Project description

Project summary

This project will codesign a research plan that will ultimately develop practical tools and methods that enable sustainable people-environment interactions in liveable urban, regional and remote communities by:

- minimising heat impacts and improving water security in urban, regional and Indigenous communities through built form, greening and water sensitive solutions
- understanding and improving people's connection to nature and people-species interactions in urban, regional and remote communities.

We will identify Department of Agriculture, Water and Environment (DAWE) and partner needs for a nature-based solutions research agenda in Australia, covering greening, heat minimisation, water sensitive design, threatened species recovery and caring for country with Indigenous communities across urban, regional and remote human settlements.

Research needs and priorities will be determined through a codesign process primarily with DAWE and other research users including state environment departments, the water sector, local government, NGOs and Indigenous communities. A synthesis of current research and practice and a stocktake of existing tools/methods will be undertaken. This project will deliver on commitments such as in *Australia's Strategy for Nature 2019-2030*, and will scope future research opportunities with the release of new policy such as the *National Climate Resilience and Adaptation Strategy*, due late 2021.

Project description

Increasingly, the links between the health of people and the health of ecosystems and the environment are being recognised in research, policy, programs and land management. These links are particularly salient in urban and regional communities where most Australian's live. Opportunities exist to deliver practical science to inform the rapid development taking place in urban areas (such as Melbourne's Fishermans Bend urban renewal project) and peri-urban growth areas on the fringes of large cities. Great strides have been taken in national and international research exploring these links between human wellbeing, and environmental and ecosystem health, including through the National Environmental Science Program (NESP). However, important research needs remain.

Emerging international research suggests that increasing people's connection to nature is required for effective species and ecological community management and recovery[1]. The need for understanding and improving this relationship is being written into policies and strategies at the national (e.g. *Australia's Strategy for Nature 2019 - 2030*), state (e.g. *Protecting Victoria's Environment - Biodiversity 2037*) and local (e.g. the *City of Melbourne's Nature in the City Strategy*) level. Changing environments and changing human populations are leading to the distancing of people from nature, and altered people-species interactions – sometimes leading to conflict with impacts on species (including threatened species) and human wellbeing. Much existing research is focussed on urban communities, but there is increasing recognition these issues affect regional and remote communities, perhaps in different ways. In an Australian context, fostering a greater connection with country in

[1] See e.g. Soga, Masashi, and Kevin J. Gaston. 'Extinction of Experience: The Loss of Human-Nature Interactions'. Frontiers in Ecology and the Environment 14, no. 2 (2016): 94–101. https://doi.org/10.1002/fee.1225.

Indigenous communities will support Traditional Owners, parks authorities and the broader community to access and care for country. A new research agenda to synthesise existing knowledge, identify research gaps, and explore these issues in the Australian context across urban, regional and Indigenous communities is needed.

Similarly, there is growing awareness of the effects of environmental change on human health and wellbeing. Heatwaves are Australia's most deadly natural hazard[2] and the intensity, frequency and duration of extreme heat is projected to increase with climate change. This impact will be exacerbated in built-up areas by the Urban Heat Island effect. Often considered an issue for higher density metropolitan centres, there is increasing awareness that impacts are also affecting suburban growth areas with increasing densities and activity nodes. Regional and remote communities are also affected by heat and risks to water supplies. For example, threats to the water supply of communities living near Uluru Kata-Tjuta National Park are exacerbated by climate change. The risk factors that define the sensitivity of populations to heat and water security-related health and wellbeing impacts are not evenly distributed. These risk factors are more prevalent in remote, elderly and low income populations, who often reside in older, poor quality housing, and in locations of high climate change risk, with few resources to invest in adaptation, highlighting issues of equity and fairness. These issues are being addressed by policy at all levels of government. As noted in a media release by Minister Sussan Ley on 25 January 2021, "climate adaptation is a top priority across all hubs in our upcoming NESP Programs". DAWE has flagged that it will be developing a new National Climate Resilience and Adaptation Strategy, due late 2021.

To identify, prioritise and address these research needs, we will codesign a new research agenda with DAWE and key research users including state environment departments and other Hub partners. We will use the lens of Nature-based Solutions (NbS) – a lens that is being adopted in global policy documents (e.g. the New Urban Agenda) and global standards developed by the IUCN, but is yet to be widely adopted in Australia. A NbS approach encourages transdisciplinary approaches to codesign and cocreation of research to address environmental, ecological and human health and wellbeing challenges. It fosters multiple environmental, ecological and social benefits, and promotes resilience of social-ecological systems to pressures such as climate change and urbanisation, and the shocks of extreme heat and storm events.

This project aims to codesign a series of impactful research projects in the Sustainable people-environment interactions (SuPErInteract) research theme for our Hub Research Plan 2 (RP2) and beyond, with DAWE and other research users, including state environment departments, the water sector, local government, NGOs and Indigenous communities.

To achieve this, we will undertake:

- a series of facilitated codesign workshops and focus groups, interviews and research user surveys to elicit and prioritise research needs covering urban, regional and Indigenous communities across Australia – with DAWE, state environment agencies / departments and other research user partners
- a review of the current state of knowledge on the multiple benefits of ecosystems and nature for biodiversity and human health and wellbeing in the scientific and non-scientific literature (including state of the environment reporting, government data including data on regional and remote communities), to inform the codesign process. This will update work completed in the previous NESP program with emerging research on microbiomes, the importance of nature in

[2] See e.g. https://ausemergencyservices.com.au/climate/weve-learned-a-lot-about-heatwaves/

response to the COVID-19 pandemic, the importance of nature in regional and remote communities, and new knowledge on the role of nature connection and participation in nature-based programs in achieving desired outcomes.

- Consultation on existing decision-making tools, knowledge products, and datasets relating to climate, health, water, built environment, building performance, and social and economic indicators to inform future knowledge needs and research planning in urban, regional and remote Australia. We will investigate the potential interoperability of tools and identify critical data gaps or constraints, and any factors that may limit data access or use.

We will build on our prior research in this area including:

- nature-based solutions and greening in urban and regional communities (Swinburne/UTAS/CSIRO)
- water-sensitive design policy and planning (Monash)
- urban ecology and human dimensions of natural environments, threatened species in human settlements (UTAS/CSIRO)
- heat mitigation and climate adaptation (CSIRO/UNSW/Monash/Swinburne/UTAS)
- people's connection to nature (UTAS/CSIRO/Monash)
- human-wildlife conflict (UTAS).

Our researchers are leading research in these areas nationally and are well connected to emerging research internationally. We have worked with our partners to inform and implement policy such as *Protecting Victoria's Environment - Biodiversity 2037* strategy and the City of Melbourne's *Nature in the City* and *Urban Forest* strategies.

We will identify research opportunities that link to the research of other hubs, including the Climate Systems Hub (heat and climate adaptation in urban and regional communities), Resilient Landscapes Hub (threatened species in human settlements, multiple benefits of nature connection) and Marine and Coastal Hub (protected areas, blue and green ecosystem services and health). Researchers from CSIRO and UTAS are well connected with other Hub researchers at their respective institutions. Addressing the research scope of the SCaW Hub has the potential to contribute to the mission of other hubs. For example, addressing heat in urban and regional communities could contribute to the Climate Adaptation mission of the Climate Systems Hub, and could benefit from expertise within the Climate Systems Hub. The links and opportunities will be identified early in the codesign process.

The primary focus of the activities in this research plan is to to codesign Research Plan 2 with DAWE and key research users in this impact priority area, such as state environment departments, as well as other partners including local government, the water sector, environmental NGOs, Indigenous communities and industry.

The research activities undertaken to inform codesign (e.g. reviews of existing knowledge and tools) will be translated into usable knowledge products (e.g. policy briefs, guidelines) to inform decision-making. The codesign process will identify the research user needs and activities that could be informed by these knowledge products in 2021 and beyond.

Pathway to impact

This section describes how the project will inform decision making and on-ground action, and the outputs that will be delivered to research-users throughout the life of the project.

Outcomes

The codesign process described in this research plan will be used to identify research needs that will be addressed to create impact through Research Plan 2 and beyond. As such, the pathway to impact for Research Plan 1 is largely limited to the codesign process, rather than direct impacts on policy, management or the environment. Although, we expect that the codesign process itself will create opportunities to inform policy, programs and management.

From the outset, we will embed a pathway to impact in our processes by engaging with research users across urban, regional and remote communities to identify clear research needs relevant to policy, programs and management, seeking participation and feedback on research plans, and translating knowledge products into usable forms.

The expected longer-term ouctomes of this project are:

- new partnerships across the consortia and partners to foster innovation and creative solutions to improve people-nature interactions across Australia
- federal, state and local governments will be better able to implement and report on policy (e.g. *Australia's Strategy for Nature 2019 - 2030*, *Protecting Victoria's Environment - Biodiversity 2037*), and report on international obligations (SDGs, Aichi targets)
- creating, enhancing, facilitating and maintaining positive people-environment interactions in urban, regional and Indigenous communities
- access to emerging nature-based research in the Australian context
- improved nature-based programs that lead to improved outcomes for people and for biodiversity
- an evidence base that supports policy and programs across 100[3] Australian cities and towns in urban and regional Australua, rather than a small number of large cities
- tools/models/platforms that support the creation of businesses/markets in 'climate adaptation services' and the associated jobs and export opportunities
- economic benefits – through more climate resilient greening species lists, reducing money wasted in planting/maintaining greenspace that is not resilient, to reductions in the cost of healthcare, productivity losses via management of heat-related health risk
- significant community benefits, stemming from the application of tools/models/platforms that enable better planning of our cities and towns, improving liveability, sustainability, resilience, and health and wellbeing.

Research-user	Engagement and communication	Impact on management action	Outputs
DAWE - Biodiversity Policy Section, Protected Species & Communities	The needs of research-users will be identified through the codesign process.	The policies, programs and plans and environmental outcomes that will be impacted through the implementation of Research	The main output of this project will be project plan(s) for Research Plan 2.

[3] As defined by the Australian Bureau of Statistics 'Significant Urban Area' geography.

Branch, Migratory Species Section, United Nations Organisations and International Environment Section, Biosecurity and Social Science	ABARES, Environmental Economic Accounts, Parks Australia, Waste Data Visualisation Project (WDVP) State environment departments Other nature-based research users e.g. Local Government Authorities, Royal Botanic Gardens Victoria, Nursery and Garden Industry Association, WSP (professional services firm), the water sector, North East Bioregional Network, Landcare Tasmania, Conservation Volunteers Australia and TierraMar Indigenous communities e.g., Tasmanian Regional Aboriginal Communities Alliance (TRACA)	Research users will be involved in codesign through workshops, focus groups, interviews, user surveys and feedback/review of research projects as they develop. They will help identify existing knowledge products and research projects (e.g. WDVP). Research users will help identify the format of knowledge products to foster their use in policy-making, planning and management. Where appropriate, research plans that involve research users in the coproduction of knowledge through the life of the research project will be designed. The codesigned Research Plan 2 will be developed with extensive input and feedback from research users. Research findings generated through RP1 (e.g. synthesis of knowledge and tools) will be communicated in ways that are accessible to research users e.g. reports, policy advice, presentations. The format of these will be determined after consultation with research users and Hub knowledge brokers.	Plan 2 will be identified through the codesign process. It is expected that these will include policy such as ^, Victoria's Biodiversity 2037, the *City of Melbourne's Nature in the City and Urban Forest strategies*. Our partners conduct programs such as conservation volunteering, landcare, nature festivals and large scale ecological restoration (NE Bioregional Network) in urban and regional communities that we will aim to understand and inform through 2021.	Additional outputs will be generated to support the codesign process. We have identified one output so far: - a report and policy brief reviewing the current state of knowledge (including grey literature such as state of the environment reporting) on the multiple benefits of ecosystems and nature for biodiversity and human health and wellbeing in urban and regional communities Additional outputs will be identified through the codesign process.
Additional outputs N/A			

Indigenous consultation and engagement

Indigenous communities, businesses, research users, and researchers are vital to successful Sustainable People-Environment Interactions projects in our SCaW Hub. Indigenous research aspirations will be identified by working with our indigenous partners (TRACA, Fisheries Research and Development Corporation Indigenous advisory group), in partnership with our Indigenous project leader (Rob Anders, UTAS). Each subproject proposed for RP2 will be assessed using the three category approach, which identifies projects as 3) sharing results with Indigenous groups; 2) two way sharing of skills and knowledge; and 1) cocreation of projects with Indigenous people. Opportunities to build capacity, employ Indigenous researchers and generate Indigenous leadership will be explored in all subprojects. The potential for Indigenous cultural and intellectual property (ICIP) will be explored through subproject design, and managed appropriately.