

Healthy Parks Healthy People South Australia 2021 – 2026

*Making contact with nature,
second nature*



Government
of South Australia



Our vision

All South Australians experience the health and wellbeing benefits of being connected to nature.

Acknowledgement of Country

Wellbeing SA, Green Adelaide, the Department for Environment and Water and the Department for Health and Wellbeing acknowledges and respects Aboriginal peoples as the state's First Nations people and recognises Aboriginal people as the traditional owners and occupiers of South Australian lands and waters.

WARNING: Aboriginal people are warned that this publication may contain culturally sensitive material, including images of persons who have died and we offer our apologies for any distress caused if this occurs.



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Joint Ministerial Statement

As the Ministers responsible for Health, Wellbeing and the Environment, we are pleased to present the refreshed **Healthy Parks Healthy People SA framework (HPHPSA) (2021-2026)**.

The updated HPHPSA framework builds on the successes of the original framework, acknowledging the collaborative efforts of the health and environment sectors to help more South Australians benefit from contact with nature. It also follows the renewal of the Public Health Partner Authority Agreement between the Department for Health and Wellbeing (DHW), Wellbeing SA and the Department for Environment and Water (DEW), which underpins this partnership approach.

Scientific evidence unequivocally shows that spending time in nature is good for us – it improves our physical and mental health and it has positive effects on our ability to concentrate, learn, solve problems, think critically, and be creative.

This is supported by what we feel when we get out into nature ourselves. We often turn to the natural environment when we need to “have a break” or “recharge our batteries” because we know intrinsically that it is good for us. We also know it is good for our kids – they can burn off some energy and learn new things as they explore.

However, we know that not everyone is able to access parks as easily as others. So, we are working together to ensure that more people can access more parks, more often. This means thinking about parks in their broadest sense – from large national parks, through to small, urban green spaces which are managed by local councils. We will work to address some of the known barriers to park use, including accessibility.

The framework enhances other State Government initiatives such as the new Glenthorne National Park, the opening of the reservoirs, protection of our coastline, our investment in national parks as well as broader SA Government commitments such as the recently launched Climate Change Strategy for South Australia.

The importance of open green spaces that reconnect communities with nature was highlighted by the measures the Commonwealth and State

Governments undertook in response to the COVID-19 pandemic in 2020. During this time, South Australian parks remained open for day visitors, providing opportunities for recreation as well as promoting community health and wellbeing. This was immensely popular with the State’s parks receiving increased visitation of up to 43 per cent over this time.

South Australia’s parks can play an important role in addressing social, environmental and health and wellbeing issues we face as a State. By providing opportunities for people to interact with nature through activities like play, exercise, relaxation and socialising with other people in the community, South Australians will be able to take advantage of the benefits of being outdoors. In addition, our parks are economic drivers for many communities across the State, and the backbone of our world-renowned nature-based tourism industry.

Healthy Parks Healthy People SA enables park and health authorities to work more closely together, and focus resources towards implementing innovative approaches to health and wellbeing. This framework is designed to act on the evidence and take advantage of the opportunities that exist in South Australia to help people connect with nature. This includes driving urban greening through the state’s new planning system, promoting our nature-based tourism industry, and building our climate resilience as part of the across-agency climate change strategy. This framework provides a platform to build new and strengthen existing relationships between stakeholders, who will work collaboratively with DHW, Wellbeing SA and DEW to continue to develop and implement Action Plans across the seven key focus areas.

We believe in this initiative and want all South Australians to experience the benefits of nature. We are firmly committed to protecting and promoting the health and sustainability of our parks and the health and wellbeing of our people.

Key focus areas:

1. Promoting physical activity in nature (Action Plan for release in 2021)
2. Mental health benefits of contact with nature (Action Plan released 2016)
3. Promoting the cultural value of Country for Aboriginal health and wellbeing (Joint Statement of Action launched 2019)
4. Community health and wellbeing in a changing climate
5. Nature education and childhood development
6. Green infrastructure in urban settings (Action Plan 1 released 2017, Action Plan 2 released 2020)
7. Biodiversity, conservation and human health.



Stephen Wade

Minister for Health and Wellbeing

A handwritten signature in black ink that reads "Stephen Wade".



David Speirs

Minister for Environment and Water

A handwritten signature in black ink that reads "David Speirs".



Statement from Executive Director Prevention & Population Health Directorate, Wellbeing SA

The factors that contribute to health and wellbeing are many, and often lie outside the health system and beyond the realms of the health portfolio. These factors, or determinants, of health and wellbeing include the social, economic and physical environment, as well as individual behaviours and characteristics.

The health of our environment and our ability to access the natural environment are critical to our health and wellbeing, particularly as we continue to face enormous challenges to society and the planet, like climate change.

Action on the determinants of health and wellbeing requires strong partnerships, collaboration and engagement to better respond to the needs of communities. Wellbeing SA are very proud to have a strong and ongoing, formal partnership with the Department for Environment and Water, which has been the key success factor in the co-delivery of Healthy Parks Healthy People SA.

2020 presented us all with an unprecedented level of uncertainty. South Australians faced bushfires that devastated many communities and parts of our natural environment. The world was then hit by the COVID-19 pandemic which has changed everything about the way we as humans consider our interaction with others and our environment introducing concepts such as physical distancing and self-isolation into our everyday vocabulary.

Now more than ever, we are compelled to consider the critical issues that underpin and directly link the health of humans and the health of the planet. In the South Australian context, this requires ongoing and committed leadership.

The governance of the public health system has undergone significant changes in the past few years, creating exciting opportunities to work with both new and existing partners to explore new ways of addressing such complex challenges and responding to population health and wellbeing issues.

With a view to rebalance the health system, Wellbeing SA has been established as an attached office of the Department for Health and Wellbeing. Wellbeing SA oversees community-wide health promotion, primary care and prevention services for all South Australians. Wellbeing SA is leading innovative system change to embed prevention across the life course.

This rebalancing will mean a significant change from a system that focuses on treating people when they become unwell, to one that is based on promoting physical, mental and social wellbeing, preventing ill health and supporting people to maintain wellbeing and lead healthier lives.

Professor Katina D'Onise

Co-Chair Healthy Parks Healthy People SA leadership team

Statement from Director of Green Adelaide

Green Adelaide was specifically created under this government's broader landscape reform in recognition of the environmental challenges faced in urban areas, including urban density and climate change. Green Adelaide will partner across government, NGOs, local government and the wider community to deliver on its seven integrated priorities, which includes coastal management; water resources and wetlands; biodiversity sensitive and water sensitive urban design; green streets and flourishing parklands; fauna, flora and ecosystem health in the urban environment; controlling pest plants and animals; and nature education.

Green Adelaide's goal is to transform our city into a wilder, sustainable, green and climate resilient city. These policy directions will underpin Adelaide's liveability, environmental sustainability and economic prosperity for future generations.

A liveable city is also a healthy city, promoting health, wellbeing and equity, particularly for those living in densely populated urban areas or in lower socio-economic areas. Our open spaces and green infrastructure play an essential role in giving people the chance to live healthier lives. Balancing nature and economic imperatives is a key challenge that is crucial for our population, while providing habitat for biodiversity and helping to adapt to climate change.

The scientific evidence that being in nature is critical for health and wellbeing is overwhelming. Healthy Parks Healthy People SA helps us to work more closely together to reinforce the critical role that nature plays. The definition of parks has been broadened to include our streetscapes so that being in nature starts at our front door. The way

we live in Adelaide and across South Australia is changing, particularly in Greater Adelaide. There is an increasing demand for new housing within the existing fabric of our cities, neighbourhoods and regional towns. Apartment living, small lot housing and increased urban density offer more housing choice, which reflects population trends and changing lifestyle demands.

With these changes to our cities, towns and suburbs comes the challenge of ensuring that access to quality public green spaces is maintained through our parks and reserves and playgrounds but also established in our suburbs, streets and backyards. Together we can support the retention of green space that is critical to human health. What we know is that partnerships across tiers of government and between public and private partners are critical in growing more green spaces in our cities. These partnerships will ensure that developing and maintaining open space also includes accessibility to nature, connection to community, supporting resilient neighbourhoods and promoting health and wellbeing.

I look forward to working together towards a more resilient landscape where people and nature are connected and where the importance of nature to our health and wellbeing is understood and acted upon.

Brenton Grear

Co-Chair Healthy Parks Healthy People SA leadership team



What is Healthy Parks Healthy People SA and why is it important?

Healthy Parks Healthy People SA is a nature-based approach to promoting and protecting population health and wellbeing. It is guided by a vision to ensure that all South Australians are connected to nature and recognise it as an integral component to their health and wellbeing.

Contact with nature enriches our physical, psychological, social and spiritual health and wellbeing. The links between the natural environment and health and wellbeing have been long understood. Aboriginal people have for many thousands of years understood and benefited from a strong relationship with land and Country. The approach of Aboriginal people to sustainably managing natural resources remains of utmost relevance. The cultural knowledge, skills, and perspectives of Aboriginal people must be recognised and embedded to shape decision-making and land management practice.

Parks of many forms – small local parks with playgrounds, large national parks, as well as marine parks – provide an accessible means for people, especially those living in urban areas, to have contact with nature. Importantly, all forms



of nature provide health and wellbeing benefits. Parks provide a range of services for human health such as water purification, air filtration, and climate regulation, pollination of agricultural crops, coastal protection and clean seafood. Conserving, protecting and promoting the benefits of parks and nature is a central goal of the Healthy Parks Healthy People SA approach.

For the urban population, as density increases, suburban streets and large green and brownfield developments are environments where green infrastructure is becoming an important asset for the protection and promotion of population health and wellbeing.

Deepening our relationship with the natural world has tremendous personal benefits. Direct nature experiences can strengthen our physical and mental health, the development of our children, our personal relationships with family, build safer and better connected neighbourhoods, strengthen our economy and nurture environmental stewardship to protect and conserve our natural environment.

Encouraging the use of parks for the health and wellbeing of South Australians relies on a shared philosophy and partnerships across many sectors. Healthy environments, including species biodiversity, are critical for human health. Parks conserve healthy environments for present and future generations, in both the urban and rural context.

Definitions:

Parks and nature

Parks and nature vary in size, purpose, user catchments and management strategies. The definition of parks and nature adopted by Healthy Parks Healthy People SA refers to nature in its broadest sense and encapsulates all natural environments, including: protected areas like national parks, regional parks and open space, local or neighbourhood and urban open space, streetscapes, private green space and marine parks.

Health and wellbeing

In the context of this framework and in accordance with the World Health Organization definition of health, health and wellbeing encapsulates a broad definition of physical, mental, social and spiritual health and wellbeing. It is not just about the absence of disease or illness. Health incorporates a focus on protecting health and preventing illness and disease, as well as seeking opportunities for health promotion to achieve improved population health outcomes.

How Healthy Parks Healthy People SA can deliver co-benefits

Many policy challenges involve dealing with complex, multifaceted, or so called ‘wicked problems’ that go beyond the capacity of individual organisations and authorities to understand and respond to in isolation and therefore require collaborative approaches. Such policy challenges include chronic disease, climate change, social exclusion and disadvantage, childhood development and land degradation.

Healthy Parks Healthy People SA is an approach built on a strong cross-sector partnership between and beyond the South Australian health and environment portfolios.

In 2015, in recognition of the significant opportunity for environment and health to work together to tackle complex issues, the former Department for Environment, Water and Natural Resources (now Department for Environment and Water) signed on as a Public Health Partner Authority, as legislated in the *Public Health Act 2011*. The South Australian *Public Health Act 2011* introduced the concept of Public Health Partner Authorities (PHPAs) to work together in an integrated way to achieve shared goals. Public Health Partner Authority agreements are voluntarily and are based on a co-benefits approach. Signatory agencies agree to collaborate on issues of mutual interest that contribute to improving health and wellbeing outcomes for South Australians.

This formal agreement led to the development of the first Healthy Parks Healthy People SA framework (2016 – 2021) launched in June 2016. The Agreement lapsed in 2018 and in 2019 a new agreement was signed. The intent of the renewed agreement has been to build on the successes of the program to date, to extend the partnership and continue the work of Healthy Parks Healthy People SA for a further five years. This renewal of the Healthy Parks Healthy People SA extends the original framework.

This second generation of Healthy Parks Healthy People SA recognises the significant changes that have occurred since the 2016 program launch, both within the South Australian policy landscape and in the evidence base and community energy surrounding this important connection between human health and wellbeing and our natural environment. This refresh showcases what Healthy Parks Healthy People SA has already achieved and outlines the priorities for the next five years.

There is an increased focus on the challenges presented for our urban population. It is predicted that 70 per cent of the world’s population will live in cities by 2050. In South Australia, Adelaide has been home to more than 70 per cent of the State’s population for decades and continues to increase. This results in many new challenges facing urban areas worldwide, including:

- increasing population density
- loss of natural habitat and pressure on wildlife populations
- increased demand for water resources
- declining social connection, health and wellbeing.

An opportunity to mitigate these issues exists through the provision of high quality urban green spaces, which have many benefits that support sustainable and liveable cities and healthy and connected communities, including:

- cooling cities and mitigating the 'heat island effect'
- slowing stormwater runoff
- filtering air pollution
- improving human immune systems
- providing habitat for plants and animals
- making people happier and calmer
- creating areas for sport and physical activity
- encouraging active transport such as walking and cycling
- promoting social interaction.

Healthy Parks Healthy People SA provides opportunities to mitigate and adapt to climate change. Adelaide's future growth and prosperity depend on sustaining, protecting and growing our natural environments, taking on the challenges of a drying and warming climate and safeguarding and promoting the health and wellbeing of the community.

As the second generation of this program evolves, our continued objectives are to:

- 1.** Help those South Australians who don't visit parks and access nature to overcome whatever is holding them back from doing so.
- 2.** Encourage South Australians who already use parks and access nature to become more regular visitors to gain further health and wellbeing benefits.





What has Healthy Parks Healthy People SA 2016-2021 delivered?

The Healthy Parks Healthy People SA program raised awareness of the importance of our natural environment, parks and open spaces, ensuring South Australians have improved access and health and wellbeing benefits of direct contact with nature.

Specific outputs have been delivered that largely reflect the 2016-2021 priority focus areas: 2) Mental health benefits of contact with nature, 3) Promoting the cultural value of Country for Aboriginal health and wellbeing and 6) Green infrastructure in urban settings. Table 1 (pg 13) outlines these outputs and the areas of key activity to date.

The achievements and sustainability of the Healthy Parks Healthy People SA program has been underpinned by a number of critical success factors. Strong governance and leadership has enabled the program to deliver on its key objectives and make the most of strategic opportunities. In addition, the strength of cross-sectoral working relationships, and network of invested partners and key stakeholders has supported timely and effective activity under the priority focus areas.



Critical Success Factor 1: Governance and leadership

The Public Healthy Partner Authority Agreement committed the two agencies to establish a high level strategic advisory group comprised of senior agency representatives and other key stakeholders. This strategic advisory group has been known as the Healthy Parks Healthy People SA Leadership Team (the Leadership Team). The primary purpose of the Leadership Team has been to provide expert advice and strategic oversight for the implementation of the Healthy Parks Healthy People SA approach. The Leadership Team identified agreed priority areas for collaborative action and provided accountability and oversight of the annual reporting against the program.

Importantly, the Leadership Team met at regular intervals and provided guidance to ensure the program has continued to achieve the following high level deliverables:

- Policy integration: greater policy alignment and action on areas where co-benefits are identified.
- Partnership opportunities between sectors: increased opportunities for partnership and collaboration between the two agencies (as well as partnership opportunities with other agencies/ sectors and the wider South Australian community).

- Knowledge brokering: sharing of information and research between agencies and with external stakeholders, including volunteer networks and research providers.
- Increased capacity: delivery of joint objectives across both sectors, through utilisation of the co-design, co-production and co-benefits principles; and through the use of shared knowledge and resources.
- Advocacy: where appropriate and agreed, advocate in accordance with the direction of the Healthy Parks Healthy People SA strategic position.

Much of the success of Healthy Parks Healthy People SA can be attributed to this high level oversight and ongoing commitment from senior leaders within both agencies, which has ensured sustainability and accountability in the Healthy Parks Healthy People SA approach.

Critical Success Factor 2: Partnerships and networks

Strong partnerships and networks, both across sectors and with a broad coalition of stakeholders, has been a critical success factor of Healthy Parks Healthy People SA. The agenda of each of the active focus areas has been driven by collaborative working groups, with a Project Working Group to drive and operationalise the agenda and a Stakeholder Reference Group to inform decisions, identify key players and share knowledge, lessons learned and outcomes. These networks are fostered through and underpinned by co-design, co-production and co-benefits principles and through the use of shared knowledge and resources.

The Quality Green Open Space Reference Group, established to drive the implementation of actions for Focus Area 6 Infrastructure in Urban Settings, is an excellent example of this. Established in 2016, the group contribute a broader perspective to the implementation of the Action Plan, and includes representation from state and local government, the development sector and other non-government organisations responsible for the design, development and long term management of green open space. The diverse group meet regularly to exchange ideas and progress action collaboratively. This has been a strong driver of the actions and outcomes under this focus area, particularly through enabling identification of policy opportunities to increase green infrastructure in urban settings. For example, a guide was released in 2019, *Creating Greener Places for Healthy and Sustainable Communities*, to promote and prioritise quality green open space in urban neighbourhoods.



Table 1 – Achievements and outputs of Healthy Parks Healthy People SA 2016-2021

Focus area	Working group	Action plan	Stakeholder reference group	State of play
1. Promoting physical activity in nature	Wellbeing SA (WBSA), Department for Environment and Water (DEW), Local Government Association (LGA SA), Office for Recreation, Sport and Racing (ORSR), Heart Foundation SA, Parks and Leisure Australia	In early development	TBD	Action Plan to be launched in 2021
2. Mental health benefits of contact with nature	WBSA, DEW, Office of the Chief Psychiatrist, SA Health SA Suicide Prevention Networks, Mental Health Coalition of SA	Realising the Mental Health Benefits Of Contact With Nature Action Plan 2016-2021	Mental Health and Nature Reference Group: mental health practitioners, advocates for mental health prevention and promotion, environmental or health policy officers and academics.	Action Plan complete. '5 Ways to Wellbeing in Nature' Masterclass postponed to 2021
3. Promoting the Cultural value of Country for Aboriginal health and well-being	WBSA, DEW, SA Health and Medical Research Institute, Aboriginal Affairs and Reconciliation, Department of the Premier and Cabinet	Joint Statement of Action: Connection to Country for Aboriginal Health and Wellbeing	A self-nominated Statement Reference Group was established to oversee the development of the Joint Statement of Action	Ongoing – Working Group continue to identify opportunities to support activities that demonstrate the principles of the Joint Statement of Action
4. Community health and well-being in a changing climate		To be explored as part of refreshed agenda		
5. Childhood development and nature		To be explored as part of refreshed agenda		
6. Green infrastructure in urban settings	WBSA, DEW, Planning and land use, Attorney-General's Department (AGD) Australian Institute of Landscape Architects (SA), Office for Design and Architecture AGD	Quality Green Open Space Action Plan 2020-22	Department for Infrastructure and Transport, ORSR, Active Living Coalition, Heart Foundation (SA), Water Sensitive SA, Parks and Leisure Australia, SA Water, Stormwater SA, LGA SA, Urban local councils	Implementation of Action Plan – progressing
7. Biodiversity Conservation and human health		To be explored as part of refreshed agenda		

What will Healthy Parks Healthy People SA deliver in 2021-2026?

Healthy Parks Healthy People SA is committed to ensuring that all South Australians experience the health and wellbeing benefits of being connected to nature.

We want to ensure that nature becomes a vital part of the solution to broader health and social issues challenging our state. We want to demonstrate that by increasing our connection with nature, through our unique and wonderful parks and natural environment, South Australians will experience population health solutions that will:

- build safe, healthy and connected neighbourhoods
- provide the best outdoor opportunities for developing happy and healthy children
- contribute to the state's economic productivity agenda
- preserve and promote Aboriginal culture
- support the recovery of the one in five Australians who experience mental health problems
- address some of the preventable causes of obesity and other chronic diseases
- promote better mental health and wellbeing across the whole population
- reduce costs to the health system through prevention and early intervention
- create a liveable urban environment
- underpin the climate change agenda.

To achieve this, in the longer term Healthy Parks Healthy People SA aims to continue to improve understandings of:

- what is influencing South Australians' personal relationship to nature
- park visitor needs and expectations
- the needs of economically, socially and mobility disadvantaged groups
- the cost and consequences of inaction, in terms of the impact on the health and wellbeing of individual South Australians, their families and communities, and the economy as a whole.

Renewal of the Key Focus Areas for Action: highlighting the growing evidence base

Activating the evidence – connecting nature to health – continues to be a cornerstone of Healthy Parks Healthy People SA. Based on a comprehensive review of the literature, the first framework determined seven focus areas for action; these focus areas will remain the same for this second generation of the program. The following sections describe the evidence base – which has grown since the launch of the first framework - to highlight why these areas of focus are most important to the Healthy Parks Healthy People SA agenda. These Key Focus Areas include:

- 1.** Promoting physical activity in nature (Action plan in development)
- 2.** Mental health benefits of contact with nature - (*Action Plan* launched in 2016)
- 3.** Promoting the cultural value of Country for Aboriginal health and wellbeing - (*Joint Statement of Action* launched in 2019)
- 4.** Community health and wellbeing in a changing climate
- 5.** Nature education and childhood development
- 6.** Green infrastructure in urban settings – (*Action Plan 1* launched in 2017, *Action Plan 2* launched in 2020)
- 7.** Biodiversity, conservation and human health.

Healthy Parks Healthy People SA will continue to build on new ideas and partnerships that will underpin our vision and promote action across these focus areas. We aim to find compelling ways to communicate and work with new and existing partners to deliver nature-based approaches for population health.

The Healthy Parks Healthy People SA Program Logic is outlined on page 52.

Policy setting and opportunities

One of the processes through which Healthy Parks Healthy People SA is able to sustain or build momentum towards new ideas and partnerships that will underpin our vision and promote action across these focus areas, is by maximising on opportunities presented through the broader policy landscape of the South Australian government. There are several currently State-wide strategies or legislative frameworks which either currently, or may in future, present strategic opportunities for collaboration and action through the Healthy Parks Healthy People Agenda, particularly in relation to the health and wellbeing and environment sectors. These include:

- SA State-wide Wellbeing strategy is led by Wellbeing SA and includes priority focus areas related to mental, physical, social and community wellbeing.
- State Public Health Plan 2020-2024
- SA Public Health Act
- Wellbeing SA Strategic Plan 2020-2025
- Nature Conservation strategy – led by DEW
- *Landscape South Australia Act 2019* - Each region is responsible for developing and implementing a Landscape Plan that identifies regional priorities and opportunities.
- The Parks 2025 Strategy
- Green Adelaide Strategic Plan 2021-2026
- The Access For All Program (DEW) – focused on removing barriers and increasing community inclusion in parks by providing strategic and technical advice for the delivery of accessibility and community inclusion programs and infrastructure in parks.
- Supporting North/South Corridor Department of Infrastructure and Transport project - opportunity to work with AILA, DIT, DEW and Green Adelaide to support climate change mitigation and adaptation opportunities for the north/south corridor.
- Scoping the opportunity to establish Adelaide as a National Park City - A National Park City recognises the value of urban life, habitats, landscapes, and people and culture. It seeks to apply appropriate national park principles to whole cities to improve many aspects of urban living.
- The South Australian Government Climate Change Action Plan 2021-2025
- Directions for a Climate Smart South Australia (2019)
- Game On: Getting South Australia Moving framework (2020)
- Blue Carbon Strategy for South Australia (2019)
- The 30-Year Plan for Greater Adelaide (2017 Update)
- Opening of reservoirs.

“Humans can live in places denuded, even devoid of nature. But these dull, lifeless communities make us miserable, poor and ill, both mentally and physically. So why should we live like that? The simplest, cheapest and most effective way to create healthy, happy, connected communities is to provide vibrant and active parks filled with wildlife, intertwined with our living and work spaces. Why would we want it any other way?”

Chris Daniels

Chair Green Adelaide,
Chief Executive, Koala Life



Access for all

Nearly one in five South Australians report having a disability. Of South Australians with disability, one in six uses a mobility aid like a wheelchair or a walking stick and one in three uses a communication aid, like cochlear implants or speaking aids. One in five South Australians with disability need assistance with cognitive or emotional tasks.

The incidence of disability increases with age and currently 43 per cent of Australians over 55 years have one or more disabilities. People with a disability are also more likely to experience early onset of many chronic conditions (ABS 2018). People experiencing disabilities find it more difficult to access our natural environment, due to many barriers, yet they often have poorer health outcomes, which may benefit from time spent in nature. With an estimated 20 per cent of Australian

adults having a disability or long-term health condition and an ageing population, the disability sector is set to grow, therefore presenting a timely opportunity to explore greater access opportunities to nature for those with disability.

DEW has had a continual improvement program to support physical accessibility, including through more accessible paths, toilets, carparks, parks and botanic gardens. A number of trails managed are now classified as Class 2 (assisted access), autism awareness training for rangers has been conducted, as have programs inclusive of children and adults with physical, mental health and intellectual disability.

Focus Area 1: Promoting physical activity in nature

How does being physically active in nature improve health and wellbeing?

The health and wellbeing benefits associated with physical activity participation across the lifespan are well known. Engaging regularly in physical activity promotes improved aerobic fitness, bone health, sleep, immune responses and mental and cognitive health and wellbeing (Chen et al. 2020; Tamminen et al. 2020; Powell et al. 2019; Singh et al. 2019; World Health Organization 2018; Campbell and Turner 2018). Physical activity participation also reduces the risk of early death (Saint-Maurice 2020; Zhao 2020); developing cardiovascular disease, type 2 diabetes, some forms of cancer (Powell et al. 2019; World Health Organization 2018; Warburton and Bredin 2017); and other disease risk factors such as overweight and obesity, high blood pressure and high blood cholesterol (Powell et al. 2019; World Health Organization 2018). Despite these widely known benefits, approximately one third of South Australian adults and four out of five children and young people do not meet the recommended physical activity guidelines (Wellbeing SA 2019).

Increased physical activity participation, especially for those who do none or very little physical activity, accrues vast health and wellbeing benefits, no matter what the setting. There is also a strong evidence base that shows spending time in natural green and blue spaces like local parks and reserves or the coastline and local creek beds, can have positive impacts on a person's health and wellbeing irrespective of what they do when they are there (Lachowycz, Jones and u.Planning 2013; Houlden et al. 2018; McCormick 2017; White et al. 2019; Twohig-Bennet and Jones 2018; Davern et al. 2017). When we then consider nature as a destination or setting for physical activity participation the evidence suggests that:

- People are more likely to be physically active, at a moderate intensity or higher, rather than sedentary when visiting local parks (Joseph and Maddock 2017)
- Children and adults with greater exposure and access to green spaces are likely to engage in much more moderate-to-vigorous physical activity (children and adults) and walking (adults only) than those with no exposure or limited access to green space (Almanza et al. 2012; Astell-Burt, Feng and Kolt 2014)
- People who engage in group walks in nature, regardless of frequency, can experience a reduction in perceived stress, depression and negative emotions and improvements in mental wellbeing and positive emotions (Marselle et al. 2019)
- Physical activity participation in nature may lead to lower perceived exertion (i.e., it feels easier) and increased motivation to participate more regularly (Gladwell et al. 2013)
- Short bouts (as short as five minutes) of physical activity in both natural green and blue spaces can result in immediate improvements in mood and self-esteem (Barton 2010).
- The different types and quality-related characteristics of natural green and blue spaces can have various effects on an individual's health and wellbeing, including physical activity participation, social contact, psychological factors, exposure to air pollution and immunological function (Wheeler et al. 2015).

“People and nature are connected and we should all be encouraged to keep that connection strong. Active participation in our parks and gardens allows us to all be healthy”

Parry Agius
Presiding Member
Alinytjara Wilurara Landscape Board

Policy and research opportunities

Undeniably physical activity and nature whether together or on their own are important factors that need to be prioritised for population health and wellbeing. It is important that we support access to natural green and blue spaces, for all people to use as destinations for physical activity participation across the lifespan. These spaces must have multiple uses and require little or no cost so that all South Australians can reap the benefits of being physically active in nature.

Supporting destinations for physical activity in nature is a growing area of focus in many jurisdictions around the world as well as locally here in South Australia; *Creating Active Environments: Spaces and Places* is a key focus area of the *World Health Organizations Global Action Plan on Physical Activity (2018)*.

In South Australia, during 2020 a number of key strategies and frameworks across government and key state-wide agencies were released that speak to the importance of physical activity as a protective factor for health and wellbeing, which may support emerging opportunities for collaborative action. Nature as a destination for physical activity participation is highlighted in some instances within; Wellbeing SA Strategic Plan, The Office for Recreation, Sport and Racing Game On: Getting South Australia moving framework; The 'Open Your World' State-wide Wellbeing Strategy; the Women's & Children's Health Network Strategy 2026: Realising Potential, Creating Together. Dependent on the evidence-base and partner priorities physical activity may feature as an action area in this strategy; the Infrastructure SA 20-Year Strategy — two of the priorities (Priority 22 & 24) may provide scope to support the development and maintenance of high quality green and blue corridors for South Australians to use for active transport.





Case-study: Adelaide 100 project

Funded by Wellbeing SA and the SA Office for Recreation, Sport and Racing, Walking SA's Adelaide 100 project is a 100km circuit walk that traverses the city and the suburbs of Adelaide. The key objective of the Adelaide 100 project, launched in October 2020, is to create a unique walking trail which will increase the level of walking activity across the whole South Australian community.

Walking is linked to positive health outcomes, including a reduction in all-cause mortality, cardiovascular disease, obesity, diabetes and an improvement to mental health. The Adelaide 100 has been designed to be started from any point along the circuit, and extends from the coastline, through the CBD and suburbs, and into the Adelaide Hills (it covers 12 Local Government Areas and 8 national parks). The Adelaide 100 will join up existing walking trails and aims to enable more people to walk more often through features including:

- **Affordability:** use of the trail is free
- **Accessibility:** the trail can be easily accessed from the CBD, public transport, and major Adelaide points of interest, with many sections of the trail offering wheelchair access
- **Diversity of terrain:** coastlines, the River Torrens, Linear Park, Adelaide Hills, following a variety of unique bush trails with views over the city and coast wide-ranging appeal: walkers of differing levels of fitness and mobility can access the varied sections of the trail from various points, from the flat of the coastal trail, the gentle slope of the linear park along the river, and the slightly steeper bush trails through the Adelaide Hills
- **Connectivity:** utilisation of and connecting existing walking trails, eliminating additional major infrastructure costs associated with creating such a circuit from scratch
- **Flexibility:** the 100km trail can be completed over a five or six day continuous period, or completed in smaller sections at a time
- **An economic and tourism boost:** local businesses including accommodation, cafes restaurants and other services will benefit from the tourism uplift along the trail; many unique tourist points are traversed along the trail including the summit of Mount Lofty, Cleland Conservation Park, Adelaide Zoo, Adelaide's beaches, Adelaide Hills wineries, unique indigenous sites and historic points.



Focus Area 2: Mental health benefits of contact with nature

Growing evidence demonstrates that the connection between humans and the natural environment is integral to the protection of population mental health and wellbeing. Connection to nature and parks is not only important in the treatment of mental health conditions, but provides many opportunities for strengthening mental health and wellbeing in our communities.

Many scholars have argued the significance of this inherent psychological, emotional, and spiritual connection between humans and nature (Wilson 1984; Katcher and Beck 1987; Maller et al. 2009; Williams 2016). In 'Biophilia,' Wilson (1984) hypothesizes that humans instinctively need to bond with nature. Kaplan (1995) suggests that being close to nature helps people to forget their worries, clear their mind, relax and reflect in solitude.

Urban living has been identified as a key factor contributing to increased stress and mental ill-health (Northridge & Freeman 2011; Abbott 2012). Research investigating the connection between

mental health and green spaces recognises that living in close proximity to useable parks and green spaces mediates individual resilience and life coping skills (van den Berg 2010). Providing parks in local neighbourhoods and within walking distance has also been shown to be important for protecting positive mental health, including parks of varying scales and size (Wood et al. 2017). A dose-response relationship has been shown where if a minimum of 20 per cent vegetation cover is met in a local neighbourhood, significantly lower depression, anxiety and stress levels can be achieved (Cox 2017; Beyer 2014). Exposure to neighbourhood green space can both reduce stress and enhance relaxation, restoration (Roe 2013; van den Berg 2010; Schebella 2019) and recovery from acute stress and mental fatigue (van den Berg, et al. 2010; Schebella 2019; Ulrich 1991). Urban green space can also decrease levels of perceived stress and cortisol levels (Longden 2018; Rojas-Rueda, 2019; Ulrich 1991; van den Berg et al. 2016; van den Berg et al. 2007; Grahn and Stigsdotter 2010; Lee et al. 2009).



In an age where more and more of us are living in an urban context and access to expansive, awe-inspiring natural environments may be more difficult to achieve regularly, it's important that urban settings provide opportunities for smaller scale nature experiences. A several day hike or trip to the river, are wonderful ways to feel immersed in nature. Equally, being able to spot a bird in a local tree and sit at a local park can also offer important nature doses, that may evoke a sense of calm for urban dwellers.

New strategies that are both treatment and prevention focused are much needed to address the rising incidence of mental health issues our communities face. Mental illnesses are a leading cause of the South Australian disease burden, behind cardiovascular disease and cancer (Australian Institute of Health and Welfare 2019). In 2017-18, 4.8 million Australians (20.1 per cent) were reported to have a mental or behavioural condition; an increase of 2.6 percentage points from 2014–15. This increase was mainly attributed to an increase in the number of people reporting anxiety-related conditions, depression, or feelings of depression. In December 2016, the National Mental Health Commission stated that the cost of mental ill-health in Australia each year was around \$4,000 per person (\$60 billion in total).

Suicide rates are also rising. In 2019, preliminary data showed an average of 9.1 deaths by suicide in Australia each day (*Mindframe*, 2019).

The national recurrent expenditure on mental health-related services was estimated to be around \$9.9 billion in 2017–18. Productivity Commission (2019) research indicates that mental health concerns cost Australia up to \$180 billion a year – equating to \$500 million every day – in lost productivity and participation. Nature offers many benefits for enhancing mental health and wellbeing (Sugiyama et al. 2008) and provides many opportunities for addressing these issues.

For children; greater mental wellbeing, reduced hyperactivity and inattention problems (Blanck et al. 2012), and reduced risk of developing a mental disorder (Engemann 2019) are all associated with exposure to local green spaces. Evidence of more distal benefits for child development and mental wellbeing linked to nature, show linkages such as: improved mental wellbeing, cognitive development, attention restoration, memory, competence, supportive social groups, self-discipline, moderation of stress, improvement in behaviours and (Attention Deficit Hyperactivity Disorder) symptoms (McCormick 2017). For adolescents and young adults, local green space has been associated with less depressive symptoms (Vanaken and Danckaerts 2018) and lower levels of cortisol and perceived stress (Longden 2018; Rojas-Rueda 2019; Ulrich 1991; Engemann 2019; McCormick 2017). Adolescents who report spending time in green outdoor spaces report a greater sense of calm, focus during study, wellness and appreciation for the environment, as well as empathy towards environmental issues (Burriss and Burriss 2011; Quynh et al. 2013).

The restorative effects of exposure to parks and green open spaces include recovery among individuals experiencing clinical conditions associated with anxiety and depression; reduced chronic stress (Alvarsson et al. 2010; Vella et al. 2013). Moreover, for older people, the mental health benefits of access to parks are even more pronounced compared to either adolescents or adult sub groups (Hawkins et al. 2013).

There are also growing correlations between levels of varied species biodiversity and mental health and wellbeing, such as emotional responses to avian biodiversity (Cameron et al. 2020), improvement in children's mood as a response to biodiversity focused learning (Harvey et al. 2020) and correlations between perceived attractiveness of natural planting features and structures like colourful flower features, and restorative effect (Hoyle et al. 2017).

When it comes to the workplace, nature can reduce stress levels (Largo-Wight et al. 2011) and enhance attention and concentration at work (Hochuli and Taylor 2017). According to the Nature Conservancy (2017), nature can improve the creativity and sharpness of employee thinking, and features in the work environment - such as access to a small garden or the opportunity to sit next to a street tree - can provide a fulfilling nature experience (Hochuli and Taylor 2017). Moreover, green open space options for unwinding are more favourable than interventions involving indoor rest or meditation, particularly for adults who spend a large proportion of their week indoors (Grinde & Patil 2009).

The role of nature as an upstream promotion and prevention strategy in public health has started to gain interest from a research, policy and clinical perspective. Exposure to parks and nature promotes mental wellbeing, including evoking positive emotions and an increased feeling of individual resilience (Marselle et al. 2013). Connection to nature is therefore critical for disease prevention, and to promote positive psychological states (Beil & Hanes 2013; Abraham et al. 2010; O'Brien et al. 2014). Nature and green space offer an affordable, accessible and equitable resource in both health promotion and restorative public health interventions (Maller et al. 2006; Mind 2007).

Policy and research opportunities

In South Australia, mental health policy is led by the SA Health Office for the Chief Psychiatrist and the newly established Wellbeing SA Directorate for Mental Health and Wellbeing (formerly the Mental Health Commission). Mental health and wellbeing is one of the three key priority areas of the Wellbeing SA Strategic Plan.

The mental health and wellbeing of our population has been one of the most significant concerns from the response to the COVID-19 pandemic in 2020. The physical distancing and isolation requirements, along with the health and economic uncertainty associated with the response put enormous and unprecedented pressure on the mental health and wellbeing of the population. The State Wellbeing Strategy in response to COVID-19 includes encouraging use of green space in recognition of the health, wellbeing and environmental benefits as priority area 3.

Future opportunities to further understand and promote the mental health benefits of contact with nature may include:

- Exploring a research agenda for the impacts of COVID-19 on nature access and relationship to mental health and wellbeing.
- Partnering further with the Department for Health and Wellbeing Office for the Chief Psychiatrist in relation to Suicide Prevention in South Australia and the role that nature can play in supporting the South Australian Suicide Prevention networks.
- Exploring a research agenda to better understand the social context of mental distress and poor mental health. Those experiencing stress and mental ill-health are more likely to be negatively impacted by the social determinants of health i.e. where they live, how they can access services including parks and green space, financial security.
- Exploring the economic cost of mental ill health and the cost savings that may be achieved through further investment in preventative strategies, like the benefits of nature experiences of varying scales and doses, and forecasting of potential mental health system cost savings.



Case study: Five Ways to Wellbeing in Nature

Whilst most people know the simple things they can do to protect their physical health, people are less likely to know what they could do regularly to protect their mental health. What we know is that as life becomes busier, people are becoming more and more stressed in their daily lives.

The 5 Ways to Wellbeing in Nature Campaign was launched through Healthy Parks Healthy People SA in December 2017. Based on the New Economic Foundations original 5 Ways to Wellbeing (2008), the 5 Ways to Wellbeing in Nature uses simple language and uplifting and inspiring visuals to demonstrate ways that every South Australian can look after their mental health and wellbeing, and the positive mental health benefits of spending more time in or with nature.

The five ways are evidence based and universally applicable activities: > connect > be active > take notice > keep learning and > give. They can be practiced individually, in groups, within settings like community groups or as part of a workplace wellbeing program. There are many ways to incorporate nature and the boost it offers in promoting positive mental health and wellbeing.

The SA campaign was developed in partnership with a broad range of stakeholders and partners in the mental

health and environment sectors and with the SA Mental Health Commission and South Australia's Suicide Prevention Networks.

The campaign generated a huge amount of interest. It was the most viewed site on the SA Health webpage in the month of its launch. The materials developed have continued to be utilised by groups in many different ways.

In 2020, a *5 Ways to Wellbeing in Nature and Beyond Masterclass* was planned, however cancelled at the last minute, due to the outbreak of COVID-19. The vision for the Masterclass was to identify and bring together community leaders to discuss opportunities for applying and using the 5 Ways messaging in the context of their networks. This approach intends to support opportunities for further awareness raising of the strategies and practices for improved promotion and protection of mental health and wellbeing, at the individual and community level. Options for reactivating this masterclass will be explored in 2021-22, including potentially transitioning the Masterclass to an online format, and exploring interest in the establishment of a 5 Ways to Wellbeing community of practice network in South Australia.



Focus Area 3: Connection to Country for Aboriginal Health and Wellbeing

Aboriginal perceptions of health and wellbeing are holistic and determined by a range of life factors, including physical health and wellbeing, cultural connection, environmental, social inclusion, identity and autonomy (Salmon et al. 2018). Unfortunately, many of these factors have been negatively impacted by the processes and policies of colonisation, which has in turn contributed to the higher burden of disease and significant gap in life expectancy experienced by Aboriginal people. The social determinants of health – the living and working conditions that define the social environment - play a significant role in the gap in Aboriginal health; the higher burden of disease among Aboriginal Australians can be linked to the poorer socioeconomic conditions Aboriginal people experience on average.

Aboriginal communities and people view their health as holistic. According to Gee et al. (2014), Aboriginal health is underpinned by social and

emotional wellbeing; “a multidimensional concept of health that includes mental health, but which also encompasses domains of health and wellbeing such as connection to land or ‘country,’ culture, spirituality, ancestry, family, and community”. When social and emotional wellbeing is compromised, the resultant risk behaviours and outcomes can include: stress/distress, anxiety, depression, problem gambling, high risk alcohol consumption, recreational drug use, violence, and/or suicide (Gee et al. 2014).

Connection and/or re-connection to Country are thus significant determinants of health and wellbeing for Aboriginal people; they form part of Aboriginal peoples’ sense of belonging, identity and self-determination.

For Aboriginal people, Country, culture and language are intrinsically linked. Country is more than a physical place; it is a place of belonging

and a way of believing. Country encompasses values, family, places, resources, stories and cultural obligations associated with Aboriginal people's rights and identity. The reciprocal and interdependent relationship between ancestral lands and seas is sustained by cultural knowledge and opportunities for connection. This relationship, and the cultural practices and customs that strengthen and protect it, vary between places and communities. Preserving these practices, and sharing knowledge of these traditions, is therefore vital for Aboriginal communities and future generations.

Western evidence to support this long-standing cultural understanding of the importance of Connection to Country continues to grow. Qualitative research has consistently found that Aboriginal and Torres Strait Islander Australians afford a central role to culture and cultural identity in their conception of wellbeing, and to connection to traditional Country as a source of that identity (Butler et al. 2019; Kingsley, Kingsley et al. 2013; Yap and Yu 2016; Le Grande et al. 2017). Stronger relationships with Country and greater involvement in cultural practices enhance the wellbeing of Aboriginal Australians, and this is a protective factor for health and wellbeing. Those in more remote regions have greater access to their Country and thus higher levels of wellbeing (Schultz et al. 2018). There is also evidence to suggest that a stronger connection to Country has a positive effect on general health for Indigenous children living in inner regional Australia (Dockery 2020).

There is also evidence of benefits that arise from specific Connection to Country initiatives. Studies have shown a range of physical and mental health outcomes associated with participation in 'caring for Country' or Ranger programs (Campbell et al. 2011; Jones et al. 2018). Land management services offer Aboriginal and Torres Strait Islander people aspects of primary health care through community, economic and social development, self-reliance and self-determination, and provision of basic needs extending beyond clinical health services (World Health Organization 1978). Indigenous land management programs typically work across different sectors promoting collaboration between services, and have been identified as a source of comprehensive primary health care (Schultz et al. 2018). Direct health impacts for Aboriginal and Torres Strait Islander

people's involvement in land management include increased physical activity; less alcohol and illicit substance use; greater access to bush foods; and less access to takeaway foods (Burgess et al. 2008; Davies et al. 2011; Hill et al. 2013).

Burgess et al. (2005) undertook research in Arnhem Land to identify health links between Country and people. The research was undertaken by a multidisciplinary team of traditional owners, ecologists, social scientists, medical practitioners and policy analysts, and looked at the broader implications of this research (Garnett & Sithole 2007). The study found positive associations between caring for Country activities (which Indigenous people perceived as beneficial to their health) and health outcomes, such as: more frequent exercise, lower rates of obesity, lower rates of diabetes, lower rates of renal disease, lower rates of cardiovascular disease, and less psychological stress (Garnett and Sithole 2007; Burgess, Mileran and Bailie 2008).

More recently, findings of the Interplay Research Project highlighted Indigenous Land Management as a source of wellbeing, through strengthened identity and empowerment, access to traditional food sources, enjoyable physical activity, and escape from communities where high levels of alcohol are consumed (Schultz et al. 2018). Participants of the Interplay Research study described how collaboration and partnerships between services, and recognition of Indigenous languages could enhance wellbeing; while on the other hand, the study identified that competition between services can undermine wellbeing.

Connection to Country is without a doubt a central element of Aboriginal health and wellbeing and opportunities to strengthen the relationship, connection and/or reconnection between Aboriginal people and their Country, can be a core contributor to closing the gap in disease and mortality for Aboriginal people. Contributions by government to reduce the health inequalities that continue to be experienced by Aboriginal people require recognition of non-western conceptualisation of the determinants of health and wellbeing such as traditional ways of knowing, doing or being (Terare and Rawsthorne 2020).

Policy and research opportunities

A range of state-wide and national policy areas align with and reinforce the important role of this *Connection to Country for Aboriginal Health and Wellbeing* Focus Area of the Healthy Parks Healthy People SA Agenda. These include:

- The (2020) renewed National Agreement on Closing the Gap. Many of the targets recognise Aboriginal people's integral relationship to their land. One of the 16 targets of the renewed strategy is *Aboriginal and Torres Strait Islander people maintain a distinctive cultural, spiritual, physical and economic relationship with their land and waters*. Specifically, the target sets out to achieve (by 2030) a 15 per cent increase in Australia's landmass subject to Aboriginal and Torres Strait Islander people's legal rights or interests.
- The SA Government Aboriginal Affairs Action Plan 2021-2022
- The SA Closing the Gap Refresh and reform processes
- Where appropriate using the *Joint Statement of Action: Connection to Country for Aboriginal Health and Wellbeing* to advocate for Connection to Country principles being more explicitly embedded in the future state-wide policy planning and the Reconciliation Action Plans of all South Australian Government agencies.
- The Green Adelaide/Kaurna Advisory Group (Warpulai Kumangka – translated from Kaurna meaning Working Together) ensures that Kaurna world views are embedded into all Green Adelaide Business. It creates a mechanism for systemic change which opens up opportunities for all to build a stronger, spiritual, connection to Country. Through a series of Camps, field trips and workshops, Warpulai Kumangka is providing an avenue for access to parks, reserves and other spaces, where Elders can pass down knowledge to the next generation. This knowledge is also shared with the wider community so that everyone is able to take on the responsibilities of caring for Country.

“If you care for Country, the Country will care for you”

Rodney O'Brien
Kaurna Elder





Case-study: Connection to Country

In 2020 Healthy Parks Healthy People SA sponsored a Connection to Country project as part of the Adelaide 100® trail development, being led by Walking SA. The Adelaide 100® is a loop walking trail of 100km that takes in the coast, waterways and hills of Adelaide. Walking SA has been working with Aboriginal leaders to identify opportunities for incorporating cultural knowledge along the trail, including signage and recognition of cultural elements.

The project involved the identification of a river red gum that could be carved as a Shield Scar Tree and signified along the trail to highlight this cultural practice and remind walkers that they are on Kurna Country. A Wokali (bark shield in Kurna language) is a powerful symbol of identity in Kurna culture. Projects like this create opportunities to:

- Engage local councils along the trail to participate in important Kurna cultural practices
- Support Kurna elders to pass on cultural knowledge to younger community members and support cultural leadership in the next generation
- Create a dedicated site to showcase the cultural practice with and language through signage which educates the wider public on Aboriginal culture.

Demonstration of the practice of carving a Kurna Shield is an opportunity for the passing down of cultural knowledge to the next generation of Kurna community. Sharing this knowledge is integral to the preservation of culture and an opportunity for Aboriginal people to engage in practices that connect them to their Country. Inter-generational knowledge sharing, to foster emerging leaders in Aboriginal communities, is a strong theme that emerged through the development of the *Joint Statement of Action: Connection to Country for Aboriginal Health and Wellbeing* (Joint Statement of Action 2019), which has been supported through the Healthy Parks Healthy SA People Program.

This is one of many examples of how the program can provide a basis for establishing new or supporting existing projects to promote the importance of Connection to Country for Aboriginal Health and Wellbeing.

Focus Area 4: Community health and wellbeing in a changing climate

South Australia is becoming hotter and drier, with rising sea levels and more frequent and intense heatwaves, bushfires, storms and floods. These changes are projected to increase in the coming decades (Department for Environment and Water 2020).

The changing climate presents a number of risks for health and wellbeing (Department for Health WA 2008) including:

- Impacts to physical and mental health as a result of more frequent drought, bushfires and other extreme weather events
- More heat-related illness and deaths
- Changes in mosquito-borne and foodborne disease
- Effects on asthma and cardiovascular disease due to changes in allergens and air pollutants
- Impacts to food production and nutritional quality
- Increased demands on health and emergency service.

While these risks will have implications for all parts of society, some population groups are more vulnerable (Department for Health WA 2008) including socio-economically disadvantaged communities, remote and rural communities, older people, children, pregnant women and unborn children, people with disabilities and/or chronic health conditions, outdoor workers and tourists who may be inexperienced with the South Australian environment and climate.

Understanding the risks, identifying at risk members of the community and developing appropriate adaptation strategies will continue to be a focus for South Australia's health and community services.

Parks have an important role to play in managing and adapting to climate change, by cooling the environment, providing essential habitat and refuge for native flora and fauna, providing opportunities to capture and store carbon, and supporting ecosystem services such as improving water quality, pollination and pest management.

Increasing temperatures, sea level rise and changes in rainfall patterns will lead to changes in habitats and the abundance, distribution and

composition of native species. Existing pressures from weeds and introduced pest animals may also be exacerbated. Harsher fire weather poses a significant risk, with the 2019-20 bushfires illustrating the vulnerability of our parks and native ecosystems in a changing climate (CSIRO 2008).

Policy and research opportunities

The SA Government's efforts to reduce disaster risks associated with natural hazards are guided by *The National Disaster Risk Reduction Framework and Strategy*. The government also supports community resilience through *Stronger Together: South Australia's Disaster Resilience Strategy*.

In December 2019, the *Directions for a Climate Smart South Australia* which guides climate smart planning and action across government was released, closely followed by the *Blue Carbon Strategy for South Australia* and a new *South Australian Government Climate Change Action Plan 2021 - 2025*.

The SA Government actively manages the state's national parks, marine parks, and reserves to maintain healthy habitats and give flora and fauna the best chance to adapt to climate change. A key focus is to reduce the pressure of existing threats such as invasive species and inappropriate fire regimes to give species and communities their best chance of adapting and evolving. There are also opportunities to manage parks to increase stores of carbon within native vegetation.

Local governments are actively managing community parks which help to cool urban areas, improve biodiversity and promote the health and wellbeing of the community. State and local governments are working together to increase urban tree canopy cover and generate more of the green spaces our communities and wildlife need.

Further opportunities to protect and promote our environment and the health of our parks and nature, for community health and wellbeing benefits will be explored in the future.



Case-study: Smart and efficient water use contributing to community health and wellbeing

SA Water is collaborating with 19 Adelaide councils to help maintain cool, green open spaces that build healthy communities.

Leading this initiative is the smart irrigation system, which takes and transmits real time data from soil moisture probes, daily weather forecasts and SA Water smart meter data.

SA Water puts this data through a sophisticated algorithm to determine the right amount of water to use, at the right time.

Councils involved are already starting to see cost and water saving benefits, and based on this success to date, SA Water is looking to expand the technology to more areas of South Australia.

To demonstrate the cooling benefits of a well-irrigated public open space, SA Water have also installed more than 200 air temperature sensors in public parks and playgrounds

around Adelaide. Readings are updated every 15 minutes and displayed live in an interactive map at sawater.com.au.

This shows the positive impact of creating cool public spaces, which people can safely enjoy during warmer weather.

The principles being used to cool and green public open spaces can also be applied in your own backyard. A quick 30 second spray, or 'flash-watering', of your lawn or a leafy canopy can reduce air temperatures in your garden for about half an hour.

Misting systems can also reduce air temperatures by up to 20 degrees, and giving your garden a good soak two days before a heatwave will help it survive and keep it cooler. This shows that with just a little bit of water, you can cool your home and enjoy the outdoors longer.



Focus Area 5: Nature education and childhood development

While all population groups can benefit from contact with nature, specific groups benefit in different ways, particularly children. Importantly, evidence demonstrates that giving children opportunities to learn, live and play in natural spaces is positively associated with good physical, mental, social and spiritual health in adult years (Sugiyama 2012).

For children, engaging in nature can support creativity and problem solving. Studies of children in schoolyards found that children engage in more creative forms of play in green areas and also play more cooperatively. Play in nature is especially important for developing capacities for creativity, problem solving and intellectual development (Kellert 2005).

Nature enhances cognitive abilities in children too. Evidence shows that exposing children to parks provides them with opportunities for engagement, fun and education (Blanchett-Cohen & Elliot 2011). Additionally, it is well established that opportunities to play in parks allow children to

explore the diversity of protective factors offered by experiencing nature, including capitalising on the chance to practice reasoning, reaction, observation, logic, attentiveness, and responding to the environment and people. Studies also show that nature can enhance academic performance for children. Studies in the United States show that schools that use outdoor classrooms and other forms of nature-based experiential education support significant student gains in social studies, science, language arts, and math. Students in outdoor science programs improved their science testing scores by 27 per cent (American Institute for Research 2005). Contact with the natural world can also significantly reduce symptoms of Attention Deficit Disorder (ADD) in children as young as five years old (Kuo & Taylor 2004).

Research has shown that having access to parks increases physical development and activity. It encourages simple and complex movements (climbing and jumping) that engage different muscle groups to those developed during other types



of play. Research also shows that children with access to natural green spaces receive greater physiological benefits than those that play indoors (Duncan et al. 2014) and are less likely to be overweight or obese than children without access to parks (Blanck et al. 2012; Schaefer et al. 2014).

Nature also enhances learning and spiritual growth in children with disabilities. Zhang (2010) notes the potential benefits of nature contact in education for children with disabilities: “Encounters in nature with plants and animals foster spiritual sensitivities and help children to learn qualities such as empathy and compassion and to develop a sense of wonder” (Zhang 2010). Spiritual development arising from these experiences can foster “hope, healing and growth”.

Access to green spaces, and even a view of green settings, enhances peace, self-control and self-discipline within inner city youth, and particularly in girls (Taylor, Kuo & Sullivan 2001). Green plants and vistas also reduce stress among highly stressed children. Locations with a greater number of plants, greener views, and access to natural play areas show more significant results (Wells & Evans 2003).

Finally, access to parks is particularly relevant for children who may be in families experiencing social or economic disadvantage. The assertion that absence of safe parks and outdoor spaces directly impacts children’s mental health is supported by evidence that highlights the particular vulnerability of children in low socioeconomic areas (Sturm & Cohen 2014).

This growing awareness of the benefits of our connection with nature highlights the importance of accessibility to it. It also supports the need to maintain not just notionally green spaces but wilder areas where ecological and natural systems can be allowed to flourish. These more natural places provide greater levels of wellbeing but they also create a more interesting, cooler and resilient landscape.

Urban infill, increasing population and higher density living is making access to natural places harder to achieve. Time in nature for many is now likely to involve green spaces such as manicured parks and sporting ovals. However, evidence of the need for nature now indicates that the wilder the nature experience young people have, the greater the benefits it provides to their support for environmental values and actions later in life (Wells and Lekies 2006).

Policy and research opportunities

There are many opportunities for collaboration between the Health and Environment sectors in South Australia to better promote the positive opportunities that nature provides for childhood development through to lifelong health and wellbeing outcomes.

Childhood development continues to be a growing area of policy and research interest within preventative health. The ‘Early Years’ are identified as one of three key priorities in the Wellbeing SA Strategic Plan 2020-2025. Many health problems have their origins in the early years of a child’s life;

the first 1000 days (from pregnancy to a child's second birthday) are recognised as a unique window of opportunity for brain development and setting up the foundations for lifelong health and wellbeing. Wellbeing SA is strongly committed to working in partnership to ensure that children have the best start in life.

Green Adelaide funds a nature education program, which is underpinned by three key principles that aim to develop positive environmental attitudes, empathy and stewardship toward the environment that will encourage the development of skills and capacity for future generations to take action in:

- 1. Lifelong learning** recognises the importance of acquiring knowledge and skills about the natural environment across all stages of life.
- 2. A focus on the local natural environment as part of a system** recognises the benefits of connecting people to nature through connection to places that are in proximity to where they live/spend time while recognising we are part of a larger system.
- 3. Time spent in nature and immersion** recognises there is a need to spend time in nature in order to enhance learning, understanding and appreciation of our connection to nature, our place in it and the ways in which our actions positively or negatively impact it.

In response to COVID-19 in April 2020 Nature Play SA released a free online guide to support SA families through the pandemic. It focused on: mental health services and support; tips on continuing to be physically active; tips on eating healthy; practical ideas to do at home; ways to keep connected with friends and family; and creative ways to spend time in nature every day. The July 2020 school holidays saw Nature Play SA deliver the highly successful *#ItsBetterOutside* online campaign. The objective of the two-week campaign was to get kids and families active, spend more time outdoors and discover some of South Australia's unique natural spaces.

“Healthy people have always been dependent on healthy environments, and parks offer us the opportunity to recapture some of that historical relationship”

Professor Philip Weinstein
School of Public Health
University of Adelaide





Case studies: Nature based environmental education

Building values for nature into the lives of our children and young people now will ensure that our communities will continue to benefit from and advocate for the retention and inclusion of greenery in our living spaces in the future. Research shows that if young people develop the skills and knowledge to understand and care for the environment they will be more likely to maintain lifelong empathy and values for it (Chawla 2018). As future decision makers, young people need to understand both the benefits to our wellbeing and our

interconnectedness and reliance on intact ecosystems as human beings.

Nature based environmental education effectively increases ecological behaviour by fostering connectedness to nature and environmental knowledge (Otto and Pensini 2017) In doing so, nature-based environmental education seems to be a highly effective way of promoting the development of an ecological lifestyle that affects a broad range of ecological behaviours.

Our Big Backyard

Our Big Backyard is a nature-based community development project that connects people with their local area while building family and community relationships and a deeper understanding for their natural world.

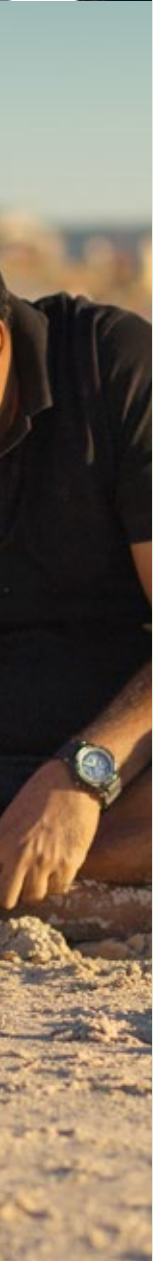
The project was first developed for the Aldinga Beach area in 2011 in partnership with the City of Onkaparinga, Aldinga Beach Community Children's Centre and Anglicare SA Communities for Children. The project is now running in Christies and O'Sullivan Beach, Hackham, West Torrens and Tea Tree Gully with Green Adelaide, local government and other agencies as key stakeholders.

The Our Big Backyard kit includes; a map of the local area identifying natural spaces to explore; a checklist of 50 things to do in the local area which are all fun, free and outdoors; and nature adventure sheets or activity cards with nature play ideas, tips on how to care for the local environment and interesting information about local native plants and animals.

The project has several wellbeing aims including:

- Increase pride, community identity, belonging and ownership in the local area
- Valuing parents/caregivers as the first educators, by giving adults the confidence to visit, learn and play in nature
- Deeper connection to and understanding of local Kaurna culture
- More frequent and positive experiences in our local natural environment
- Families connecting with their own communities through shared experiences and events
- Learning through nature as an organic and spontaneous teacher
- Support all families including those with low socioeconomic backgrounds by making the kit free, requires no preparation and accessible by public transport

Parents and caregivers surveyed who participated in Our Big Backyard Christies said: *"I wasn't aware that there were such beautiful places like the wetlands etc so close to home."*, and another parent/caregiver commented that *"The children and myself have more insight into the habitats of the wildlife and how we can conserve the beauty of their habitats."*





Focus Area 6: Green infrastructure in urban settings

Urban greening is a vital part of an equitable solution to a range of social and health issues that South Australia faces such as hospital demand, and the disproportionate burden of disease among subgroups of the population. Improving the quantity and quality of green infrastructure is an example of an ‘upstream’ intervention to improve health for all, rather than targeting individuals through behaviour change (Freudenberg et al. 2015). Street trees and urban green space are valuable resources for tackling health inequalities (Twohig-Bennett and Jones 2018; Hunter et al. 2019) and ensuring equity of access to offset potential effects of gentrification (Cole et al. 2017). Urban green space interventions provide opportunities to interact with nature and quality green open space, enabling all South Australians to experience the health and wellbeing benefits.

Definitions:

In this document, green infrastructure is used to describe the networks of vegetation and water systems in urban areas across the public and private realms. It incorporates public parks and waterways, public and private gardens, trees, greenways, street verges and open space pockets in streets, sports facilities, native remnant vegetation and engineered forms like rain gardens, green walls and roofs. Urban greening refers to the investments in green infrastructure in urban environments, such as trees, parks, and landscaped areas that create mutually beneficial relationships between people and their environments.

Research evidence on green spaces and physical health, mental health, and ecosystem health has increased significantly over recent years (Zhang et al. 2020). Whilst the various underlying mechanisms and pathways are still under study, the quantity, quality, and characteristics of green space for public health is now well established. Trees, beyond their amenity and biodiversity value, provide critical services that help make cities healthier and more liveable. The health and wellbeing benefits of urban trees and other green infrastructure can be categorised as capacity restoration (mental health, stress reduction, and clinical health outcomes), capacity building (birth outcomes, active living), and harm reduction (air pollution, ultraviolet radiation, heat exposure) (Wolf 2020).

Capacity restoration

Recent evidence unequivocally confirms that green infrastructure contributes positively to physical health and better self-reported health (Twohig-Bennett and Jones 2018). Trees, particularly street trees and streetscapes with tree canopy cover, are a critical element for population health, with evidence suggesting that higher exposure to trees outside of parks may be associated with better health (Reid et al. 2017) and mental health (Taylor et al. 2015). Reviews of research evidence confirm that green infrastructure is associated with obesity prevention (Davern et al. 2017; Ellaway, Macintyre and Bonnefoy 2005), reduced blood pressure and heart rate (Twohig-Bennett and Jones 2018), and reduced incidence of type 2 diabetes and stroke (Twohig-Bennett and Jones 2018). Long-term studies have also demonstrated that people living in neighbourhoods with greater greenspace live longer and healthier lives, with outcomes of reduced incidence of cardiovascular disease risk (Dalton and Jones 2020) and reduced all-cause and cardiovascular mortality (Rojas-Rueda et al. 2019; Gascon et al. 2016).

Green infrastructure benefits our mental health and wellbeing including lower depression, anxiety and stress (Sugiyama et al. 2016). These effects can be achieved if a minimum of 20 per cent vegetation

cover is met, with a dose-response relationship for increasing vegetative cover (Cox et al. 2017). Individual studies have highlighted benefits of stress reduction, relaxation and restoration, and better recovery from acute stress and mental fatigue (Gascon et al. 2015). Among children and adolescents, increased green space exposure in urban environments can contribute to reduced stress, positive mood, less depressive symptoms, better emotional wellbeing and decreased psychological distress (Zhang et al. 2020). Lower rates of prescription of anti-depressant medications have been found in areas with higher urban street tree density (Taylor et al. 2015). Among children and adolescents, green space contributes to reducing emotional and behavioural difficulties, particularly hyperactivity and inattention problems (McCormick 2017; Vanaken and Danckaerts 2018), and reduced aggressive behaviours (Younan et al. 2016). “Green time” may also buffer consequences of high screen time (Oswald et al. 2020).

Green space can enhance quality of life and empowerment for people living with dementia, in spite of cognitive decline (Mmako et al. 2020). Positive associations exist between species diversity and wellbeing (psychological and physical), and between ecosystem diversity and immune system regulation (Fong et al. 2017).

Capacity building: Active Living

Physical activity engagement is influenced by a range of individual and accessibility features, and until recently, evidence of impacts of green space has been mixed, particularly in place-based interventions. However, across experimental and longitudinal studies, a positive association between urban green space exposure and physical activity is demonstrated. Time spent in urban green space is positively associated with moderate-to-vigorous physical activity which becomes greater with higher quantity of residential green space and is greater in gardens and streets rather than in other environments. Population-wide surveys from Adelaide have also found that walking is associated with green space exposure (Sugiyama et al. 2013).

Capacity building: Birth Outcomes

Studies comparing high and low greenspace exposure also demonstrate decreased risk of preterm birth and small size for gestational age births (Twohig-Bennett and Jones 2018; Kondo et al. 2018; Dzhambov and Dimitrova 2014). Child physical and cognitive development is also improved through time spent in nature, physical activity and motor skill development through outdoor play (McCormick 2017).

Harm reduction

A number of harms to human health are mitigated due to trees and green space, like safety, air pollution, UV radiation, and heat exposure.

Benefits of capacity building and harm reduction are evident in improvements in social cohesion and safety. The presence of urban green spaces can encourage positive social interactions that cultivate social cohesion in ways that enhance health and wellbeing (Jennings and Bamkole 2019). Green space interventions such as greening vacant lots have shown reductions in total crimes, violence and increased perceptions of safety in urban settings (Twohig-Bennett and Jones 2018; Shepley et al. 2019).

Trees and urban forests in particular are effective in removal of air pollutants, buffering of traffic-related air pollution and improved air quality (Wolf et al. 2020; Zhang et al. 2020). This can contribute to improved respiratory health under some circumstances. Trees, particularly bigger trees, can reduce exposure to ultraviolet radiation (Wolf et al. 2020). Importantly, green urban spaces (including trees, grasses and other surface planting) can act as 'air conditioners' in the urban environment.

There is strong evidence that trees and increased vegetative cover reduce both air and surface temperatures, provided by plant transpiration and shading. This is a risk-mitigating factor for heatstroke and other negative health effects of extreme heat (Wolf et al. 2020). Additionally, vegetation irrigation has been shown to reduce air temperature by approximately 1°C and increase human thermal comfort¹ by up to 10°C (Motazedian,

Coutts and Tapper 2020; Ossola, Staas and Leishman 2020). Mitigation of urban heat stress is also important considering the links to exercise avoidance at comparatively low temperatures, where Australians curtail their physical activity in warmer weather (Lopes 2016).

Improved quality and quantity of green infrastructure can strengthen the resilience of towns and cities to respond to the major current and future challenges presented by complex issues such as population growth and climate change. Green infrastructure also provides return on investment as a structural asset, which provides benefits for people, communities and for the environment.

Policy and research opportunities

Fundamental to building and maintaining green infrastructure and providing quality green open space is the recognition of ecologically sustainable approaches to urban design, balancing the built and natural environments with social and economic imperatives. Mitigating the impacts of increasing urban infill and influencing developers and property owners to make space for green infrastructure in the private realm (both residential and commercial) continues to be a key policy challenge. Existing and planned strategies highlight some new and ongoing opportunities for collaborative action in the quality green public space agenda:

- The 30-Year Plan for Greater Adelaide acknowledges that as urban Adelaide continues to grow and develop, the quality of urban green space becomes increasingly important to protect and promote population health and wellbeing, with associated targets focussing on green spaces and streets providing healthy liveable communities.
- Through the new Planning and Design Code and the upcoming Green Adelaide five year plan, the SA Government continues to be committed to addressing imbalances in green open space caused by urban infill, and pressures on the biodiversity, amenity, accessibility, comfort and resilience of green open spaces.

¹ Human thermal comfort (HTC) is a term used to describe a person's satisfaction with the surrounding thermal conditions.

- Green Adelaide is focused on enhancing greening of local government parks and reserves and suburban streets. Green Adelaide will continue to support local councils to provide green infrastructure and water sensitive design and to seek new solutions to urban density issues that reduce the availability of spaces for trees.
- Strong commitment to improving access to green spaces - particularly for residents of metropolitan Adelaide, where access to wild natural experiences can be limited - through:
 - The proclamation of Glenthorne National Park-Ityamaiitpinna Yarta, Adelaide's second metropolitan national park.
 - Opening up suburban reservoirs as an extra recreational resource to enhance community access to and connection with nature.
 - Exploring a collaborative process for Adelaide to become a National Park City, which recognises the value of urban life, habitats, landscapes, and people and culture. It seeks to apply appropriate national park principles to whole cities to improve many aspects of urban living.

Ultimately, greater cross-sector cooperation is required to respond to the values associated with the provision of quality green open public spaces across Greater Adelaide. At a metropolitan scale, government departments can work collaboratively to integrate strategy, policy, funding and assessment to better manage the quality and the expansion of public spaces.

The importance of quality green open spaces that connect communities with nature was highlighted by the measures the Commonwealth and State Governments undertook in response to the COVID-19 pandemic in 2020. During this time, South Australian parks remained open for day visitors, providing opportunities for recreation as well as promoting community health and wellbeing.





Case study: Quality Green Open Space Collaboration, in action

Through Healthy Parks Healthy People SA, Wellbeing SA and the Department for Environment and Water are collaborating with industry partner Australian Institute of Landscape Architects – SA chapter and the Attorney-General's Department (Office for Design and Architecture SA and Planning and Land Use Services) to enhance the quality of green open space in South Australia.

A major commitment arising from this partnership is the Quality Green Open Space Reference group, and Quality Green Open Space Action Plan 2020-2022. The reference group (established 2016) continues to work collaboratively to plan and implement actions in the plan. The reference group involves multiple agencies, non-government organisations (NGO), and local governments.

As part of this plan, through collaboration with the Australian Institute of Landscape Architects (AILA), six key principles for quality green open space were identified to protect and enhance existing green spaces alongside the creation of new open space destinations.

Principle 1: Promote community health and wellbeing

Principle 2: Connect with nature

Principle 3: Build stronger communities

Principle 4: Deliver connectivity and access for all

Principle 5: Contribute to neighbourhood character

Principle 6: Support resilient neighbourhoods

In April 2019, these principles were developed and published as: *Creating Greener Places for Healthy and Sustainable Communities: Ideas for Quality Green Public Space in South Australia*. This document defines the six principles, describes the environmental, health and wellbeing outcomes of each and provides examples of design responses to meet each principle.

By government, industry and local government working together, and by utilising evidence-informed best practice principles, we can help to promote high-quality green spaces that join destinations, streets, public transport neighbourhoods and our city. Such collaboration enhances health, liveability, diversity, accessibility, viability and sustainability and contributes to South Australia's growth and prosperity.

Focus Area 7: Biodiversity, conservation and human health

Environmental biodiversity and human health and wellbeing are linked in many ways. Human life depends on ecosystem products and services such as the availability of fresh water, food and fuel sources for good health and productive livelihoods. People depend directly on ecosystems in their daily lives, including for the production of food, medicines, timber, fuel and fibre. A more recent body of evidence is demonstrating relationships between a healthy immune system, microbiome and exposure to biodiversity. Recent research shows direct links between exposure to green spaces and reduced mortality, cardiac health, healthier babies, and mental flourishing, with pronounced effects among marginalised communities (World Health Organisation 2016).

The connections between environmental biodiversity and human health and wellbeing are well established, with more research continuously emerging. The World Health Organization and Convention on Biological Diversity (2015) highlights specific ways that richly biodiverse environments improve human health and wellbeing:

- **Air and water quality:** Healthy, functioning ecosystems provide clean water and can contribute to improved air quality through natural filtration processes. All terrestrial and freshwater ecosystems play a role in underpinning the water cycle, including regulating nutrient cycling and soil erosion. Many ecosystems also play a role in managing pollution, as their water purification services underpin water quality.
- **Agriculture and food security:** Biodiversity in and around agricultural production systems makes essential contributions to food security and health. In particular, pollination is essential to food security generally and to the production of many of the most nutritious foods. Access to wildlife in terrestrial, marine, and freshwater systems is critical to human nutrition, and global declines will present major public health challenges.
- **Immune system functioning:** Evidence shows a direct relationship between exposure to natural environments and the maintenance of a healthy human immune system. The immune system needs an input of microbial diversity from the natural environment to establish the mechanisms that regulate it. When this regulation fails, there may be immune responses to undesirable targets such as our own tissues (autoimmune diseases; type 1 diabetes, multiple sclerosis), harmless allergens and foods (allergic disorders, eczema, asthma, hay fever) or gut contents (inflammatory bowel diseases, ulcerative colitis, Crohn's disease). Urbanisation and loss of access to green spaces are increasingly discussed in relation to these non-communicable diseases.
- **Infectious diseases:** Human-caused changes in ecosystems, such as modified landscapes, intensive agriculture, and antimicrobial use, are increasing infectious disease transmission risks and impact. Approximately two-thirds of known human infectious diseases are shared with animals, and the majority of recently emerging diseases are associated with wildlife. Vector-borne diseases also account for a large share of endemic diseases. Increasing human activity is facilitating disease spread through increased opportunities for contact at the human/animal/environment interface, and changing vector abundance, composition, and/or distribution. Changes in land use and food production practices are among leading drivers of disease emergence in humans. At the same time, pathogen dynamics are changing. While pathogen evolution is a natural phenomenon, factors such as global travel, climate change, and use of antimicrobial agents are rapidly affecting pathogen movement, host ranges, persistence and virulence. Beyond direct infection risks for human and animals, such changes also have implications for food security and medicine.

- **Potential new medicines:** For many of the most challenging health problems facing humanity today, we look to biodiversity for new treatments or insights into their cures. Medicinal and aromatic plants, the great majority of which are sourced from the wild, are used in traditional medicine and in the pharmaceutical, cosmetic and food industries. The global use and trade in medicinal plants and other biological resources, including wildlife, is significant and growing.
- **Ecosystem and social resilience:** Biodiversity helps to improve the resilience of ecosystems, boosting their ability to adapt to climate change and moderating the impacts of disasters. It also helps create societies that are more resilient to disasters and change. Ecosystem-based adaptation and mitigation strategies are needed to build the resilience of managed landscapes and jointly reduce the vulnerabilities of ecosystems and societies that rely on functioning ecosystems for their health, livelihoods and wellbeing. The conservation and use of genetic resources in agriculture, aquaculture and forestry is important to allow crops, trees, fish and livestock to adapt to climate change.

The UK Department for Environment, Food and Rural Affairs (2017) affirms that there is strong evidence linking the development of a healthy microbiome to direct contact with nature. The human microbiome refers to a population of around 10,000 species of micro-organisms that live within the body. As babies are born essentially sterile, exposure to diverse natural habitats is critical to develop a healthy microbiome.

Further evidence relates to green infrastructure in urban areas. Green infrastructure can reduce noise exposure and exposure to ozone levels, exposure to particulates and mitigate the harmful effects of air pollution (Kumar et al. 2019). Living in environments with a greater percentage of natural features around the residence is associated with reduced mortality for specific population groups including men, infants and lower socio-economic groups (DEFRA. 2017). Exposure to green space during pregnancy is associated with foetal growth and higher birth weight (Cusack et al. 2018). Rates of obesity tend to be lower among populations who live in greener

environments. People across eight European cities were shown to be 40 per cent less likely to be obese when living in the greenest areas. Green space may also help to reduce the prevalence of type 2 diabetes (World Health Organisation 2016).

Exposure to natural environments has also been linked with more favourable cardiac health including heart rate and blood pressure, vitamin D levels, recuperation rates and cortisol levels (DEFRA. 2017).

A strong and consistent evidence base exists for improved mental health and wellbeing indicators arising from exposure to natural environments, including reductions in stress, fatigue, anxiety and depression and improved social cohesiveness. The evidence indicates that these benefits may be most significant among marginalised groups of humans (DEFRA. 2017).

Consideration of the linkages between biodiversity and nutrition and health is also an important area of emerging recognition globally. With a view to support countries in a necessary transition toward healthier, more sustainable diets by integrating biodiversity in food-based interventions to support nutrition and health, WHO released *Guidance on Mainstreaming Biodiversity for Nutrition and Health* in 2020. The guide recognises that biodiversity at every level (genetic, species and ecosystem) is a foundational pillar for food security, nutrition, and dietary quality. It is the basic source of variety in essential foods, nutrients, vitamins, minerals and medicines, underpinning life-sustaining ecosystem services. Biodiversity can play a more prominent role in planning for nutritional outcomes in various ways. For example, sustainable agroforestry practices can facilitate the production of nutritious fruits and plant products, sustaining livelihoods through more efficient production and increasing the diversity of products available in markets. Plant health and species biodiversity is being impacted by environmental threats associated with climate change (WHO 2020).

Policy and research opportunities

The commitment to research agendas exploring the linkages between biodiversity and human health and wellbeing continues to grow internationally. Emerging opportunities for collaborative action in South Australia could include taking action in response to the following recommendations:

- Development of cross-discipline metrics to quantify the economic and other benefits of human health and nature to understand the effectiveness of different policy and intervention options (DEFRA. 2017, pp.3-5).
- Better understanding of the ‘dose-response’ relationship between contact with biodiversity and health impacts, for both quantity and quality (DEFRA. 2017, p.3).
- Specific user-led activities and programs that prevent illness and increase human flourishing through contact with nature (DEFRA. 2017, pp.3-5).
- Communicating widely about the links between human health and biodiversity, using innovative story-telling approaches (Australian Committee for IUCN, 2020).

“Nature and human health are one and the same thing. Aboriginal people have always understood that, and science and policy makers are increasingly catching up.”

Craig Wilkins
Chief Executive
Conservation SA



Case study: Greening of Urban areas for health outcomes

Published in *Restoration Ecology* volume 28 S4.

University of Adelaide researchers have recently investigated 'microbiome rewilding' to understand whether the diversity of microbiota within urban green areas can be increased to provide health benefits such as immune system exposure.

The study found that a sample of revegetated and remnant woodlands contained more native plant species and a greater diversity of microbiota than other types of green spaces such as lawns and vacant lots. Spaces that had been deliberately revegetated ('rewilding') had similar microbiota to remnant woodlands, which indicates that rewilding can assist soil microbiome to recover into a more biodiverse state. The study represents the first evidence of this improvement.

There are dual benefits of spaces with rich microbial diversity. The more diverse the soil biodiversity, the more robust the ecosystem function. Microbial diversity also has a role to play in training the human immune system to fight non-communicable diseases. Human exposure to biodiverse spaces can potentially be used as a preventative health measure that would assist in addressing global burdens of disease.

Biodiverse soil and mental health implications

Published in *Science of the Total Environment* volume 701 20 January 2020.

University of Adelaide researchers conducted a randomised, controlled study which showed realistic exposures to trace-level dust from soil with high biodiversity having the effect of altering the gut microbiota in mice, with a particular organism being correlated with a reduction in anxiety-like behaviour in anxious mice.

This supports a premise that airborne exposure to biodiversity can influence the gut microbiome and overall health, and may explain beneficial associations between human health and exposure to green spaces that have not previously been explained.

The research strengthens the case for providing biodiverse green space that is readily accessible, as microbial exposures can contribute to public health gains in physical and mental health indicators. These studies add to the body of evidence showing positive links between biodiverse green spaces and human health outcomes, which provides incentives for planners and designers to explicitly design urban areas that facilitate access to green space.





Healthy Parks Healthy People SA 2021-22 Actions

Healthy Parks Healthy People SA is committed to leading and/or supporting the following activities throughout 2021-2022, which will drive the agenda of the second generation of the program.*

Healthy Parks Healthy People SA Physical Activity in Nature Action Plan

The action plan envisions that all South Australian's experience the health and wellbeing benefits of being physically active in nature. The objectives of the action plan are to:

- Increase the number of people in South Australia who pursue physical activity in nature
- Enhance the availability and accessibility of green and blue public spaces that support physical activity
- Increase equity in access to physical activity in nature - to increase the opportunities for vulnerable and disadvantaged communities to experience and be physically active in nature.

5 Ways to Wellbeing in Nature and Beyond Masterclass

That the Healthy Parks Healthy People SA working group will explore options to run the *5 Ways to Wellbeing in Nature and Beyond Masterclass* (originally scheduled for March 2020), with the goal to:

- Promote discussion, debate, awareness and collaboration amongst the environment and health sectors on nature and mental health benefits
- Establish a community or practice/interest in nature based mental health promotion
- Identify further opportunities to promote and/or reboot the 5 Ways to Wellbeing in Nature campaign, to continue to raise awareness of value of nature for positive community mental health.

Quality Green Space

That the Healthy Parks Healthy People Quality Green Public Space Working Group will continue to take carriage of and drive implementation of the Actions as outlined in the 2020-2022 Quality Green Public Space Action Plan.

Connection to Country for Aboriginal Health and Wellbeing

Under the banner of Healthy Parks Healthy People SA that the Connection to Country for Aboriginal Health and Wellbeing working group will continue to identify opportunities to support activities and embed the principles of the Joint Statement of Action Connection to Country for Aboriginal Health and Wellbeing.

* This is not an exhaustive list of activities for the program but are key items proposed throughout the consultation and scoping of this framework refresh

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Appendix 1: HPHP SA Program logic





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