

Public submission

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1. Sustainability of current and future forestry operations in NSW

“Those who cannot remember the past are condemned to repeat it”
George Santayana, undated.

The sustainability of current forestry operations is a consequence of and adds to, the consequences of past operations. From that perspective, the main issue for future forestry operations in NSW would seem to be how long they can be sustained.

The fundamental measurements required to demonstrate forest sustainability are tree regeneration, growth rate and mortality. Survey methods to fit this requirement were developed during the Regional Forest Agreement (RFA) process by the Forest Resources and Management Systems technical committee (FRAMES). Implementation of these methods in NSW was intended to be a legally binding aspect of the Regional Forest Agreements but this didn't happen, seemingly in part because most people prefer to think trees will always grow back.

Among the uncertainties raised by the FRAMES committee in the Eden RFA region¹ were -

- large parts of the regrowth resource (mainly logging regrowth) have not had adequate plot data collected to enable estimation of current stand variables;
- an objective statistical basis for growth predictions for logging regrowth needs to be developed;
- information on the growth of non-silvertop ash dominated forests, (approximately 40% (State Forests to revise) of State Forest) is very limited.
- the level of defect in regrowth sawlogs from fire and logging regrowth needs to be better understood.

Clearfell logging was implemented in Eden in the 1960s due to a perception that previous sawlog removal had created a situation where trees were not regenerating. Industrial clearfell, referred to as integrated logging began in the 1970's with the construction of an export woodchip mill.

A report on the first decade integrated logging at Eden² indicated the region has three working zones, each with it's particular management being -

- Eden • The Silvertop Ash-Stringybark type forests, with a low proportion of non-pulpwood species.
- Bega • The dry mixed-species forests, with a high proportion of non-pulpwood species.
- Bombala • The moister, higher altitude forests: those dominated by *Eucalyptus maidenii* and those in the *E. Fastigata-E. nitens* forest type.

According to the report -

“The current resource will maintain logging for 40 to 45 years from 1970. At the end of that time, 218,000 hectares will be regenerating and available for future hardwood utilisation. Indications are that, at the completion of the current rotation, the regeneration stands will be capable of supplying a sustained yield of pulpwood at current levels, of being manipulated to provide other timber products, or even reverting to uses not related to timber production.”

and

“Soils within the area are poor to medium in nutrient status relative to other N.S.W. forest soils.”

1 Eden Forest Resource and Management System Report (May 1998) - Appendix 8: FRAMES Submission to CRA/RFA steering committee. https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/rfa/regions/nsw-eden/resources/nsw_ed_frm7.pdf

2 Bridges R.G. (1983) Integrated logging and regeneration in the silvertop ash-stringybark forests of the Eden region. Forestry Commission of N.S.W. Wood Technology & Forest Research Division Oratava Ave., West Pennant Hills, 2120

and

“Fire still looms as the dominant factor affecting the timber productivity of the forest stands in the Management Area. The recurrence period for fires similar to the November 1980 wildfire will ultimately determine the productive future of the area.”

The capacity to supply a sustained level of pulplogs and any manipulation (ie. thinning to potentially increase future sawlog production) requires soils that can support tree growth. Reverting to uses not related to timber production does not require soils capable of supporting the growth of commercial forests.

The report provided a cited table³ titled “Nutrient content for soils by parent material types adjusted for stone content. Nitrogen and phosphorus are total estimates, while the cations are exchangeable (Kelly and Turner, 1978).” This research found - “Ordovician marine sediments had the highest nutritional status while the late Tertiary alluvial sediments had the lowest.”

However, and although its release was delayed for a year, soil landscape mapping⁴ published in 1997 found Ordovician marine sediments have several limitations to their productive capacity including a low Cation Exchange Capacity (CEC). Hence while the nutrients may occur, they are generally not in a form available for plants.

Further historic research⁵ on soils in Eden indicated -

“Intensive harvesting of native eucalypt forests is carried out in the Eden area in the south east coastal region of New South Wales, Australia. Soil nutrient capital and nutrient removals in forest harvesting were estimated together with potential impacts of these removals on the nutrient capital balance. Soils were analysed from eighty sites for phosphorus fractions, including organic phosphorus fractions, and total and exchangeable cations. Based on typical forest harvesting systems, it was found that 3–4 kg phosphorus would be removed per hectare. Due to equilibrium between the various soil phosphorus components, depletion would not be solely from the more available pools. It is expected that at least four forest rotations (320 years) would be required before any detectable change would occur, within forest communities. A similar depletion estimate was calculated for the potentially most vulnerable cation, calcium. The other nutrient cations, magnesium and potassium had considerably greater reserves.”

The estimated time frame for the first rotation was 40-45 years or 160-180 years for four rotations. By 1990 it was apparent that eucalyptus regeneration was frequently poor or non-existent in areas logged during the first cycle in Bega working circle.

As part of its move from the then Environment Pollution Licence to a revised Environment Protection Licence for logging operations the NSW in 1996. The Environment Protection Authority (EPA) invited conservation groups on the north and south coast to provide expert input on soils.

Protocol 11: Soil dispersibility, of the Coastal IFOA is a result of the expert input provided by south coast conservationists. The analysis of soils samples in the Murrumbidgee catchment found all were dispersible and this dispersibility increased with soil depth. This soil limitation is associated with a low Calcium content relative to Sodium. Unfortunately the EPA didn't or seemingly still doesn't understand the expert data or the implications for forest productivity. For example Protocol 11 (2) (b) indicates -

“carrying out the soil testing procedure set out in this *protocol* in relation to *aggregates* from each layer of soil that will be *disturbed* by the proposed *forestry operation* within the *operational area*”

This requirement is interpreted as disturbance to the surface layer, rather than changes to sub-soil hydrology to the depth of the tree roots as a consequence of killing the trees. The reduction in soil water holding

3 Kelly, J. and J. Turner (1978). Soil Nutrient - Vegetation Relationships in the Eden Area, N.S. W.: I. Soil Nutrient Survey. *Aust. For.* 41(2): 127-134.

4 Tulau, M. (1997) *Soil Landscapes of the Bega-Goalen Point: 1:100,000 Sheet*, map and report by the NSW Department of Land and Water Conservation, Sydney.

5 Turner, J., Lambert, M.J. (1986) Effects of forest harvesting nutrient removals on soil nutrient reserves. *Oecologia* 70, 140–148 . <https://doi.org/10.1007/BF00377124>

capacity associated with soil dispersion increases the potential for ‘drought-induced hydraulic dysfunction’ and associated dieback⁶. This research refers to citizen science observations indicating “ the current drought in SE Australia is causing significant tree death from the Queensland-NSW border down to Tasmania, emphasising the need to continue research into the thresholds for native tree mortality.” These areas, excluding Tasmania, include most of the suitable habitat for Bell-miners.

Soil dispersion is a chemical process, whereas increased sub-soil water flows is a physical process that moves the dispersed colloidal materials downslope through the soil profile to lower topographies where the Key Threatening Process (KTP), Bell-miner Associated Dieback (BMAD) occurs. However, the NSW Threatened Species Scientific Committee (TSSC), in response to a nomination to list Dieback Associated with Dry Weather and Drought (DADD) with BMAD as a KTP⁷, made a quick decision that DADD is a symptom of BMAD and all other KTPs⁸.

The TSSC indicated “ The Committee has reviewed your nomination in detail and has decided that rather than being a Key Threatening Process this phenomenon represents a symptom of a broad range of Key Threatening Processes and other factors including “natural climate extremes”. And “Of the KTPs already listed by the NSW TSSC there are at least 10 which have an impact on the biotic processes and interactions essential for forest health and have caused a disruption. The Committee go on to suggest 8 KTPs starting with BMAD.

However, the final determination for BMAD⁹ indicates -

“Broad-scale canopy dieback associated with psyllids and Bell Miners usually occurs in disturbed landscapes, and involves interactions between habitat fragmentation, logging, nutrient enrichment, altered fire regimes and weed-invasion (Wardell-Johnson *et al.* 2006). At present, no single cause explains this form of dieback, and it appears that ‘Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners’ cannot be arrested by controlling a single factor.”

The inference being that BMAD is also a symptom of a broad range of Key Threatening Processes and other factors seemingly excluding “natural climate extremes” and Anthropogenic Climate Change.

A reduction in productive capacity is exacerbated with logging and burning and it seems unlikely forests in the Eden region will support unsubsidised forestry operations beyond the first cycle of second rotation logging.

For most the remaining forests subject to regulation under the CIFOA inside the Southeast Corner Bioregion, the reduction in productive capacity to a point below environmental capacity and economic viability seems inevitable.

While fire is likely to be seen as the major reason for this outcome in the Eden region, there is no evidence to confirm the increased potential for intense crown fires, due to a lower water content tree leaves, has or will be considered.

It seems likely that regrowth forests burned during the Border fire will not be suitable for woodchips within the next couple of years due to the degradation of the timber. Any trees that grow back are likely to grow slower and be smaller than trees that grew after the first logging cycle.

6 Belinda Medlyn, Linda Beaumont, David Tissue, Mark Tjoelker, Paul Rymer, Remko Duursma, Brendan Choat, Tony Auld, Martin De Kauwe, Chris Blackman, Ximeng Li, John Baumgartner, Sikdar Rassel (2019) Identifying regions of high drought mortality risk for tree species in NSW Final report to New South Wales, Office of Environment and Heritage. <https://www.climatechange.environment.nsw.gov.au/sites/default/files/2021-06/Risk%20of%20drought%20mortality%20-%20tree%20species%20in%20NSW.PDF>

7 Bertram, R. (2019) Nomination to list Extensive canopy die-back with Bell-miner Associated dieback as a Key Threatening process in NSW. <https://bertramr.wordpress.com/wp-content/uploads/2019/08/daddktp.pdf>

8 Threatened Species Scientific Committee (2019) <https://bertramr.wordpress.com/wp-content/uploads/2019/09/ktp-dadd-nsw-tssc-response-september-2019.pdf>

9 NSW Scientific Committee (2007) Final determination for koalas in the catchments from Wapengo to Dignams Creek. <https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2008-2010/forest-eucalypt-dieback-over-abundant-psyllids-and-bell-miners-key-threatening-process-listing>

2. Environmental and cultural values of forests, including threatened species and Aboriginal cultural heritage values.

In NSW such values are generally managed by the National Parks and Wildlife Service. Much like State Forests there is little information to demonstrate these values are being maintained. Indeed, as alluded to in my response¹⁰ to questions posed in the recent NSW koala strategy review, the evidence infers a culture within the organisation with a preference toward species extinction and further forest degradation. This preference requires management that is not consistent with the NPWS Act.

Within Forestry Corporation's Bega working circle is the Murrah Flora Reserves. The reserves were dedicated in 2016 under the *Forestry Act 2012* for the protection of koalas. Koalas in the area and to the north were nominated as an endangered population in 2001. In its final determination to reject the nomination¹¹ in 2007, the NSW Scientific Committee indicated -

3. The quality of Koala habitat in this area is deteriorating because of multiple factors including extensive canopy dieback, clearing due to rural-residential development and commercial forest harvesting. Koalas currently occur at a low density in southeast NSW including the nominated population area.

In what is described as a 'unique arrangement' the Murrah Flora Reserves are managed by the NPWS. The final working plan for the Murrah Flora Reserves, produced in the same year and month of the TSSC's decision about DADD, refers to koala threats indicating ¹² -

A key threatening process, known as Bell Miner Associated Dieback (BMAD), has been reported on the south coast and although not as prevalent as on the north coast, could represent a serious threat to forest health in the reserves. Overall three Key Threatening Processes, as listed under the Biodiversity Conservation Act are identified as applying to reserves:

- ⌚ Removal of dead wood and dead trees' (NSW SC 2003)
- ⌚ Loss of hollow-bearing trees (NSW SC 2007)
- ⌚ Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners (NSW SC 2008), i.e. BMAD.

Forest condition or 'health' is a complex issue and monitoring of this and its interaction with the conservation programs planned for the reserves is an objective of this working plan.

There is no reference to extensive canopy dieback but the plan goes on to suggest -

"The NSW Chief Scientist reports that the main threats to koala populations such as habitat loss and fragmentation, vehicle strike, dog attack, fire, disease, drought and heatwave, are well known. However, should the higher temperatures and more severe periods of drought predicted for the region (OEH 2016c) occur, additional declines are likely to occur, particularly due to wildfire, degradation of browse quality (Lawler et al. 1997) and defoliation (Jaggers 2004). Changes in other more complex threats such as dieback are less clear."

The last sentence appears to stem in part from confusion created with the term 'defoliation' and referenced to research from State Forests of NSW (Jaggers 2004). The referenced document identified declining forest in the Eden RFA region during a period of DADD and there is no mention of defoliation in the document.

What is not considered is the increased fire danger and contribution to climate change from wilting and browning leaves that can only be observed some time after the leaf water content is below what koalas require. An inability to associate the condition of koala habitat with wilting and browning leaves during periods of dry weather may explain why the NSW government lacks a clearer understanding of more

10 Comment on the NSW Koala Strategy Review - <https://bertramr.wordpress.com/wp-content/uploads/2024/06/koala-strategy-review.pdf>

11 NSW Scientific Committee (2007) Final Determination. <https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2004-2007/koala-phascolarctos-cinereus-rejection-of-endangered-population-listing>

12 Forestry Corporation (2019) https://www.forestrycorporation.com.au/__data/assets/pdf_file/0008/1323728/murrah-flora-reserves-working-plan.PDF

complex threats. While there are significant uncertainties with their estimates of koala numbers, most koala experts agree the species is found in forests growing on relatively fertile soils¹³.

The works program for the Murrah Flora Reserves proposed to -

“Deliver, monitor and evaluate the Murrah components of the landscape fire management strategy with an emphasis on fuel management approaches that do not potentially limit the koala population’s recovery.”

The first large hazard reduction burn was undertaken in an area of Murrah State Forest identified as a ‘core koala area’¹⁴ for the multi million dollar “Corridors and core habitat for koalas on the NSW Far South Coast” project. There have been no reported records of koalas in the area since that time and it was burnt again during the unplanned fire Badja fire in 2020. In 2023 the Coolagolite fire intensively burnt both areas subjected to hazard reduction burns and those burnt in the 2020 fire. The 2023 fire appears to have killed most of the koalas in Murrah SF. For reasons that remain uncertain, the fire extended into Mumbulla SF, burning areas that had not been burned since 1980 and where a female koala had been opportunistically monitored for over two years. There has been no evidence of this koala since that time.

A review¹⁵ of the impacts of various fires on soils in NSW indicated-

“Most of the nutrients in a soil are located in the O horizon and the A horizon. Organic matter is the main source of virtually all the available N and most of the available P and S in terrestrial soils (Flinn *et al.* 1979; DeBano *et al.* 1998) and is an important source of other nutrients, such as ammonium (NH₄⁺), K, Ca, Mg, Cu, Fe, Mn and Zn. Moreover, despite its limited depth range, soil organic matter can provide over 50% of the cation exchange capacity of some forest soils (DeBano *et al.* 1998).”

In Brazil it has been found -

“Soil organic carbon (SOC) can be responsible for more than 80% of the cation exchange capacity (CEC) of highly weathered soils, such as Oxisols and Ultisols.”¹⁶

More recent research in Sweden refers to effective CEC finding -

“Our results demonstrate that, on a pH-class average, in Swiss forest topsoils (<30 cm depth) there is a strong confounding effect of soil organic matter contributing between 35 and 50% to the total CEC eff. In subsoils, soil organic matter has a negligible contribution to CEC eff., and the variation of CEC eff. is associated to the presence of inorganic surfaces such as clay content as well as iron- and aluminum- oxides and hydroxides. At pH > 5.5, between 59 and 83% of subsoil CEC eff. originates from exchangeable calcium, whereas in acidic soils exchangeable aluminum contributes between 21 and 44% of the CEC eff.”¹⁷

The working plan does acknowledge “the dispersible nature of the soils could restrict the capacity for regeneration activity”. Despite this acknowledgement, there is no apparent connection in the NSW government with the reason all three of their known attempts to grow koala feed tree species in the Murrah Flora Reserves over the past 8 years have failed.

The evidence demonstrates that the environmental and cultural values of forests including threatened species and Aboriginal cultural heritage are not being maintained. It is clear that the limited and misrepresented

13 Christine Adams-Hosking, Marissa F. McBride, Greg Baxter, Mark Burgman, Deidre de Villiers, Rodney Kavanagh, Ivan Lawler, Daniel Lunney, Alistair Melzer, Peter Menkhorst, Robyn Molsher, Ben D. Moore, David Phalen, Jonathan R. Rhodes, Charles Todd, Desley Whisson, Clive A. McAlpine (2016) Use of expert knowledge to elicit population trends for the koala (*Phascolarctos cinereus*) <https://doi.org/10.1111/ddi.12400>

14 Corridors and Core Habitat for koalas on the NSW Far South Coast (2011) Office of Environment and Heritage <https://fieldcapture.ala.org.au/project/index/9b5dea6b-979b-45d5-8116-25be67f5e905>

15 Tulau MJ and McInnes-Clarke S (2015), Fire and Soils: A review of the potential impacts of different fire regimes on soil erosion and sedimentation, nutrient and carbon cycling, and water quantity and quality. © State of New South Wales and Office of Environment and Heritage 2016. <https://www.environment.nsw.gov.au/~media/6676FDEC72B546F5B849301424B29835.ashx>

16 Soares, M. R., & Alleoni, L. R. F. (2008). Contribution of Soil Organic Carbon to the Ion Exchange Capacity of Tropical Soils. *Journal of Sustainable Agriculture*, 32(3), 439–462. <https://doi.org/10.1080/10440040802257348>

17 Solly Emily F. , Weber Valentino , Zimmermann Stephan , Walthert Lorenz , Hagedorn Frank , Schmidt Michael W. I. (2020) Critical Evaluation of the Relationship Between the Effective Cation Exchange Capacity and Soil Organic Carbon Content in Swiss Forest Soils. *Frontiers in Forests and Global Change* Volume 3. <https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2020.00098>

science informing the CIFOA is a significant barrier to an understanding that reduced soil fertility including soil water holding capacity, leads to poor regeneration, the wilting and browning of leaves and tree mortality up-slope with BMAD and/or native ‘viney scrub’ down-slope.

The working plan also suggest the long-nosed potoroo exists within the Murrah Flora Reserves. While there is no publicly available evidence of this species in the reserves, it is generally accepted that the feral predators, foxes and cats play a large role in their decline and local extinction. The plan indicates -

“Continue management of the reserves in accordance with legislative requirements, NPWS guidelines and the regional pest management plan, with an emphasis on the recurrent wild dog control program.”

Any approach to mitigating the deleterious outcomes of past and current management must be cross-tenure and based on credible science.

3. Demand for timber products, particularly as relates to NSW housing, construction, mining, transport and retail

The demand for timber products from native forests will remain as long as there are trees available to be cut down. The term ‘renewable’ is frequently used to describe timber supply, although evidence to demonstrate the soil resource can sustain the growth to meet future demand is lacking. Supplies of large high quality sawlogs from native forests have declined as the resource has been mismanaged and over exploited. Most trees from native forests are logged for woodchips.

Meeting the demand for housing and construction will require greater investment in alternative crops like industrial hemp, that has uses including weight bearing ‘hempcrete’ blocks for housing¹⁸ Alternatives to timber in mining are available¹⁹ for purposes including jacking, cribbing and blocking tools for supporting heavy loads.

With regard to transport, the historic use of use of timber in railway sleepers, bridges and wharves is largely being replaced with concrete and steel.

4. The future of softwood and hardwood plantations and the continuation of Private Native Forestry in helping meet timber supply needs

A 1998 report²⁰ on plantation potential in the Eden region indicated a softwood plantations covered 34,440 hectares and hardwood plantations 1,070 hectares, with an additional 300 hectares of hardwood plantation trials. The report provided the following table on current and potential softwood plantations in the Eden RFA region.

TABLE 3B: SOFTWOOD RESOURCE VOLUMES FROM PLANTATIONS IN THE EDEN CRA REGION (SOURCE SFNSW)

	sawlogs (m3) per annum	pulpwood roundwood (tonnes) per annum	sawmill residues (tonnes) per annum
current harvest	50 000	35 000	0
potential 2002 a,b,c	290 000	200 000	87 000
potential 2010 a,b,c	380 000	270 000	114 000
potential 2020 a,b,c	550 000	270 000	165 000

18 Hempcrete facility on Mid North Coast paves way for alternative building materials(2024) ABC <https://www.abc.net.au/news/2024-03-13/industrial-hemp-processing-facility-on-the-mid-north-coast/103563976>

19 Australian Mining (2017) <https://www.australianmining.com.au/timber-is-no-support-tool/>

20 BUREAU OF RESOURCE SCIENCES, STATE FOREST NEW SOUTH WALES, AUSTRALIAN BUREAU OF AGRICULTURAL AND RESOURCE ECONOMICS Identification of Plantation Expansion Opportunities in New South Wales - Eden CRA Region A report undertaken for the NSW CRA/RFA Steering Committee April 1998 https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/rfa/regions/nsw-eden/resources/nsw__ed_na07es.pdf

- a) Potential 2002 level of yield based on current plantation resource; potential 2010 and potential 2020 levels of yield assume an expansion of the total plantation estate by 10,000 ha and 20,000 ha respectively.
- b) Sawlog availability predicated on the sale of all pulpwood and sawmill residue.

c) Potential yields represent sustained annual levels assuming an even distribution of age classes (which is not currently the case).

The report refers to factors affecting potential plantation growth and yield indicating the environmental influences are exerted through the interaction of the following factors:

- climatic factors (e.g. rainfall, air temperature, humidity, solar radiation and wind);
- soil factors (e.g. physical and chemical properties, water holding capacity and soil microorganisms) and
- topographic factors (e.g. slope, aspect and specific catchment area).

The Forestry Corporation's current GIS data²¹ does not accurately reflect the area of softwood plantations in State Forests of the Eden region, although it appears the area is slightly smaller in the Towamba area than it was in 1998. The area of hardwood plantations²² is about 12 hectares. Forestry Corporation's 'Forest types' layer²³ has a category labelled 'failed' which includes softwood plantation and may account for some of the previously reported hardwood plantations.

The continuation of Private Native Forestry in helping meet timber supply needs in Eden and the Southern region generally seems most unlikely to prop up the industry beyond short term, < 5 years.

5. The role of State Forests in maximising the delivery of a range of environmental, economic and social outcomes and options for diverse management, including Aboriginal forest management models.

The historic role of State Forests has been maximising timber production arguably to the detriment of longer term environmental, economic and social outcomes. I believe options for diverse management aimed at forest restoration and including Aboriginal forest management models are both greatly needed and long overdue. Unfortunately, there appears to be no scope for nature positive change, given the cultural constraints within NSW government agencies that preclude options based on credible science.

6. Opportunities to realise carbon and biodiversity benefits and support carbon and biodiversity markets, and mitigate and adapt to climate change risks, including the greenhouse gas emission impacts of different uses of forests and assessment of climate change risks to forests.

In order to make the most of these opportunities an approach to management that aims to increase biodiversity and soil fertility to enable improved carbon sequestration in soils and trees seems essential. Water is essential, but an improved understanding of forest hydrology is seemingly beyond NSW forest management agencies. This is despite the fact that methods capable of improving this understanding are readily available.

For example, all trees require water and it is possible to monitor tree water use²⁴, yet there is little evidence of such research being undertaken in NSW coastal forests.

There is an excellent opportunity to implement a cross-tenure approach to scientifically based forest management in the Murrah Flora Reserves and with the traditional owners, adjacent National Parks. For many such an approach is far more preferable than koala extinction and associated deforestation under current management.

It would also seem to make economic sense, given the multi-millions of dollars spent on achieving very little for koalas over the past 30 years.

Robert Bertram

October 2024

21 Forestry Corporation (2024) <https://data-fcnsw.opendata.arcgis.com/maps/e5c1c06cb4514a0ea15f7675b8ad4b3f>

22 Forestry Corporation (2024) <https://data-fcnsw.opendata.arcgis.com/maps/74b6f2dfed224759a3eb3729fd694016>

23 Forestry Corporation (2024) <https://data-fcnsw.opendata.arcgis.com/maps/4f2b972124ea4226917bc006a85b8e2f>

24 Sun, X.; Li, J.; Cameron, D.; Moore, G. (2022) On the Use of Sap Flow Measurements to Assess the Water Requirements of Three Australian Native Tree Species. *Agronomy* 12, 52. <https://doi.org/10.3390/>