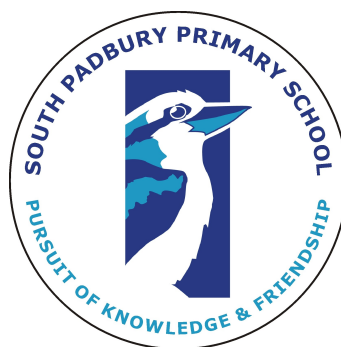


**Submission to the inquiry into the response of
Western Australian schools to climate change**



Inquiry into the response of Western Australian schools to climate change

Disclaimer: Please note that any views or opinions presented in this submission are solely those of the author and do not necessarily represent those of Murdoch University.

Background introduction regarding submitters

- Dr Grey Coupland (Research Fellow, Harry Butler Institute, Murdoch University)
- Professor Simon McKirdy (Pro-Vice Chancellor, Harry Butler Institute, Murdoch University)
- Carbon Positive, Australia
- South Padbury Primary School

Dr Grey Coupland is a Research Fellow at the Harry Butler Institute. Her skills lie in ecology, environmental restoration, climate change, ecosystem resilience, and community outreach and engagement. Dr Coupland is interested in the response of Western Australian schools to climate change due to her leadership of school outreach programs to engage children with environmental action. Dr Coupland has developed a scientific research program to bring Miyawaki (Tiny) forests into Western Australian primary schools, to engage children in climate action at a local level, and to increase biodiversity and cooling within the urban and school environments. This program resulted in the planting of the first Miyawaki forest at a school in Australia and the first forest of its kind in Western Australia (22 July 2021). As part of the dedicated STEM program, children planted the forest, and with ongoing guidance from Dr Coupland, are monitoring the growth, temperature regimes and biodiversity created by the forest over time. The program seeks to engage children in climate action at a local level and presents STEM as an interesting and viable future pathway.

Professor Simon McKirdy is a Pro-Vice Chancellor of the Harry Butler Institute at Murdoch University. Professor McKirdy has extensive experience from corporate leadership, research management, policy development and the management of biosecurity operations within the government and private sectors. He has international expertise in biosecurity. His career has included the roles of Quarantine Plant Pathologist for the State and Commonwealth governments; Program Manager at Plant Health Australia; CEO of the Australian Plant

Biosecurity Cooperative Research Centre; and Biosecurity Science and Risk Manager at Chevron Australia. Simon is Chairperson of the Western Australian Biosecurity Council. As Pro-Vice Chancellor of HBI, Professor McKirdy is interested in the response of Western Australian schools to climate change as it links with a key aspect of HBI's ethos involving education and engagement of young minds with environmental issues, following the philosophy of WA's internationally renowned conservationist Harry Butler.

Harry Butler Institute, Murdoch University

The Harry Butler Institute (HBI) is a research and education institute that seeks to link community, business and biodiversity. HBI is focused on sustainable development and enabling industry and government to deliver maximum economic value to the community, whilst simultaneously safeguarding the environment. Research centres at the Harry Butler Institute collaborate across academia, public sector, and industry on projects with impacts ranging from local to global. HBI is interested in the response of Western Australian schools to climate change as it a key aspect of the institute's ethos, involving education and engagement of young minds with environmental issues, following the philosophy of conservationist Harry Butler

Carbon Positive, Australia is an independent charity that brings together individuals, groups and organisations in order to restore unique, biodiverse natural habitat through planting trees and the generation of reforestation carbon offsets. Carbon Positive encourages, engages and informs the community about climate change, the environment and taking hands on action for a carbon positive future. Their actions empower people to take active steps to calculate and reduce their carbon footprint. They actively collaborate with other organisations to implement tree planting across Australia. Carbon Positive has a volunteer board, with their team based in Perth, Western Australia and Queensland. Carbon Positive is interested in the response of Western Australian schools to climate change as taking positive action to address climate change is at the core of the organisation's ethos. They are collaborating with Dr Coupland (HBI) to plant additional Miyawaki forests in urban heat sink areas of the Perth region.

South Padbury Primary School (Principal Cassarndra Disisto) is an independent primary school located in Perth's northern suburbs. The school is interested in the response of Western Australian schools to climate change as the school has a moral purpose centred around collaboration, inclusion and 'Being the Change' for their students, community and

each other. Staff at South Padbury Primary School are committed to ongoing improvement in both academic and non-academic student endeavours. The school has a strong emphasis on social development, etiquette and enrichment, both within the classroom and through additional programs. The school creates engaging opportunities for students through music ensembles, choir, student leadership, games and play-based learning, women's AFL, special interest clubs, bush conservation and bird watching, and environmental sustainability through the Urban Tiny (Miyawaki) Forest project. The school was the first school in Australia to plant a Miyawaki forest and boasts the first Miyawaki forest in Western Australia.

Key points – issues and solutions:

Issue

- Many newly built schools, and schools in disinvested areas, often have limited vegetation cover and are located in urban heat spots. These schools will suffer as temperatures increase over the coming years
- Many children feel a sense of disempowerment and anxiety regarding climate change as action is generally outside their nexus of control.
- There is currently limited school engagement with the topic of climate change, associated biodiversity loss and climate change solutions

Solution

- Miyawaki (tiny) forests planted at schools can actively cool schools where there is limited vegetation cover. Miyawaki forests can be fitted into any unused space between 10 m² and 400 m² in the school grounds. These are densely planted forests that contain a diverse array of locally native species.
- As part of the response of WA schools to climate change, schools should provide children with the capacity to engage with hands on environmental action regarding the climate crisis. This can in part be achieved by implementing the school outreach Miyawaki (tiny) forest program developed by Dr Grey Coupland from HBI. The program provides green space in small areas. It gives students a sense of empowerment and ownership, allowing children to see that through their own actions that they can make a difference to climate change at the local level.

- The Miyawaki (tiny) forest school program also teaches children about climate change in a non-confrontational manner. It provides tangible STEM curriculum engagement with real world outcomes.

Specific responses to Inquiry Terms of Reference

Below are specific comments in relation to the inquiry Terms of Reference.

a. Co-benefits of climate action in schools

Schools in Western Australia can take positive climate action that will provide a range of benefits. Through the participation in the Miyawaki (tiny) forest program, developed by Dr Grey Coupland from the Harry Butler Institute, schools can see benefits in the areas of student learning, and student and staff physical and mental health (see below).

Student learning

- the Miyawaki forest program engages children in STEM activities at an early age and will be particularly useful in encouraging girls to engage with STEM learning pathways.
- through the program, student learning covers theoretical understanding of Miyawaki forests; the Miyawaki method; climate change; biodiversity; urban sustainability issues; data collection methodologies
- the program assists students with their understanding of climate change.
- student learning through practical hands-on activity including planting of the forest; use of various items of scientific equipment; measurement of a range of variables (temperature, soil moisture and pH, plant mortality etc); plant and animal identification; data collection and management
- as part of the program students learn how to use the MyPestGuide app by the Department of Primary Industry and Regional Development to log the organisms they observe in the forest, and receive reports from DPIRD staff regarding identifications.
- the program enables students to have insight into their own carbon footprint using Carbon Positive's Carbon Footprint Calculator tool. This knowledge can then be compared with the carbon that the Miyawaki forests planted by students may sequester – giving the students a tangible way to understand the link between lifestyle carbon emissions and climate change mitigation. The calculator also provides

users with simple ways to reduce and offset the impact of their lifestyle to help combat climate change.

Student and staff physical health

- benefits to student and staff physical health through participation in active outdoor activity
- benefits to physical health through forest bathing/nature therapy (see benefits in Wen *et al.* 2019 – improved immune, cardiovascular, hemodynamic, neuroendocrine, and metabolic function)

Student and staff mental health –

- many students feel a degree of anxiety regarding climate change, and a sense of disempowerment as climate action is often outside their control.
- the Miyawaki program provides student and staff with positive mental outcomes by empowering and enabling students and staff to take positive climate action through hands-on action. The program can also involve interaction with the wider community as part of circular compost recycling required for forest soil preparation.
- the program will provide students and staff with the capacity for ‘forest bathing/nature therapy (see benefits in Kotera *et al.* 2020 – assists with emotional state, attitude, depression, stress, and mental relaxation)

b. Climate change mitigation and adaptation actions currently being undertaken in schools and the benefits they are achieving

The Miyawaki (tiny) forest program adopted by South Padbury Primary school (SPPS) is an excellent example of climate change action taken by a school. The school planted the first Miyawaki forest at a school in Australia and the first forest of its kind in Western Australia (22 July 2021). The forest was planted through a STEM education outreach program developed by Dr Grey Coupland from the Harry Butler Institute, Murdoch University. Dr Coupland created the collaborative program between HBI and the school to engage children in climate action at a local level, increase biodiversity and cooling within urban and school environments, and present STEM to students as an interesting and viable future pathway. The program is also a dedicated science research project in the Harry Butler Institute.

As part of the program, students planted the forest in SPPS grounds, and with ongoing guidance from Dr Coupland, are monitoring the growth, temperature regimes and biodiversity created by the forest over time. As the forest grows, it will provide shading and will lower the temperature of the surrounding school area (see studies by Ca *et al.* 1998; Aram *et al.* 2019). Children are taking air and soil temperature readings inside and outside the forest to document these temperature changes over time. The forest will also increase local species biodiversity.

The Miyawaki forest planted as SPPS has enabled the school to respond positively to climate change and has a range of benefits:

1. tangible climate change outcomes with future cooling of school grounds as the forest grows
2. empowering students and enabling them to take positive climate action
3. assisting students with their understanding of climate change.
4. student learning through theoretical understanding of Miyawaki forests; the Miyawaki method; climate change; urban sustainability issues; data collection methodologies
5. student learning through practical hands-on activity including planting of the forest; use of various items of scientific equipment; measurement of a range of variables (temperature, soil moisture and pH, plant mortality etc); plant and animal identification; data collection and management
6. student and staff physical health through participation in active outdoor activity and forest bathing/nature therapy (see benefits in Wen *et al.* 2019)
7. student and staff mental health by enabling them to take positive climate action that has tangible outcomes at the local levels, and through 'forest bathing/nature therapy (see benefits in Kotera *et al.* 2020)

c. Barriers that schools encounter in undertaking climate action and how these can be addressed.

Resources and cost

Many schools have limited capacity to direct funding towards mitigating and adapting to climate change. This impedes their capacity to take direct climate action, such a larger scale

tree planting activities to assist with cooling school grounds or installation of water capture equipment to reduce water consumption.

A solution would be to provide a pool of funding that Western Australian schools could access for the purpose of climate action. Alternately, a dedicated climate action program could be funded and implemented, such as the Miyawaki (tiny) forest program outlined above. The authors of this submission would be happy to assist with program development.

References

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