagh, which straddled the Nymboida and Little Nymboida Rivers, Council took notice. The reason for that was the fact that those 2 waterways provide all the water flowing into the Nymboida Weir, the source of all water for the Coffs Harbour Regional Water Supply.

Remarkably, Council only learned of this application via Facebook, and was never formally asked by either the proponent, or the Department of Planning, if it had any objection.

Anchor Resources has been drilling across the Dorrigo Plateau for more than a decade, but focusing on searching for Antimony at Beilsdown River, 12km from Dorrigo, and Gold at Blicks River, near Tyringham. Both of those rivers are major tributaries of the Nymboida.

To the west of Grafton, we have the Clarence Gorge, just below the confluence of the Upper Clarence River, which drains from the Queensland Border in the north, and the Mann River, which contains flows from numerous “wild Rivers”, including the Nymboida, which drain an enormous catchment to the south. Along a section of that river system above the Gorge, across mountainous areas of extreme scenic beauty, three other exploration companies are at various stages of drilling operations, focussed on finding copper and cobalt.

The terrain across which all those mining leases stretch, is some of the steepest and most rugged in the state, and is also one of the wettest, two factors that combine to create a high risk of spillage from toxic waste dams at mine sites. With all of those minerals being highly toxic, or involve the use of toxic substances during the extraction processes, is it any wonder Council is worried.

When community groups raised concerns about those risks, they were met with indifference from their elected representatives, as was Clarence Valley Council when it requested the embargo. According to those responses, there is no risk because the work is only exploratory, only drilling a few holes.

The reality is however, that when the local environment centre alleged that one operator was in breach of its licence, the Resources Regulator investigated. That investigation confirmed the allegations, resulting in the suspension of both that company’s exploration licences for six months while a clean-up was undertaken. The company claims that work cost them \$300,000 dollars, and were also made to pay close to another \$100,000 in penalties and costs to the Regulator. All that happened **before** any extraction work began.

There are already waterways in the Northern Rivers, and across all of the country, that have experienced mining disasters, that are now permanently contaminated, a fact downplayed by politicians as historical, and couldn’t happen today. That claim is contradicted in the 2017 Academy of Technology and Engineering’s (AT&E) 2017 report; ***“Addressing the environmental impacts of Australian mining’s past and future”***.

That report identifies that: ***“Mining poses a variety of environmental risks, including potential impacts on ground and surface water quantity and quality, air quality, biodiversity, landscape stability and climate change”***.

It then goes on to say that while Australia's mining sector has the skill, technology and motivation necessary to manage and mitigate these risks, ***“examples of significant environmental impact still occur.”***

A simple internet search, focusing only on copper mines, reveals the following environmental disasters (see also attached), confirming the AT&E's assertion:

- Baal Gammon copper mine disaster in Queensland, 2018
- In late January 2013, ex-cyclone Oswald forced around 20 mines across Queensland to dump waste water into passing floods. Many reasoned that the high volume of water passing through river systems would dilute any contaminants to safe levels.
- Lady Annie Copper Mine disaster, 2009. (Published in Anthropocene).
- Redbank copper mine disaster, historical to 2000.
- Mt Oxide copper mine disaster, 2009

There are always environmental risks associated with mining, and no matter how robust the imposed conditions are, accidents will continue to occur, even here in Australia, and those risks are enhanced by factors such as very steep terrain, high rainfall and unstable soils. All of those apply to the Clarence River catchment.

Well over 100,000 people depend on the catchment for drinking water. Irrigators, commercial and recreational fishers, tourism, other agribusiness and more, all depend on that water. The entire river system also holds enormous spiritual significance to the valley's three first nations peoples. There are protected wild rivers, world heritage areas, and national parks. All this is too precious to risk, and clearly more than 10,000 people agree.

Under those circumstances we believe Clarence Valley Council acted responsibly and appropriately when requesting an embargo be placed on all mining activities in the Clarence River Catchment.

To top it off, the region is also recognised worldwide as a biodiversity hotspot, both on land and in the marine environment. It is all too precious to risk

