From little things big things grow: building connections through place-based education in the Tasmanian Midlands biodiversity hotspot.

The Tasmanian Midlands restoration work includes a multi-faceted educational program that connects schoolchildren, university students, researchers, artists and the community in the Midlands. Here, we outline this program and consider its many benefits and challenges through its five years of continued support.

Key words: place-based education, ecological literacy, interdisciplinarity, art-meets-science, community engagement, ecological restoration.

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Introduction

Ask any Tasmanian to describe the Midlands and they will typically describe it as an agricultural landscape with stark, dead gum trees, and lots of sheep. Most will only see the Midlands from the main highway, as ninety eight percent of the land is privately owned (Cowell et al. 2013). 200 years of European style farming has fragmented this dry landscape into small and scattered remnant patches of native vegetation. These remaining remnants are highly vulnerable to further habitat and biodiversity loss (Davidson et al. 2021, this issue). Few Tasmanians would know that the Midlands is one of 15 recognised biodiversity hotspots in Australia, and the only one in Tasmania (Australian Government 2020). Its importance is recognised as it includes 32 National and more than 180 State listed threatened species, including species that are, or are virtually, extinct on mainland Australia, such as the Eastern Bettong (*Bettongia gaimardi*), Spotted-tailed Quoll (*Dasyurus maculatus*), Eastern barred Bandicoot (*Perameles gunnii*), and the Tasmanian Devil (*Sarcophilus harrisii)* (Jones and Davidson 2016). This situation prompted the Tasmania Island Ark program (hereafter referred to as Island Ark), led by Greening Australia, and in partnership with the University of Tasmania, landholders and communities in The Midlands. The main focus of the Island Ark program is on-ground habitat restoration work, supported by research. A secondary aim is to engage with broader sectors of the community, in addition to those directly involved, to have the best possible chance of restoring and retaining habitats for endangered species in this region.

In this article we describe how a multi-faceted, educational program (Figure 1) has developed through an incremental process of forging connections between people, place, projects, and funding that values a diversity of contributions. We understand that,

> … [a] *place cannot be understood from the vantage point of a single discipline and specialisation. The study of place enables us to widen the focus to examine the interrelationships between disciplines and to lengthen our perceptions of time.* (Orr 2005, pp. 91-92)

We also contend there are benefits to be realised from a series of small, low-risk, and diverse projects to build the trust required for truly interdisciplinary educational programs and outcomes. Our story has a cast of many, anchored by a small collaborative group of pivotal educators, which includes science communicators, artists, philanthropists and landowners (Figure 2). The educational program has evolved into three main and interconnected entities championed by key people, namely:

1. The Bushrangers project (Nel Smit, Box 1) principally working in the formal kindergarten through to Year 12 school sector, locally and across the state, with indigenous students and leaders, and the broader community to incorporate meaningful biodiversity curriculum.
2. Science communication and outreach (Tanya Bailey) by doctoral and post-doctoral researchers working on Island Ark.
3. The Species Hotel project, involving Architecture and Design students in Sculptures (Louise Wallis) and the Game Lab (Mike Hornblow, Box 2).

Over time, these different projects have received support from a variety of funding bodies/sponsors, ranging from $2,000 for single events, to $60,000 for annual projects.

Place-based education and the Bushrangers project

The central motivation for the educational program is to create a sense of connection with, and compassion for, places in the Midlands through greater engagement (Ardoin 2006; Zylstra et al. 2014). Place-based education is an approach ideally suited to ecological restoration programs, as it emerges from the particular attributes of a place (geography, ecology, sociology), is inherently interdisciplinary and experiential, and connects place with self and community (Gruenewald & Smith 2007; Smith & Sobel 2010). Place-based education is not a new approach; its origins are in experiential learning theory which typically involves project work (learning-by-doing and critically reflecting on actions). It has been found to improve student's sense of place, self-efficacy, and responsibility; but, is dependent on its design and implementation (Cinera et al. 2019). Essentially,

the goal is to build onto and challenge a student's understanding of their 'place' through 'invested-doing'.

The catalyst to promote education linked to Island Ark began with the Bushrangers project (2014 -), through the support of the John Roberts Charitable Trust. Informal data gathering by Nel Smit (Greening Australia) demonstrated the need to help local communities connect with nature in this agricultural landscape. Engagement surveys conducted with teachers and school children in the Midlands catchment area (Campbell Town, Cressy and Oatlands Schools) revealed limited knowledge of the fragility and significance of the remnant native landscape. Only a few children (of 180 surveyed) could identify any of four critically endangered local native mammals; yet every child could identify the four African animals shown to them (Figure 3).

It is from these basic beginnings that the Bushrangers project emerged with the task of reconnecting schoolchildren (and by extension, their families) with learning about and, appreciating and caring for their local environment (Figure 4). Nel Smit coordinates Bushrangers and began with *Science* and *Sustainability* units linked to the Australian Curriculum. An important starting point was when students selected and focused on a square metre patch of land for a year (Smit 2020) and experienced/documented the changes over that time. Building on this notion of a close and ongoing focus on the land, students at Oatlands (led by a University of Tasmania Honours student) investigated the comparative diversity of ant species between remnant bush and agricultural land. Local school children also sowed seeds and planted trees that replicated the species being restored in Island Ark in their own school grounds. Students also worked alongside practitioners planting and caging trees (for protection from livestock and wallabies) on landowners' properties. Their work was informed and guided by the doctoral and post-doctoral researchers, under Tanya Bailey's oversight.

With levels of success and confidence growing, the Bushrangers project was extended to urban schools, and expanded its involvement within University of Tasmania to tap into the enthusiasm of new participants and leaders from different subject areas (such as geography and the arts). New activities/projects were encouraged when common interests intersected between Bushrangers and potential new partners, such as geography symposia/field days, wildlife monitoring, Aboriginal Immersion days, and big biodiversity days and nights out, which are now important annual events in the project. These are explained later in the article.

The geography symposia and field days involved all Year 11 and 12 students studying geography and environmental science in Tasmania. These activities are embedded in the curriculum and required students to research ecological restoration using the Midlands as a case study, then present their findings in reports or short in-class presentations. In a separate iteration for the University of

Tasmania, third year and Masters students studying Biological Conservation, Australian Landscape Change (School of Natural Sciences), and Conserving Nature in Landscapes (School of Geography and Spatial Sciences) also participated. Both groups identified the field-based activities as the highlight of their respective courses.

A wildlife monitoring component was funded by the Disney Foundation (which focuses on educating children about local wildlife). This allowed Campbell Town and Bothwell school students to use motion sensitive cameras to contribute to a study of animal movements in fragmented landscapes (Jones and Davidson 2016). The clearly excited students uploaded their collated data to the Tasmanian Natural Values Atlas, a database that provides authoritative and comprehensive information. Their findings were also reported back to landholders. This is indicative of place-based education, which encourages concepts to be taught using issues in the local community (in this case, using scientific methods to identify real-world local problems) (Sobel 2004).

Provision of immersion experiences to reconnect Aboriginal people with Country is another important development for Bushrangers. The initial incentive to engage local Aboriginal students in this landscape came from a display of Aboriginal artefacts, collected from the Midlands, in the Queen Victoria Museum & Art Gallery (Launceston). National Science Week Aboriginal Immersion days, and a community field day with Aboriginal elders, helped focus community awareness of the indigenous Tyerrernotepanner clan group's heritage and identity. The concept of "two-eyed seeing" (Bartlett et al. 2012) is employed, whereby learning includes both Indigenous and Western ways of knowing and shown to benefit conservation and restoration outcomes (Rayne et al. 2020). This approach has given students insights into current, local biodiversity issues across historical and cultural contexts, and also how to act in the future. (Box 1 and Figure 5). These learning experiences also support teaching of the first cross-curriculum priority in the Australian curriculum: *Aboriginal and Torres Strait Islander histories and cultures*.

The Bushrangers project has provided outstanding opportunities for doctoral and post-doctoral researchers in Island Ark to understand how to communicate their scientific investigations to different audiences. While there has been no formal science communication training, they have gained valuable practical skills within a supportive, interdisciplinary, and intergenerational environment. Involvement with the Bushrangers project has given them opportunities to become what McBride et al (2011) term 'Renaissance Scientists', by placing a key emphasis on the valuable combination of teaching, public communication and outreach.

Tanya Bailey, the science communication and outreach champion, explains how, collectively and individually, the researchers learnt how to present to and engage with primary school students,

often with the aid of props, such as stuffed toy animals with GPS collars, taxidermy birds and animals and native seeds, nuts and leaves (Figure 4b). She says, we have

> *… learned how to adapt our more traditional scientific presentations for time slots ranging from 5 minutes to 2 hours. In a language suitable for audiences of all ages and backgrounds, we have immersed and engaged a diversity of learners* (Bailey, pers. comm., 2020).

The concept of "community as a classroom" in place-based education (Sobel 2004) holds true for all participants.

The rich addition of the arts

The involvement of the arts discipline came a little later in the Island Ark partnership, following community meetings held by Greening Australia, and the University of Tasmania. It was agreed that utilising arts practices would broaden community outreach and communication methods. This approach acknowledged the resurgence in community arts in Tasmania (typified by events such as *Ten Days on the Island*, *Junction Arts Festival* and *The Unconformity*); it could also provide opportunities to boost local tourism. Professor Kit Wise and colleagues (2016) (from the Tasmanian College of the Arts) developed the curatorial concept to create and install a series of responsive artworks from art/science collaborations along the Macquarie River in Ross (a town in the centre of the Midlands).

Dubbed the 'Species Hotel', the project became another key component of the place-based educational program. It was delivered by the School of Architecture and Design, through a partnership with Kit Wise and his colleagues. Although it was by chance that the School of Architecture and Design first became involved with the Species Hotel project, it has developed into being embedded into the School's curriculum. There are two main parts to the 'Species Hotel' project: Sculptures and the Game Lab.

The Sculptures (Species Hotels)

The brief was collaboratively developed by the School of Architecture and Design with Kit Wise and Greening Australia from a single artwork, into 60 students designing and making four sculptural hotels (1m high x 1m wide x 3m tall) as a part of their curriculum. Four hotels were exhibited (2016) and then installed on site (2017), with permanent seating designed and installed in the field ready for a launch event in 2018. The site was a parcel of farmland that connected the town of Ross to the new tree plantings along the Macquarie river. All pieces were funded by The Ian Potter Foundation and in-kind sources. The aim of the Species Hotel Sculptures was two-fold: first to provide functioning habitat (hotels) for specific animals as the young Island Ark plantings develop around

them, and second, to raise community awareness of Island Ark through the students' designs of distinctive forms (MacDonald et al. 2020). The motivation to involve first year School of Architecture and Design students in this project was to expose them to complex interacting design problems of sustainability and land use, and to engage them in interdisciplinary collaborations with ecological researchers, practitioners, and school children. The School of Architecture and Design is already renowned for its Learning-by-Making projects, in which small objects/pavilions are designed and made, solely by the students, for community-based organisations (Salama 2015), so this was an exciting addition to students' learning.

Despite the prospect of no ongoing funding for the Sculptures project, Louise Wallis and Nel Smit worked to keep the project alive, as the opportunities it offered were educationally rich and fostered valuable exchanges. While securing funds, the partnership continued between students from the School of Architecture and Design and the local school students through holding the big day- and night-out activities. These typically involved students listening to short presentations by researchers and practitioners at the Ross Town Hall and exploring the site of the Sculptures through drawing, model making with clay, and identifying animal scats. The big night out allowed students to discover with scientists the nocturnal biodiversity of remnant bush on Midland farms through a walk.

A second generation of Sculptures was designed and installed in 2019 (Figure 6 and see YouTube clip), a third in 2020 and another is planned for late 2021. Over 495 people have been directly involved in the last five years: 310 university students, 84 school children, 20 educators, 18 scientists, ten artists, two landowners and many community supporters. Further networks and partnerships (state, national and international) have emerged from the presence of the Sculptures.

Louise Wallis and Nel Smit further expanded the remit of the Sculptures in 2020, working with a new partner, TasNetworks, to design eagle perches. These perches reduce potential Wedge-tailed Eagle contact with distribution wires on electricity networks and draws awareness to the plight of this local and endangered species. Prototype perches will be located beside the Midlands Highway near Ross, at the Sculptures walk and at a nearby black spot for eagle mortality. The prototypes will be monitored by school children, who will process data collected on raptors using a motion sensitive camera. This three-year funded project complements the Sculptures and highlights the value that interdisciplinary projects can bring to education, community awareness and, in this case (most importantly) the plight of the eagles.

The Sculptures project, in its various iterations, is highly regarded by School of Architecture and Design students, with graduates recalling it as a 'seminal' design learning experience, and that it

gave them the sense they were part of a something larger (Graduates pers. comm., 2018 and 2020). Such is the motivation, that 40 students volunteered to install the second generation of Sculptures (2019), six months *after* their grades had been finalised. This installation group also included four graduates from the first cohort (2016) and students who had just commenced their undergraduate studies. Academic colleagues also identify the Sculptures project as essential learning in the first-year curriculum and continued running the project, despite significant curriculum renewal and COVID-19 restrictions, in 2020. As another indication of its educational value, it was awarded a University of Tasmania Vice-Chancellor's Citation (2020), for providing outstanding student learning experiences.

Game Lab

In addition to the Sculptures, the Game Lab project was created to push boundaries in promoting public awareness and community participation in the Midlands restoration corridor. The Game Lab was created by Mike Hornblow, in concert with a keen undergraduate student and a group of Master of Architecture students. The team's aim was to represent the dynamics inherent to biodiversity and native-habitat restoration, in collaboration with primary and high school students, local artists and technology educators. Adopting a fictional identity – *Office for Play Ecologies* – they presented the Game Lab at the Junction Arts Festival (internationally-renowned in the community arts arena) in Launceston in 2017.

Installed in the Wilderness Society shopfront opposite the Festival Hub, the Game Lab took a performative approach, as a series of prototypes for playtesting. With 400 festival goers through the door over three nights, the intention was to create an open environment for experimentation, whereby people could experience local ecologies as something spontaneous and compelling; be that, for example, in the existential play of predator-prey relations, or human intervention and climatic impacts on native species. The challenge was threefold: to explore student interests while responding to diverse contexts; to involve community and industry partners in the project; and to arrive at an outcome that engaged others in the act of play and learning about the Midlands environment (Box 2 and Figure 7).

Unfortunately, Mike Hornblow, the leading protagonist, is now working overseas, and therefore the Game Lab has not had the same leadership to continue. The departure of key project champions can pose potential threats to the educational program; conversely, change can also provide opportunities to engage new players and ideas.

Creating intergenerational and interdisciplinary collaborations – STEAM

A crucial aspect of the educational program and its constituent parts has been its collaborative nature. Linking Bushrangers and researchers with the Species Hotel projects was a productive way to promote the connection between the arts and science in interdisciplinary and cross-generational contexts. This model is often described as 'STEAM education': integrating the arts with science, technology, engineering and maths. From the very beginning, local school students welcomed the university students to 'their place' and were encouraged to explore and share their nature experiences together. This set the scene for the introductory session, aptly named the 'big day out', when everyone came together in Ross to discover and learn through the designing process.

The design process begins by establishing the clients' needs, in this case the animals, by listening and asking questions of the scientists, visiting the site and speculating creative ideas. Both Louise Wallis and Mike Hornblow wanted to have their undergraduate and Masters students participate with young school children in this process through what is termed 'parallel play'. The involvement of young school children enhanced the university students learning, by freeing them from over-thinking, stimulating creativity, and by confronting assumptions about design and construction. Young school children are particularly infectious in role modelling optimism and undertaking creative play; inspiring older students to expand their conceptual boundaries. Young children could also be relied on to ask 'tough' fundamental questions of the research experts and student designers. This interaction also ensured the invited experts were clear and engaging, while not losing scientific detail. We found how introducing 'play' is both a great leveller in education and interdisciplinary teams, whereby all participants, regardless of age or expertise, can find their (useful) place in a creative environment.

Parallel play continued with both groups 'sensing the site' through activities of observing, drawing, and modelling with clay. The modelling of clay began as a quick and useful tool for school children to develop early design of animal habitats on site, and evolved in later iterations into the making of artistic 'bird seed pies' to provide 'room service' for native occupants of the Species Hotel Sculptures. These 'pies' were exhibited on the main street outside businesses (already famed for their edible pies) on oversized plates with forks and knives, to promote the Sculptures installation.

Another important part of the Species Hotel project occurred when the school children visited the School of Architecture and Design where, in the timber workshop, they constructed models based on their own designs, as well as contributing to the 3D digital models for the Game Lab. This was the beginning of a pathway of learning unfamiliar to many of the children from rural backgrounds; we hope they continue to explore further education as a viable future option, based on this early exposure.

Artists also became involved with science communicators to engage children in a range of other projects. Students at Campbell Town worked with a musician to create soundscapes for an installation called The Hearth, made by Peter E. Davies, at Ross. An Artist-Ecologist workshopped with primary school students to produce sketches of native mammals to be used as playing cards in the Game Lab, while high school students worked on augmented reality for the project with local artists and technology educators. Such collaborations are emblematic of how Island Ark offered a unique platform in educational terms; dovetailing research and teaching, theory and practice, school and industry partners, where students at different stages in their learning (from school children to doctoral researchers) worked together.

Learning from collaborations

The success of collaborations with schools is highly reliant on supportive principals, senior staff and teachers who see the value and take opportunities to engage their students in locally relevant activities, linked with the Australian Curriculum. We found that successful collaborations require more than one-off engagements: building relationships, trust, reputations, and meaningful educational programs takes time. Campbell Town School embraced all of these cross-curriculum opportunities, with great results; on the other hand, several schools declined to be involved, citing the crowded curriculum as a significantly overwhelming issue, affecting their ability to participate. It was apparent that student engagement was more likely where key teachers were enthusiastic and had support, and where leadership recognised the benefits of this educational opportunity.

There were also other challenges faced in the curriculum design; the preparedness of workshop presenters and student 'buy-in'. Through the project we learnt to reduce the number of workshops, keeping them short and connected to a greater outcome, and ensuring they engaged participants by 'doing'. There was an early tendency to plan too many workshops and, despite careful monitoring on the day, timing could be compromised, depending on levels of success with various age groups. Proficiency comes with experience, peer learning and mentoring those who are newly involved. We typically blended experienced workshop leaders with those just starting. We provided new leaders with some preparatory and then moral support on the day. We chose artists who had previous experience and enjoyed working with school children.

We also found it was easier to work with young school children (Years 1-5) and senior students (Years 11-12) who were curious, passionate, and excited about the programs. Working with Year 9-10 children was more challenging: it was difficult to motivate dis-engaged students who did not feel comfortable interacting with tertiary-level students. By working with various school-aged children we tested and adapted the design, length, and number of workshops with each event program.

With the maturing of this place-based educational program, it is now timely to collect more formal evidence on the effects on students. Much of our energy was spent planning, seeking funding, and the fun part of the actual making and doing. Writing this article has led us to question the need to re-test school children to see if their knowledge of threatened Tasmanian mammals has improved. We also plan to investigate two groups of students deeply engaged with the Bushrangers and Species Hotel projects. One is a cohort from Campbell Town (which started in Years 1 and 2) and has been involved for more than four years. This group visited the School of Architecture and Design three times, was comfortable talking to staff and students and was inspired by the environment. The second is students of the School of Architecture and Design. In both instances, surveys will be administered to these students in their current classes; these classes also contain several students who did not participate in the Bushrangers or the Species Hotel projects, and who will act as study controls.

Expanding our community outreach

> *While young people and students are a critical audience, place-based education must be broader than K-12 education. Adults, as well as children, can have deep, transformational relationships with place, while also having an inordinate impact on our world's resources.* (Ardoin 2006, pp. 60-61).

Events that connected with the broader community included an annual 'big night out', where school children and their families and university students were invited to bring headlamps to explore the nocturnal biodiversity of remnant bush on Midland farms, accompanied by scientists with expertise in insects, birds, frog, and bats. Activities like these experienced by farmers when they were young were instrumental in farmers committing themselves to Island Ark project on their farm when older (Bridle et al. 2021, this issue).

Many local people view the town of Ross through the lens of its European heritage, embodied in its historical buildings and streetscapes. Through the presence of the Sculptures, Ross residents have become more aware of the importance of the natural history of the area *beyond* the town borders. Rather than just reading signs describing the riparian restoration plantings, people were invited to actually engage with the Sculptures. These Sculptures convey the need for habitat and the reason for the large plantings along the river. The revision of tourist information maps to include the Species Hotel walk is a further indication of 'investment' in the project by residents of Ross and the wide community.

Our reach has also extended beyond the Midlands through various talks by the champions and researchers, encompassing the science, the arts and/or the place-based education program. These

talks were to community, school and university groups, an arts festival, conference presentations (including a whole symposium dedicated to the Midlands restoration: *Ecological Society of Australia Conference 2019)* and at guided field trips. The field trips to the restoration and research sites (Bailey et al. 2021, this issue), in addition to the Sculptures and the Game Lab, bring these stories to life. These messages and experiences have appeared in traditional, academic and social media (see #specieshotel), leading to increased awareness, visitations, and new collaborators and supporters.

From little things big things grow – funding and challenges

This educational program has responded to 'seeds' of creative ideas. It found champions, such as passionate teachers, scientists, philanthropists, artists and farmers, and then sought funding to support the development of these ideas. There has been an incremental development of activities funded by small pots of money. This was not a linear process, but a web of possibilities developed from the network of connections established; a collaborative network built on trust and inclusiveness. This network engaged with and valued a diversity of perspectives, including those of farmers and members of the Aboriginal community. Engaging a broad range of people to understand and appreciate the area resulted in restoration and conservation efforts being supported and promoted. Most partners dedicated more 'in-kind' effort than we could ever afford, as they valued the opportunities to connect and enjoyed the flow on benefits of contributing locally. Good communication with positive feedback sustained the engagement of these enthusiastic stakeholders. Perhaps the initial lack of a central large fund has, by default, led to more engaged champions and participants; it is a 'built onto' model, rather than a delegation of responsibilities, which may be a more attractive option for participants.

We recognise that this place-based educational program is creating a stronger sense of connectedness with the area that, in turn, leads to a greater sense of awareness, stewardship, and environmental responsibility. It has been an ongoing provision of many high impact learning opportunities that were fun, memorable, and transformational. Most importantly, it is due to the formation of positive relationships that this program continues to inspire. It is driven by passion and excellent communication.

Abridged Acknowledgements

We would like to acknowledge the original owners, the Palawa people, and the use and crossing of the Midlands where we met: Paredareme nation people, Laremairremenar and Poredareme clan groups, Luggermairrerpairrer clan group and the Tyrrernotepanner clan group. We would also like to

acknowledge the current landowners who are supporting the education and restoration programs: the von Bibra, O'Connor, Foster, Bennett, and Young families. In addition, sincere thanks to all the participants and supporters (students, community members, colleagues and in-kind employer contributions and funders) for their contributions.

BOX 1: Indigenous student immersion: two eyed view of conservation – Nel Smit and David Mangenner Gough

Aboriginal immersion is a key part of Island Ark and the Bushrangers project. The deep connection this experience generated over three years acknowledged the ancient close Aboriginal relationship with this Midlands country. It addressed traditional owners' careful management of fire, plants, and animals.

'Two-eyed Seeing' is

> *learning to see from one eye with the strengths of Indigenous knowledge and ways of knowing, and from the other eye with the strengths of Western knowledge and ways of knowing … and learning to use both these eyes together, for the benefit of all* (Bartlett et al. 2012, p. 335).

This approach is used in the Midlands Aboriginal Immersion days (annually, part of National Science Week). Aboriginal leaders and scientists shared their ways of knowing. Aboriginal students were delighted to find stone tools in an Aboriginal stone quarry. They collectively pondered the age of a two-metre stacked eagle's nest, found deep wombat holes, and hugged (remnant) eucalypt trees that were over three hundred years old. These place-based connections provided profound evidence of pre-European habitat.

There were opportunities for these students to be shown effect of fragmentation of native vegetation and loss of native understorey species within the Midlands biodiversity hotspot is manifest in the movement pattern of native animals (Jones and Davidson 2016). Another feature of the site was damage caused by a large bushfire. Students also considered the impact of climate change on this changing landscape.

With this new contextual knowledge, students became active in the future restoration of the Midlands by planting endemic shrubs and trees. These plants were propagated by a local farmer, as well by city students, from locally collected seed. The Aboriginal students from Campbell Town School identified a site in their school grounds in which to grow Aboriginal food plants, to show that

> … [s]*haring our deep-time connections in our cultural heritage sites and our knowledge systems of caring and shaping country has been a very important way for us all to find the best methods to regain a healthier landscape. These include traditional Aboriginal cultural burning and reading the cultural landscapes. Through collaborations with all stakeholders in the regeneration process we can make a positive change to such a heavily impacted landscape* (Gough, pers. comm., 2020)

Box 2 Species Hotel Game Lab – Mike Hornblow

The Game Lab, presented at the Junction Arts Festival, catered for young and mature audiences alike – some drawn to short forays in augmented or virtual reality, others to longer strategic encounters with the Game and posters. An experimental and performative approach suited the festival atmosphere, and encouraged the design team 'Game Masters' to improvise, as conversations with audience-players included stories about landscape degradation and habitat restoration. Large posters illustrated the ecological research, providing reference points as the team moved between design outputs, from augmented or virtual reality, to a lightbox board game, an illuminated bat house, and performances out on the street with local dancers and audience participation. The focal point was the lightbox table, which illuminated a map of the landscape context, including Ross township, the Sculptures site along the Macquarie River, up to the Midlands Highway and across to new stands of native planting, with the ruin of an old shearing shed nearby.

The lightbox map provided the central play terrain for a strategy board game using cards, dice, icons, and props found on the Midlands site. Players adopted an animal avatar to compete against, or collaborate with, one another, based on what each species needs to survive and reproduce. Choosing habitat conditions conducive for their avatar – foraging, nesting, breeding, refuge – they avoided predators or pursued prey, while adapting to broader climatic events and human interventions. Each player held three sets of playing cards – animal, landscape, and event – used to affect change as they established their place in a shifting environment. Landscape cards included a broad range of elements – woodland remnants, new plantings, hollow logs, and so on. Event cards included anything from weed invasions, urban sprawl and angry farmers, to bushfire, flood and drought. Animal cards included native fauna common to the area, even the extinct *Thylacine* (Tasmanian Tiger), as well as introduced predators, such as feral cats. The game took on a life of its own when players joined in the process of inventing stories and rules in response to changing conditions; design elements created by local school children served as placeholders for community participation.

Box 3 Implications for future project managers

- Start small and build up slowly, as this allows for important trust to form between partners (such as not-for-profit organisations, schools, the university and local community).
- It is preferable to have a number of key champions/projects identified early in the process, as circumstances change, over time.
- The Australian primary and secondary school curricula are crowded, so there is need to work and fit with enthusiastic school leader(s) and the teachers to encourage them to be directly involved, or *vice versa*.
- It is easier to work with passionate and curious school children: Years 1- 5 or committed Year 11-12 students undertaking geography or biology.

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Figures Legend

Figure 1. School children, university students and researchers making observations of animals and their use of the Species Hotel Sculpture. Image credit: Nel Smit.

Figure 2. The main components of the place-based educational program (solid coloured boxes), embedded activities (dotted boxes), funders (in bold italics), associated projects (normal text) and, participants (green text) with connections indicated by arrows and inclusion in the circle.

Figure 3. The images of African (top row) and Tasmanian (bottom row) animals shown to school students in an engagement survey for the Bushrangers project. Of the 180 students surveyed, all correctly identified the African animals (Zebra, Elephant, Giraffe, Rhinoceros), but very few of the Tasmanian animals (Eastern barred Bandicoot, Eastern Bettong, Tasmanian Devil, Spotted-tailed Quoll).

Figure 4. The range of activities undertaken by school children through the Bushrangers include: (a) planting native trees on Midlands farms; (b) doctoral researchers introducing school children to their work to monitor Midlands fauna; (c) high school students using an interactive map to better understand human and natural history of the Midlands. Image credits: Nel Smit.

Figure 5. Science Week Aboriginal Immersion day (a) and a community field day; (b) with Aboriginal elders on Country (near Ross) to raise awareness of local Tyerrernotepanner people's heritage and identity. Image credits: (a) Nel Smit; (b) Louise Wallis.

Figure 6. The second generation of Species Hotel Sculptures being installed by first year university students. Image credit: Louise Wallis

Figure 7. Playing the light table board game with public participants at the Species Hotel Game Lab, Junction Arts Festival. Image credit: Mike Hornblow.