



An analysis of Council's nature playground proposal for Murray's Reserve and the LACA alternative

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Illustration 1: Murray's Road and adjacent Subtropical lowland rainforest containing *Gossia gonoclada*

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Introduction

Once believed to be extinct, the only known natural community of the endangered tree *Gossia gonoclada* left in the world was re-discovered in the late 1980s along the banks of Slacks Creek on Murray's farm and in what is now Murray's Reserve. This community numbers around 50 plants, making it one of Australia's rarest trees. It is listed as 'endangered' under the Federal EPBC Act.

Within Murray's Reserve 75 rainforest flora species including *Gossia gonoclada* form an important patch of subtropical lowland rainforest partially buffered by other ecosystem types within and beyond the Reserve. Subtropical lowland rainforest only occurs in Australia between Grafton NSW and Maryborough Qld. Because ninety two per cent of it has been cleared since settlement, Sub tropical lowland rainforest is listed as critically endangered under the Federal EPBC Act.

Australia has a very poor record when it comes to protecting our native plants and animals, losing more mammal and plant species over the past 200 years than any other country. The International Union for the Conservation of Nature (IUCN) Red List now puts Australia in the top five nations for extinction of animal and plant species, and the top 10 for the number of species currently in danger of extinction. (1)

Clearly, Australian governments have failed to provide adequate protection of the habitat of the country's most endangered species, with 90% of the 120 most endangered animals having few safeguards around loss of their habitats. Recovery plans, with the best intentions, consistently fail in practice to provide genuine measures to limit habitat loss. Indeed it can be argued that, due to the failure to protect habitat in any realistic way, successive governments at all levels are unwittingly helping to entrench the process of extinction across our landscape.

It is with these considerations in mind that LACA believes Council's '**nature playground**' proposal for Murray's Reserve is in need of further consideration with respect to whether, in its current location, it is really compatible with the primary aims of the Reserve, which are to provide adequate protection of the endangered species/plant community on the site.

To help inform this process LACA has prepared the following submission which analyses the Council proposal and puts forward an alternative aimed at strengthening the Murray's Reserve habitat while still providing for significant community outcomes in this unique part of Logan City.

1. An analysis of the Council proposal:



Illustration 2: Council concepts for the nature play area

1.1 The nature play concept

The current Council initiated proposal is for the installation of playground elements consisting of rope bridges, 'playhouses', timber stepping blocks, a hammock swing and climbing logs. Nature play, according to a South Australian government website, is an institutional response to *'Increasing urbanisation and smaller backyards (which) have significantly reduced children's daily contact with the natural environment and their connection with it'*. (2)

Most nature play infrastructure proposals are aimed at rebuilding institutional play spaces, such as pre-school play grounds and formal park areas, rather than already natural spaces like Murray's Reserve, where they would tend to be poor imitations of the genuine natural experiences already present.

In Council's Murray's Reserve proposal, genuine childhood nature play experiences would be compromised by the visible presence and noise of the nearby highway and adjacent urban infrastructure. This problem would be exacerbated in the future with the construction of the DTMR service road almost on top of the proposed nature playground.

Nature play apparatus in the artificial environments of schools and formal parks can act as a useful development pathway towards childhood concern for the natural world and the experiences it offers. However, LACA believes Council's proposal – to locate the nature play equipment in Murray's Reserve in an area which is largely disturbed, close to the highway and expanding urban infrastructure - diminishes the value of the play area as a place for childhood learning about the importance of nature. LACA believes there is no compelling argument for an artificial nature play experience in the site Council has selected.

LACA's proposal, on the other hand, enhances the integrity of the Reserve through increased buffering and fauna/flora security while offering a more genuine opportunity for childhood immersion in nature and its experiences.

1.2 Educational aims:

The Council proposal, rather than providing for sound environmental learning experiences, would instead deliver the rather distorted message to children that even a small natural area, set aside as a reserve to protect endangered species and plant communities, is fair game for development as a human play space. LACA accepts that in larger areas of very low biodiversity value, human recreation spaces for play, mountain bike and four wheel drive activities for instance, may be appropriate if managed very well. However, Murray's Reserve is far too small and ecologically important to accommodate relatively large, dedicated human recreational spaces within its boundaries. To the contrary, there is compelling need to extend and increase the vegetative buffering in and around Murray's Reserve, in keeping with the stated intent and goals of the various Recovery plans put in place to protect the endangered species and plant communities on site.

1.3 Biodiversity values of Murray's Reserve

Murray's Reserve contains several different plant communities or 'Regional Ecosystems'. Off the edge of Murray's Road in the Reserve's core is an area of Subtropical Lowland Rainforest. This is listed as critically endangered under the Federal EPBC Act. Areas of sclerophyll forest on Sewell hill and open forest and wetland around Slacks Creek serve as minimum buffers for the rainforest, providing some protection against heat, drying winds, wind shear and pest invasion.

Within the Subtropical lowland rainforest patch are specimens of the tree *Gossia gonoclada* listed as endangered under the Federal EPBC Act. Under the Queensland State Nature Conservation Act the subtropical lowland rainforest is recognised as Regional Ecosystem 12.3.1 and listed by the Queensland Department of Environment and Heritage protection as endangered under the Vegetation management Act and as endangered for its Biodiversity status. Murray's Road Reserve has been given further acknowledgement of its importance by being declared a Nature Refuge under the Queensland Nature Conservation Act.

Under its 2015 Planning Scheme, Logan City Council has placed a range of environmental and conservation overlays across the site in recognition of the special vegetation community present and the State and nationally listed tree species. Murray's Reserve is also mapped as a primary Koala area and site of very high biodiversity.

The presence of rainforest fruit pigeons and Bower Birds in Murray's Reserve underscores the importance of small remnant areas of lowland rainforest like this in ensuring the survival of these species and also ensuring that seeds are spread widely to assist plant resilience through the dispersal of genetic material to other locations. Murrays Reserve in its current state provides opportunities for Koala feeding and connectivity to other Koala food areas, however the reserve remains seriously compromised in this respect by Murray's Road which runs through its core.

LACA believes that the Reserve in its current form is manifestly inadequate to provide long term protection for the threatened subtropical lowland rainforest community and the *Gossia gonoclada* trees present.

1.4 Potential environmental impacts of the Council proposed nature play area

1.4.1 Background: At 9.1 hectares, Murray's Reserve is one of Qld's smallest nature refuges. Because the reserve is very small in area, it is more difficult to retain its integrity in the face of impacts (even small impacts are more significant to the whole). Indeed, impacts are increasing through expanding urbanisation and infrastructure adjacent to the refuge, a growing local population, more traffic moving ever faster through Murray's Road, the new threat of Myrtle rust, and climate change with the potential for more severe flooding and drought. This increase in threats should be met with increased protection decisions for the reserve.

1.4.2 Loss of further buffer opportunity for the Reserve. To be consistent with the intent of the threatened species/ecological community recovery plans, the cleared site selected for the nature playground must be revegetated fully, including dense understorey. The need for this is urgent as urban growth and a highway upgrade including a new service road will increase edge effects in the reserve. Due to the surrounding constraints, Murray's Reserve does not have the level of buffer zoning that might be accorded other nature reserves situated in a larger bushland or rural settings. Edge effects include rubbish thrown from cars, dumping, exhaust fumes, noise of vehicles, speed of vehicles, night-time lights interfering with fauna, road kills, road and playground maintenance issues. The Subtropical lowland rainforest recovery plan states 'Fragmentation and the creation of patches with long edges results in physical and biotic changes which have major impacts on the ecology of the remnant. The edges of a remnant are subject to physical effects which include elevated wind turbulence and incursion, temperature variability, lateral light penetration and reduced humidity (Hunter, 1998). These changes in the physical environment of Lowland Rainforest have consequences for the plants and animals which inhabit the remnant.'

1.4.3 Increased human intrusion into the Reserve area. With the best intentions, there is little to prevent children and adults moving through the plant communities adjacent to the playground. This can result in compaction around trees, interference with fauna, trampling of flora, transmission of disease such as Myrtle rust, further rubbish and potential fire risks from discarded cigarettes or 'campfires'. Council maintenance crews may add to these impacts as they clean up vegetated areas adjacent to the playground. The use of herbicides such as glyphosate to control weeds within the playground and its periphery can have serious consequences for the soil, micro-organisms and plants in the adjacent plant

communities, altering soil characteristics and impacting on plant resilience (see notes below on glyphosate). Queensland Government environmental advice for the *Gossia gonoclada* includes: 'human visitation may also be a threat to the long-term survival of the species' (3)

1.4.4 Impact of the proposed boardwalk Ostensibly designed to 'avoid trees', all boardwalks nevertheless impact on natural areas. Roots are affected, understorey vegetation is reduced, many holes are dug and environmentally unfriendly concrete is used for the support posts. To a degree these impacts can reasonably be accommodated in a large reserve. However, in Murray's Reserve, the combined areas of the playground plus boardwalk occupy over 10% of the total reserve area. Furthermore, boardwalks are typically made using CCA treated timber. University of Newcastle researcher Sharon Beder has pointed to the problem: 'Stilwell also found that there were elevated levels of copper, chrome and arsenic in the soils below the decks and that the amounts increased with the age of the deck. The average amount of arsenic was 76 mg/kg (138 mg/kg after 8 years) compared with a state safety limit of 10 mg/kg in residential soils. The EWG study found that in "two of five backyards and parks, the soil tested had enough arsenic to qualify as a Superfund site." This means that if it were an industrial site it would be considered hazardous and have to be cleaned up.'

Clearly, the future of the threatened species/plant community in the reserve will depend on maintaining and enhancing the resilience of all reserve species in the face of these increased impacts. The Recovery Plan advice for the *Gossia gonoclada* states 'As so few individuals remain, all areas where the species occur are considered critical and should be protected accordingly...Currently, there are only 12 trees that produce viable seed and cuttings have been collected from nine trees.'

Accordingly, recovery plans for both the *Gossia gonoclada* and Subtropical lowland rainforest call for the maximum possible vegetative buffering to protect the threatened plants/plant community from edge effects and other impacts and thus maintain species' resilience. LACA believes that the 'cleared area' selected for the Council proposal should instead be revegetated to provide much needed additional buffering to the reserve and its threatened species.

2. LACA's alternative proposal:



Illustration 3 The LACA alternative: Murray's Road closed between Rafting Court and the southern boundary of the reserve, revegetated, with walking/cycling track, incorporating nature play elements, still providing access for maintenance and detour purposes (see also illustration 4)

Increasing urban pressures on the very small Murray's Reserve, as outlined above, combined with the emerging effects of climate change demand increased commitment and stronger, science-based decisions to 'future-proof' the endangered plant communities in this unique reserve.

LACA's alternative proposes closing down Murray's Road between Rafting Court and the southern boundary line of the Reserve (see map) and increasing buffer protection of the endangered plant communities by fully revegetating the 'cleared area' at the northern end of the reserve.

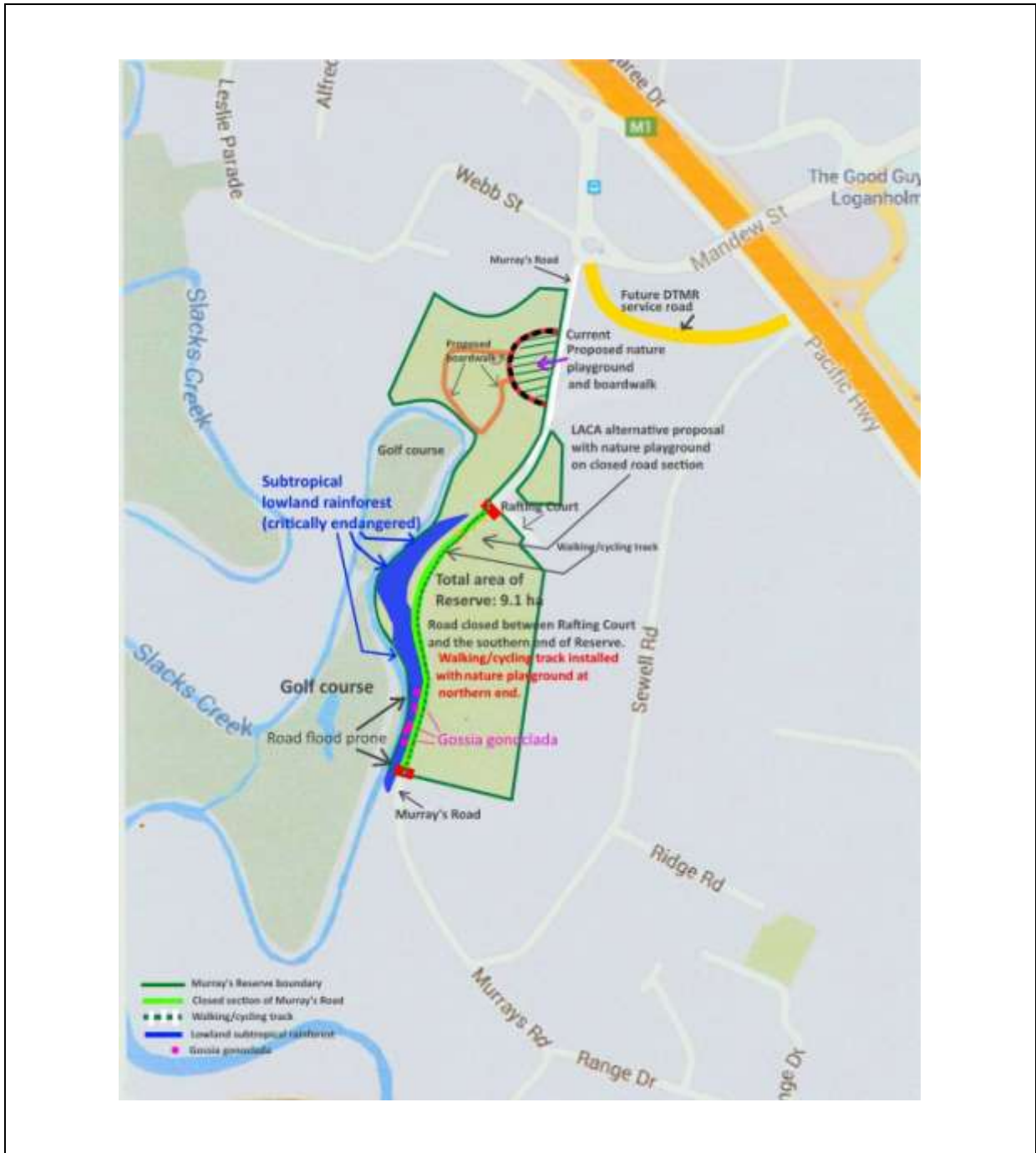


Illustration 4 The two alternative proposals for Murray's Reserve. Note Sewell Road providing the default road access for communities beyond the reserve.

2.1. Murray's Road closure and the LACA alternative

2.1.1 The closed section would be revegetated to incorporate a walking/cycling track. Nature play structures could be incorporated into the northern end of this. Shelters and parking space could be provided just outside the entrance at the Rafting Court end. Information boards could be placed here to draw user's attention to the very significant plant communities present and protected within the reserve. (see map)

2.1.2 The closed road section will not interfere with normal local community access as a recently upgraded adjacent Sewell Road provides for this.

2.1.3 Because the proposed closure is between Rafting Court and the southern boundary of the reserve, no private properties will lose access.

2.1.4 Murray's Road is flood prone.

2.1.5 Bushfire problems are more likely on Murray's Road than Sewell Road

2.1.6 The closed road section would be revegetated but with a walking/cycling track sufficient to allow maintenance vehicles to move through and available as an emergency detour if required.

2.1.7 Current traffic use is small but increasing. Vehicles regularly drive through at speed, creating risks for walkers/cyclists and fauna using the road.

2.1.8 Night passage of vehicles along Murray's Road seriously impacts on the reserve's important fauna through risk of road kill, light pollution and noise.

2.1.9 Currently, Murray's Road severely compromises the reserve, limiting its capacity to sustain the plant/animal associations that are critical to the ecological health of the reserve and its endangered species.

2.1.10 Murray's Road is narrow – effectively down to one lane in places. Future upgrading and widening would be out of the question due to the proximity of the *Gossia gonoclada*, subtropical lowland rainforest and Slacks Creek at the southern end (see map)

2.1.11 Roads, often very heavily used ones, have often been partially closed and re-purposed to allow for other over-riding objectives. This is particularly the case in cities where malls are created on once intensely vehicle oriented city streets. Murray's Road is a former farm track, it is restricted in its width and pedestrian useability. It is subject to flood and fire risk. It severely compromises the integrity of a key reserve dedicated to protect endangered species.

As discussed earlier in this submission, the growing threats to Murray's Reserve require genuine and decisive responses towards increasing buffers in and through the reserve, if the endangered plant communities present are to remain viable. LACA's proposal for revegetating the cleared area at the northern end and closing and revegetating part of Murray's Road, while maintaining community use, are essential steps that must be taken if we are serious about handing this remarkable site down to future generations.

End notes

1. Planting *Gossia* cuttings and seedlings in other sites has not been proven yet. The Murray's Reserve/Murray's farm community remains the key to the future of this species.

Griffith University researcher Tamara Taylor: 'So far I have found that the number of remaining propagated plants is significantly fewer due to mortality caused by prolonged drought followed by the 2011 and 2013 floods in Brisbane and Logan. I have also found a high level of myrtle rust infection on many of the remaining trees.' (4)

2. The protection of ecological communities or species alone will not be effective unless the ecological processes that sustain them are maintained (Bennett et al., 2009). (5)

3. Management practices as edge effects: Effect of Glyphosate on mycorrhizal fungi:

'herbicides significantly decreased root mycorrhization, soil AMF spore biomass, vesicles and propagules'. 'In arable soils AMF are the dominant root symbionts that sustain plant growth'. Mycorrhized plants commonly show a higher uptake of phosphorus and nitrogen, as the fungal mycelium has more efficient mechanisms for absorbing mineral nutrients than roots and by extending the root system enabling further exploration of the soil resources^{5,10,11}. In return, host plants provide photoassimilates (predominantly glucose and fructose) that are converted to lipids by the fungus and used for carbon transport and storage' 'tropical earthworms strong mass loss after glyphosate application was found' 'We found a 40% reduction of mycorrhization after Roundup application in soils amended with the mycorrhizal fungi *G. mosseae*. This is in contrast to what we hypothesized, based on the allegedly fast biodegradation of the herbicide and the very plant-specific mode of action' 'our results show for the first time that Roundup can affect important interactions between earthworms and AMF, two of the most important soil organisms.' (6)

4. Springtails (Collembola) and soil/plant health: 'The soil is a reservoir of organisms ranging from beneficial to deleterious for plants. The interactions among these organisms are very important for plant growth and health. The majority of springtails feed on fungal hyphae or decaying plant material. In the soil, they may influence the growth of mycorrhizae and control fungal diseases of some plants. In tropical rain forests, more than 130 species m⁻² have been found in soil, leaf litter, and aboveground vegetation.' (7)

5. *Gossia gonaclada* trees are susceptible to the myrtle rust disease which has recently entered Australia and which can be transmitted from plant to plant on shoes, hands etc. The capacity of this and other rainforest flora in the Reserve to survive frequent Myrtle rust attacks may be compromised by regular use of glyphosate herbicide used for weed 'management'.

6. Glyphosate effects in general: 'Roundup can increase the spread and severity of plant diseases. Over 40 major plant diseases have been found to increase following use of glyphosate including nine different species of root rot (e.g. *Fusarium* spp, *Phytophthora* spp, *Monosporascus* spp), as well as Anthracnose, wilts and rust diseases. Glyphosate reduces resilience (e.g. cold hardiness, drought tolerance) in trees and their resistance to fungal disease. Damage to non-target trees in woodlands sprayed with Roundup for weed control is greatest 2 years following spray application. Glyphosate used to control weeds under

trees inhibits the trees uptake of essential nutrients including Manganese, Zinc, Iron and Boron, which plants need to fight disease.’ (8)

7. CCA treated logs:

‘Stilwell also found that there were elevated levels of copper, chrome and arsenic in the soils below the decks and that the amounts increased with the age of the deck. The average amount of arsenic was 76 mg/kg (138 mg/kg after 8 years) compared with a state safety limit of 10 mg/kg in residential soils. The EWG study found that in "two of five backyards and parks, the soil tested had enough arsenic to qualify as a Superfund site." This means that if it were an industrial site it would be considered hazardous and have to be cleaned up.’ (9)

8. Importance of beneficial plant associations, mutually supporting plant assemblages and the animal/plant interaction in ecological communities:

‘the clearing and fragmentation of rainforest has changed the population size, distribution, assemblage composition and behaviour of rainforest animals. These changes have implications for the maintenance of biodiversity in remnant forests, for the restoration of forest on degraded land, and for the interaction of rainforests with their surrounding landscapes. Understanding and managing animal-plant interactions in human-dominated, multiple-use, landscapes poses an important challenge for scientists and managers. Significantly, meeting this challenge will require a long-term view.’ (10)

References:

- (1) The International Union for the Conservation of Nature (IUCN) Red List
http://www.iucn.org/about/work/programmes/species/our_work/the_iucn_red_list/
- (2) <http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/education/for-educators/nature-play>
- (3) http://www.ehp.qld.gov.au/wildlife/threatened-species/endangered/endangered-plants/anglestemmed_myrtle.html
- (4) <http://www.wildlife.org.au/projects/researchgrants/gossiagonoclada.html>
- (5) Cited in
<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/101-listing-advice.pdf>
- (6) From 'Nature': <http://www.nature.com/articles/srep05634>
- (7) <http://researchtrend.net/bf22/16%20DEEPMALA.pdf>
- (8) <http://permaculture.com.au/glyphosate-toxicity-impacts-on-the-environment-and-non-target-species/>
- (9) Cited in <https://www.uow.edu.au/~sharonb/cca.html>
- (10) <https://www.griffith.edu.au/environment-planning-architecture/environmental-futures-centre/publications/reports/?a=266154>



Illustration 5 Council's nature playground proposal set in the 'cleared area' at the northern end of the reserve. LACA proposes instead that this should be revegetated to provide additional buffer to the endangered plant communities the reserve is dedicated to protect.

ON behalf of LACA I have attached a detailed submission on the Murray's Reserve nature playground proposal. Given the increasing level of impacts on this tiny reserve, we believe it is absolutely

essential that we enhance the protection of the endangered species in this reserve while at the same time providing for community needs.

As discussed at the recent Saturday consultation meeting, we would very much like to have the opportunity to talk this through further with you.

Best wishes,

Barry Fitzpatrick (LACA spokesperson for the northern catchment)

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