Communicating as Community: Examining Power and Authority in Community-focused Environmental Communication through Participatory Action Research in the Ourimbah Creek Valley

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Abstract

In this paper we argue that the making of meaning is a powerful creative act that occurs within social and cultural contexts where there exists a multi-directional flow or interconnected relationships within a system of communication (McIntyre, 2012). This little explored set of ideas echoes Rogers and Kincaid's earlier systems-based proposition that "the communication process has no beginning and no end, only the mutually defining relationship among the parts which give meaning to the whole" (1981, pp. 55-56). Similarly, Ali et al. have suggested that the "holistic, relational, interactional, and process-nature of Indigenous ontologies and epistemologies resemble the tenets of systems theory" (2022). With this theoretical foundation in place – located in complex and interconnected systems rather than a Western reductionist worldview (Gadgil et al, 1993) – this project uses action research as a methodology, reframing participants from 'subjects' to co-researchers. We assert that "people's right and ability to have a say in decisions which affect them and claim to generate knowledge about them" (Reason and Bradbury, 2011, p. 9) can empower them on multiple levels to enact change (Freire, 1970; Reason, 2005; Reason and Bradbury, 2011). From this position, "we acknowledge our lives are in connection with multitudes of other beings" (Weir, 2012, p. 4) and that many of the key concepts of this project are rooted in Indigenous knowledges. As such, traditional notions of top-down power are challenged in favour of an even and diffuse power distribution within a communication act (Foucault, 1980).

The specific act of communication under examination is found in the Department of Planning, Industry and Environment (DPIE) and various communications to the public concerning the necessity of preserving threatened species. The DPIE's perception of a lack of public awareness led to the planning and execution of a pilot programme to engage public understanding and acceptance of the issues faced (PRIA, 2011). The project team, including DPIE and Darkinjung Local Aboriginal Land Council, set out to create a participatory community of inquiry in the Ourimbah Creek Valley, located on the Central Coast of New South Wales. This valley is home to 48 threatened fauna species and at least 12 threatened flora species and is critical to their survival. To engage with this action-research approach, residents were invited to a workshop which included a site visit, a bush-food inspired morning tea, and a collaborative art-making activity to share knowledge and build community awareness of and encourage stewardship of two threatened species. This paper reports on the findings of this action-research process.

Keywords

Environmental Communication, Threatened Species, Systems Thinking, Diffusion of Innovation, Everett Rogers, Action Research.

Introduction

It is no secret that Australia's biodiversity is in rapid decline. Since European invasion, 34 native mammal species have been driven to extinction, with over 1900 threatened species and ecological communities facing similar futures (Ritchie et al, 2021). In the past few years alone, we have seen mass casualties. The World Wildlife Fund estimates that almost three billion mammals, birds, reptiles and frogs were killed in the recent 2019-2020 Australian bushfires (WWF, 2021).

In NSW, almost 1000 animal and plant species are at risk, with decreasing population sizes, restricted geographical distributions, and limited mature individuals. In the Hunter and Central Coast regions, many of these species can be found in neighbourhood streets and backyards, leading many to not realise they are threatened. This perceived lack of public awareness is of vital importance to our industry partner in this research, the NSW Government's Saving our Species (SoS) program. This program acknowledges the difficulty of communicating to the public the necessity of preserving threatened species. Luke Foster, Senior Threatened Species officer for SoS, explained: "I consistently encounter the same problems: one, most threats could be removed or downgraded if the public were better educated, and two, the community education we do do, isn't reaching the people who can make a difference at a site level" (personal communication, October 28, 2020).

The Saving our Species program within the Department of Planning, Industry and Environment (DPIE) was established as a flagship threatened-species conservation program that includes scientists, businesses, community groups and the NSW Government working together to secure the future of Australia's plants and animals. The objectives of Saving our Species are twofold: "to increase the number of threatened species that are secure in the wild in New South Wales for 100 years and control the key threats facing our threatened plants and animals" (SoS, 2021). As such, researchers from The University of Newcastle (UoN), in conjunction with SoS, the Darkinjung Local Aboriginal Land Council, and two internationally exhibited artists, set out to plan and execute a pilot programme to facilitate public understanding and acceptance of the issues faced (PRIA, 2011).

The site of this project is the Ourimbah Creek Valley located on Darkinjung Country at *Norimbah* (Ourimbah) on the Central Coast of NSW. Traditionally, *Norimbah* means "place of the sacred circle or Bora ceremony where Aboriginal people went through their ritual of Lore", with local clan groups participating in these ceremonies over many generations (K. Duncan, personal communication, February 2, 2021). Following colonisation, the Ourimbah Creek Valley is a meandering area of remnant rainforest patches, fertile river flats, National Parkland, and approximately 100 private homes and farms. It is also home to at least 48 threatened fauna species and 12 threatened flora species. While all species are important, two are under the remit of SoS: *Syzygium paniculatum* (Magenta Lilly Pilly) and *Prostanthera askania* (Tranquility Mintbush). Both species belong to larger genera which have general names on Darkinjung Country: Mudjuburi and Girang respectively. The Ourimbah Creek Valley is critical for the survival of both species as it represents the westernmost occurrence of Magenta Lilly Pilly, which is crucial for understanding its adaptive capacity in a changing climate, and it contains one of the largest known monitored populations of the Tranquility Mintbush.

Since European invasion, extensive populations of both *Syzygium paniculatum* and *Prostanthera askania* have been significantly reduced, with several populations entirely eliminated (DEC, 2006; DECC, 2007). For *S. paniculatum*, current estimates suggest around 1200 wild individuals across five disjunct metapopulations (OEH, 2012). However, the number of individuals may be significantly reduced due to the discovery of hybridisation, with a more common *Syzygium* species in the north of the species range (Foster and Mulcahy, 2019). Genetic work is currently underway to determine the true number of individuals and metapopulations (L. Foster, personal communication, June 25, 2021). For *P. askania*,

which is only found in a restricted range of 12km² on the Central Coast of NSW (except for a small outlier population in Bouddi National Park), the site at Ourimbah has been documented to cover approximately 300m² which is 70% larger than other *P. askania* populations across the SoS management sites (Focus Flora Surveys, 2017-21). As Ransom notes, "with limited funding to secure land for conservation, the value of sensitively managed private property cannot be understated" (personal communication, June 26, 2021). Threats to both species include low genetic diversity, inappropriate fire regimes, weed invasion, habitat loss through land clearing and urban development (Conn 1997), grazing and trampling, rubbish dumping, and climate change (DEC, 2006; DECC, 2007). It is clear that most of these threats are human-induced, and so involving the community is paramount to minimising them.

With these key issues identified by our industry partners, this project sought to engage community members in the Ourimbah Creek Valley in a tailored workshop to share knowledge, strengthen community connections, and engage in storytelling to communicate data around threatened species. These strategies, as a form of effective science communication, are designed to publicise and protect threatened species, build knowledge of local biodiversity, and encourage positive community change.

Background

Since this project is, at heart, a form of science communication sitting within the broader realm of all human communication, we can say that there are two fundamental schools of thought employed in this area: the process school and the cultural context school (McIntyre, 2010, p. 1). The process school conceptualises communication "as the efficient transmission of intentional 'messages' from senders to receivers" (Schroder et al, 2003, p. 27). Most science communication has traditionally followed this model (see Nisbet and Scheufele, 2009). Conversely, the cultural context school focuses on how meaning is produced, negotiated, and processed by audiences within specific cultural contexts (Schirato and Yell, 2000, p.1).

One of the latter school's founding figures, Raymond Williams, acknowledged the significance of creativity in the act of communication. He argued that any analysis of communication and culture must start, "from an examination of the nature of creative activity" (Williams, 1961, p. xiii). With this in mind, we can say that the making of meaning is a creative act that occurs within social and cultural contexts where there is a multi-directional flow or interconnected relationship between multiple components of a system of communication (McIntyre, 2010, 2012). This little explored set of ideas from the research literature echoes Rogers and Kincaid's earlier proposition that "the communication process has no beginning and no end, only the mutually defining relationship among the parts which give meaning to the whole" (1981, pp. 55-56).

This project utilises a modification of the Diffusion of Innovation model originally developed by Everett Rogers (1962/2003), which has been applied, experimented with and continually updated across time in a number of settings (e.g. Balas and Chapman, 2018; Centola, 2015; Centola, 2021; Dearing, 2009; Lundblad, 2003; MacVaugh and Schiavone, 2010; Mascia and Mills, 2018; Tonts, Yarwood & Jones, 2010; Wani and Ali, 2015) including within the discipline of Communication (e.g. Barker, 2004). Roger's Diffusion of Innovation model sets out the process of communicating new ideas through a social system over time. Moving away from linear understandings of communication, the concept acknowledges that any diffusion "event is only one part of a total process in which information is exchanged" (Rogers, 1962/2003, p. 6) and thus lends itself to examining a systems approach to environmental communication, as well as reflecting a central tenet of Indigenous knowledge systems (Ali et al, 2022, n.p.). Rogers notes that this systemic process of information exchange encompasses "both the planned and the spontaneous spread of new ideas" which causes an alteration "in the structure and function of a social system" (1962/2003, p. 6). Thus, as the innovation spreads, social change occurs.

According to Rogers there are four main elements identifiable in every diffusion program: the innovation, communication channels, time, and the social system (1962/2003, p. 11). It is important to note that each of these elements are not, in terms of their real-world existence, separate from one another. In fact, it is the opposite; each of these components is intricately connected to each other so much so that they constitute one another.

Innovation for this project is for the community and its members to recognise that they are living inside systems. They are not separate beings, but rather intimately connected to the ecosystem they exist in and the broader biodiversity around them (Berkes and Folke, 1998; Folke et al, 2016, p. 39). As Massey asserts "social systems are linked to ecological-biological systems" (2017, p. 327), an idea reinforced by Foxwell-Norton who insists that "humans and nature are interconnected via systems" (2019, p. 30). These statements echo the First Nations concept of Country, which is a more complex and dynamic notion than "a people-place match" (Weir, 2012, p. 2). It is multilayered, unique to every individual, and encompasses a multiplicity of forms and meanings (Sutton, 1995, pp. 49–50). As Muller explains, "for many Indigenous systems, knowledge is constructed through understanding connections of species to each other, to people, ancestors, stories, dances, art, science, politics, economics, power, society and the cosmos" (2012, p. 59). And according to Weir, "Country is the locus of this knowledge and ecological life" (2012, p. 3). As humans, we exist within social, cultural, creative, and innovative systems, as well as communication systems which are intertwined with ecological systems. Considering the interdependent relationships between multiple components of a large system means acknowledging that changes in one area will inevitably affect another. The entry point to this way of thinking for this project was the two threatened species, *Syzygium paniculatum* (Magenta Lilly Pilly) and *Prostanthera askania* (Tranquility Mintbush).

Rogers identified five characteristics that contribute to whether an innovation is readily adopted or not: relative advantage, compatibility, complexity, trialability, and observability. The relative advantage of our innovation, as perceived by individuals, is that through a deeper understanding of the relationship between humans and the ecological system they are part of, the more likely they are to protect it. As Rogers explains, the clearer this message is, "the more rapid its rate of adoption will be" (1962/2003, p. 15). Compatibility refers to how closely the innovation appears to align with the existing values, needs and the prior experiences of potential adopters. If an innovation is perceived as being consistent with an established value system, it is more likely to be adopted. While not every innovation is necessarily desirable or appropriate for all members of the social system, and certainly within the group of participants some were more overtly engaged than others, there was no evidence of disagreement during the workshop (Rogers, 1962/2003, p. 12). Similarly, with regard to complexity, the less complicated and easier to understand the innovation is, the more likely it is to be adopted (Rogers, 1962/2003, p. 16). Rogers notes that the trialability of an innovation – that is the possibility for it to be engaged with on a trial basis – also impacts how quickly it is adopted. If people can experiment and test the innovation, this allows for the possibility to learn through engagement and reduce uncertainty around the benefit, compatibility, and complexity issues one might have as well. Finally, observability is a significant factor as when individuals can clearly see the results of an innovation in practice within their own network it is more likely that they will adapt it for themselves. Rogers notes that while all five of these are significant factors in explaining the rate of adoption, the first two – relative advantage and compatibility, "are particularly important" (1962/2003, p. 17). It is also worthwhile to note that innovations change as they are diffused, and when an innovation is reinvented it "diffuses more rapidly" and "its adoption is more likely to be sustained" (Rogers, 1962/2003, p. 17).

This project tested these ideas through an action-research approach, looking at the Ourimbah Creek Valley and the threatened species that co-exist with the communities that populate the valley.

Methodology

The interdisciplinary and inter-organisational research team aimed to create participative communities of inquiry by "engaging those who might otherwise be subjects of research or recipients of interventions to a greater or less extent as inquiring co-researchers" (Reason and Bradbury, 2011, p. 1). With this foundation in place, this project employed an action-research methodology.

While action research is largely a qualitative methodology, it is not uncommon to utilise mixed methods to move beyond conventional divides of objectivity and subjectivity to focus on actions that occur in the world (Greenwood and Levin 2001). By beginning with an examination of everyday experience, action research and its focus on living knowledge evolves and develops over time. This reflects First Nations knowledge systems, which note that knowledge is not static, but rather fluid, dynamic, and changeable by nature (Briggs, 2005; Christie, 2007; Sillitoe, 1998). Taking this approach has the potential to create positive change on both small and large scales as "individuals develop skills of inquiry and communities of inquiry develop within communities of practice" (Reason and Bradbury, 2011, p. 5).

Reframing participants from subjects to coresearchers is also a radical act as "asserting people's right and ability to have a say in decisions which affect them and claim to generate knowledge about them" (Reason and Bradbury, 2011, p. 9) can empower both Indigenous and non-Indigenous people on multiple levels to expand capability in constructing and using knowledge (Freire, 1970; Reason, 2005). In doing this, the relationship between humans and ecology can be foregrounded for active decision making in "a move towards more holistic or integrated thinking" (Weir 2012, p. 4). Additionally, this approach centres a flat network of power relationships where no one person is elevated above others. Therefore, action research is the most appropriate methodology for this research to engage both industry partners and community members in a participatory experience that will result in mutually beneficial change.

Drawing on many different models of action research – including Ebbutt, 1985; Elliott, 1991; Kemmis and McTaggart, 1988; Lewin, 1946; McNiff, 1988; Whitehead and McNiff, 2006 – this project design was articulated using the pathway of planning, action, analysis, and conclusion. During the planning phase, the research focus was defined, a literature review undertaken, and data collection methods were designed. As part of the ethics application, a timeline was set, and permissions were sought. A research team member from SoS identified the Ourimbah Creek Valley site as particularly challenging to manage due to the number of and diversity of landholders in the area. However, this defined community also provided a unique opportunity as "it is a contained valley with a relatively clear target audience" (L. Foster, personal communication, September 17, 2020). Additionally, the SoS team had already begun establishing preliminary relationships with key stakeholders including Hidden Valley, a co-operatively owned Horse-Riding property. Foster also suggested an educational element involving food as he felt certain that most residents may be unaware of the two species growing both in the valley and on their own properties (personal communication, September 17, 2020). The key goal of the workshop was to encourage community stewardship of the species.

The action phase of action research is not a single moment in time, but rather it involves multiple cycles of experimentation and data collection in conjunction with an ongoing process of reflection. This project engaged qualitative methods of observations, interviews, and participant made artifacts, and compared these with quantitative data gathered from existing sources. The community-focused workshop included a site visit to engage with, and explore, the flora in its natural habitat. Participants were welcomed to country with a smoking ceremony by Darkinjung elder, Kevin 'Gavi' Duncan, and two SoS team members facilitated a guided discussion about the threatened species. Following a morning tea featuring Native Australian bush foods, the participants were invited to participate in a communal art-making activity to create small sculptural components from clay and found materials. Observation and informal interviews occurred throughout the workshop and data was collected in research journals, enabling reflection on the effectiveness of the project's storytelling approach. Analysis of this collected data occurred as themes were identified and results discussed with the research team and key stakeholders.

Social System – Agents of Change

The workshop participants consisted of eight members of the co-operatively owned Hidden Valley Farm, six Ourimbah Creek Road residents, and two participants who lived elsewhere but had some relationship to others in the group. There was a mix of long-term residents, recent relocations from Sydney, and some weekend visitors who had been doing so for years. The average tenure of Hidden Valley members was around five years, with some having held a membership for more than twenty. While there was some variation in terms of socioeconomic status, most of the participants appeared to be from the professional class, although there were some tradespeople and those with larger blocks of land tended to be hobby farmers. There was a sense of family focus, with several participants speaking about their children during the workshop, lots of long-term partners, and one woman attending with her daughter's friend. As the participants began arriving in the morning, some met each other for the first time with polite handshakes while others greeted old friends with full-bodied hugs. The energy of the group shifted and changed with each arrival, with only one moment where an arrival appeared to ripple through the group resulting in a momentarily dampening effect. The group regained its equilibrium quickly and moved on, thus demonstrating that the constantly evolving nature of the social system.

Although SoS had previously established several relationships with members of the Ourimbah Creek community, the people who engaged with this project were largely unknown. The research team knew, based on Rogers' Diffusion of Innovation model, that opinion leaders would be useful to the project as they "provide information and advice about innovations to many other individuals in the system" (Rogers, 1962/2003, p. 26). One such opinion leader was quickly identified as a key agent of change who could activate the local network to facilitate the spread of information. As the Chair of the Hidden Valley Board of Directors, she was immediately interested in working in collaboration with the research team to facilitate a workshop on their property for both members and residents. As Rogers notes "the most striking characteristic of opinion leaders is their unique and influential position in their system's communication structure; they are at the center of interpersonal communication networks" (1962/2003, p. 27). This became clear as the Hidden Valley Chair was not only a central figure within that private community, but she also held a reasonable amount of social capital among the Ourimbah Creek residents and was part of a group of environmentally conscious locals.

Opinion leaders are likely to be broadly homophilous with the social network. Their leadership may be formal or informal, but it is generally maintained through their level of competence, social accessibility, and adherence to social norms. The Chair's respected position within both networks was pivotal to inviting participants to the workshop as she was able to leverage her existing modes of communication to share information and encourage participation. Her posts on both the Hidden Valley members Facebook page and private Ourimbah Creek residents page were responsible for the majority of respondents. In this way, her interpersonal networks allowed her to serve as a social model whose positive response to the innovative opportunity was then mirrored by other members of the system. As Rogers explains, "opinion leaders thus exemplify and express the system's structure" (1962/2003, p. 27).

While this agent of change was ultimately unable to attend the workshop, she advised us that two good friends would attend in her stead. She noted "they are very passionate about our native flora and fauna and will be more than equal to the task...possibly more passionate than me" (personal communication, April 30, 2021). As the workshop unfolded it became clear that these two were opinion leaders/agents of change in their own right. They had a tangible connection to the place where the workshop was held, exuded a gentle sense of authority, and actively participated in the workshop activities. As opinion leaders, and therefore central to the communication network, they served as "a social model whose innovative behavior [was] imitated by many other members of the system" (Rogers, 1962/2003, p. 27). They even brought their two dogs to the event which had an icebreaker effect on the group. At one point, while walking back from the smoking ceremony, the dogs were allowed off their leashes. They raced along the dirt road and in and out of horse paddocks romping with one another. This action

demonstrated several things. Firstly, that they were allowed to do so indicated the owners' social status in the community. Secondly, it spoke to a sense of ownership as this occurred on both public and private land. And finally, it represented a norm in terms of the established behavioural patterns of the members of this unique social system.

While it could be argued that every participant on the day was an agent of change with varying degrees of influence, the research team was interested in identifying those with a reasonable amount of social capital. While agents of change often possess a greater degree of knowledge or skills than other members of the community network, it is equally problematic if everyone is at the same level as there is no new information to exchange. Throughout the workshop, the status of certain members shifted and transformed. Several times, community members demonstrated their considerable knowledge not just about the two threatened species, but about environmental and biodiversity issues in general. For instance, during the talk about *P. askania*, the SoS team member acknowledged and invited two participants to share their knowledge of the species with the group. There was a distinct sense of ownership from these participants as their land is the site of a large known population of *P. askania* on private property, representing approximately 10% of all known plants (A. Mulcahy personal communication, June 28, 2021). At other times, residents indicated that they would like more knowledge, particularly regarding invasive weed management on their property, noting specifically that they wanted to work in a cooperative manner. As such, the Ourimbah Creek social system were engaged in joint problem solving and through the "sharing of a common objective" (Rogers, 1962/2003, p. 24) the system bound itself together.

Findings and Analysis

The ultimate aim for this project is to diffuse a particular innovative idea through a community and for community members to consider themselves connected to, rather than separated from, the ecological system around them (Berkes and Folke, 1998; Weir, 2008). This ideological separation is hard to let go of as it is often the basis of western knowledge constructions around the relationship between humans, nature, and culture (Briggs, 2005; Christie, 1990; Sarewitz, 2004; Weir, 2008). Rogers' Diffusion of Innovation model provided the research team with a systematic procedure through which to explore how this occurred.

Turning off the Pacific Highway, circling under the Highway overpass and onto Ourimbah Creek Road which runs along the creek line, there is a distinct feeling of crossing the threshold into a different place. Along the road there are a low double brick houses with freshly mowed lawns and flag poles flying the Australian flag amid well-pruned rose gardens. As the road winds on, the vegetation becomes denser and a large Queenslander appears, while weatherboard houses with verandas and small hobby farms begin to materialise. Punctuating the string of long driveways is a collection of unique letterboxes: a monolithic modernist steel box, a traditional Australia Post public post box, cut up water containers, termite infested wooden boxes, and bespoke rusted metal faces laughing maniacally as they swallow the mail. Deeper into the valley the air cools and rainforest remnants appear. Sheep, cattle, alpacas, pigs and horses can be seen scattered through paddocks, with the occasional animal wandering cheekily alongside the road. *S. paniculatum* is observable in several locations along the road and the further up the valley the less European the trees become. As the houses begin to thin and properties grow larger, a sign for Hidden Valley marks one of the largest landholders in the area; a co-operatively owned horse-riding farm with thirty member families.

When the project began, members of the research team made several site visits and spoke with residents and community members who were initially wary of outsiders. Following formal introductions, the researchers explained their objectives and desire to learn from and with the community rather than impose external values. Community members visibly relaxed and began sharing information about their

experiences living in the Ourimbah Creek Valley, including their interests in flora and fauna; their knowledge of, and contribution to, the conservation of threatened species, suggestions for who else to speak with, and occasionally an invitation to join them on a walk of local properties. The initial distrust of the outsider, which was to be expected, dissipated upon finding common ground and feeling reassured that the exchange was not an attempt to force or impose anything from an institutional level.

The fact that the research team members on these site visits were from two well established institutions (UoN and the DPIE) presented an interesting dynamic in these interactions. While credentials from these organisations carry a reasonable amount of cultural capital, they also distance the researchers, identifying them as social strangers within the Ourimbah Creek community. Additionally, within both organisations there is a well-developed social structure consisting of hierarchical positions and there is a general assumption that these patterned social relationships can play out in other arenas. As such, the researchers worked to establish a heterophilous foundation whereby similarities with the community members were highlighted and mirrored back to them.

The Mother Tree

On a reconnaissance visit prior to the workshop, the team from SoS and the Senior Research Officer (SRO) were scouting the walk that participants would be taken on. Starting from the Hidden Valley barn, they walked across the road and peered through the trees to the creek. Almost immediately a *S. paniculatum* was located and verified as having been previously unrecorded by DPIE. A brief explanation of how to identify the species was given to the SRO and the walk continued with two more trees observed in a similar manner. The team was looking for a specific mature tree that had been written about pre-GPS tagging and not been located since (Payne, 1991). When the team arrived at a back paddock, the sought-after tree was located with a trunk easily one and a half meters in diameter, laden with flower buds. It is important to note that while locating this tree was significant for this project, as it would be the place participants would be taken to, the research team acknowledges that they did not 'discover' it. This impressive tree, along with many others, has been in existence for hundreds of years and would easily pre-date European occupation of Australia.

For the community workshop, Darkinjung Elder Gavi Duncan performed a Welcome to Country and Smoking Ceremony at this site. While the research team knew this was an important part of the workshop, the profound effect it had on the participants was a surprise. The group watched respectfully as the smoke began to plume and after another Darkinjung team member made the first move through the smoke, everyone followed suit. Participants were observed taking a moment to breathe in and mindfully connect with the tree and the Indigenous knowledge that had been shared with them. It was a reminder that it was not simply the research team, the community members, and the tree that were present that day, but also thousands of years of Indigenous occupation. This acknowledgement of the connection between the knowledge traditions of Country and ecology illustrated the interdependence of the two concepts (Weir, 2012, p. 5) and the importance of understanding 'two ways' of knowledge construction (Muller, 2012, p. 69).

It was also interesting to observe how people's engagement with the Mother Tree changed throughout the workshop as the various ways of seeing it were revealed – from an unidentified tree only known for providing summertime shade for horse to a threatened species on private property; to understanding the age and significance of its size, talking through its history and potential uses, and being invited to engage with the tree through the smoking ceremony. Contemplating these various stories allowed participants to reflect on their own engagement with nature and to consider their connection to it. To understand that something in their very own backyard could be so significant was profound for several members. Some were visibly moved by this experience – sitting down, eyes closed in quiet contemplation. Two different women later remarked that they were affected to the point of tears. This prompted some thinking about whether the tree was an agent of change herself and what part she played

in this socio-bio-ecological system. As Christie explains, "knowledge is not limited to human agency, with the land and other species revealing and keeping knowledge alive" (Muller, 2012, p. 59).

Contemplating connection to the socio-bio-ecological system that humans are a part of is vital to our continued survival. While Rogers notes that "an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption", in this case, the innovative idea, at least to a Western point of view, is that community members are an intricate part of a much larger system in operation (1962/2003, p. 12). They are not separate from nature, but intimately connected to the broader ecosystem. This sits well with "the views of Indigenous ontologies and epistemologies which build on holistic, relational and temporal worldviews by linking people, earth and life on earth as interconnected parts of a complex greater web of life which functions on the principle of balance in the system" (Ali et al., 2022, n.p.). As Weir explains, "knowledge, country, species and people are co-created" (2012, p. 3). And while this is not "'objectively' new as measured by the lapse of time since its first use or discovery", the way this material was presented through multiple modes of storytelling throughout the workshop was acknowledged by participants as being effective (ibid). According to Rogers, "newness in an innovation need not just involve new knowledge" so simply changing the approach through which this knowledge was shared was an innovative practice (1962/2003, p. 12).

Following a brief information session where two SoS team members shared how to identify these two species, where they may be found and how they can be propagated, questions arose regarding the utility of the two plants for humans. This was interesting and goes to the heart of the complexity of environmental communication. Western perspectives often conceptualise nature as a material resource to be benefited from, and the research team had anticipated this when selecting the two threatened species (Braun 2002, p. 41; Robin 2007, p. 186). *S. paniculatum*, as with other types of Lilly Pilly, has a strong Aboriginal cultural connection as a food and medicinal resource. Early journal entries by Captain Cook and Joseph Banks note members of the Gweagal clan of the Dharawal people eating fruit presumably from *S. paniculatum* (Benson and Eldershaw, 2007, p. 116). It is possible that the majestic Magenta Lilly Pilly trees still present in Botany Bay are the very same ones observed by Cook and Banks and used for generations by the Gweagal clan. However, documentation on the cultural and European historical uses for *P. askania*, the Tranquility Mintbush, have been difficult to obtain. Other species of Mintbush are known to be edible and used by First Nations people for medicinal purposes to soothe digestive complaints among other things. It is likely that the *P. askania* with its strong aroma was similarly utilised. Sharing this information while in the field allowed for a more complete contextual understanding of the tree by everyone involved which in turn has the potential to create more dynamic change.

While humans have been conditioned to consider the value of the external world primarily in relation to themselves, for this project and indeed for biodiversity conservation and environmental communication overall, understanding the interrelated nature of our relationship as humans with the broader ecological environment is necessary. Each plant and animal contribute to a healthy natural environment. Every loss has an impact on our ecosystem which affects air and water quality, pollination, pest control and even the economy (Losey and Vaughan, 2006). Understanding our place in connection to all life is a fundamental necessity for the preservation of our planet's future. According to Rogers, "a technological innovation usually has at least some degree of benefit for its potential adopters, but this advantage is not always clear cut to those intended adopters" (1962/2003, p. 14). However, when the advantage is clear the innovation is more readily adopted as the individual is more likely to "exert effort to learn more about the innovation" (ibid). Therefore, educating people about the uses and utility of these plants is valuable in articulating the advantage of preserving them, not only as a source of food for humans and animals, but as a shade tree for wildlife, a canopy tree in a littoral rainforest, and a key species within an ecological network. Shifting ourselves out of this humancentric, Ptolemaic understanding of the world in favour of a Copernican view which acknowledges "the person is part of a system of mutual

influences" we are re-situating humanity within nature and acknowledging our connection with one another (Csikszentmihalyi, 1988, p. 366; Weir, 2012).

Communication Channels

Along Ourimbah Creek Road, mobile phone reception diminishes until it is eventually gone altogether. One workshop participant noted that during the last major round of bushfires in the area, the fire brigade had to bring in a satellite dish to maintain connection to the outside world. While some residents have broadband access it is limited and Hidden Valley have in fact decided not to activate it at all. They have a landline instead. Several workshop participants noted that this disconnection from the internet and related devices is part of the reason they visit every weekend. They want to connect with one another and nature without technological interruption, and they want their children to experience that as well.

With any communication act a message is exchanged between multiple parties. The diffusion of our message content occurred through multiple channels in a complex communication network. The research team engaged with traditional mass media channels such as radio and newspaper press, a targeted approach which included email, Facebook posts, traditional post (via a letter drop), and face-to-face communication. Understanding this complex communication network is important as "the behaviour of an individual is partly a function of the communication networks in which the individual is a member" (Rogers, 1981, p. 90).

It was important to the project to share information widely in the lead up to the workshop. According to Rogers, "mass media channels are usually the most rapid and efficient means of informing an audience of potential adopters about the existence of an innovation – that is, to create awareness-knowledge" (1962/2003, p. 18). The SRO gave interviews with ABC Newcastle and 2NUR radio as well as Central Coast Newspapers who, in addition to their online readership, have a total print run of 170,000 papers every month (CCN, 2021). However, the research team knew that because the workshop was only for residents and members of the Ourimbah Creek community, a more targeted approach was necessary.

The geographically narrow connection along one main road with approximately one hundred private landholders meant that a letterbox drop would be a simple and effective way of communicating to the community. Two members of the research team (one UoN, one SoS), hand delivered packets containing information and consent forms along with an invitation to the workshop. Throughout the morning, they stopped to introduce themselves to residents who were curious about their presence in the valley. Several residents expressed surprise that "members of the government" were engaged in this kind of community facing work (fieldnotes April 16, 2021). This, and several conversations with workshop participants, reflected a sense of disconnection between governing bodies and the people they serve, as well as a general disappointment that bridging this divide has become increasingly difficult (fieldnotes April 16, 2021).

It became clear through these interactions that interpersonal channels involving face-to-face exchanges would be effective within the community. As Rogers explains, "interpersonal channels are more effective in persuading an individual to accept a new idea, especially if the interpersonal channel links two or more individuals who are similar in socioeconomic status education, or other important ways" (1962/2003, p. 18). Through the research team's interpersonal exchanges with residents and community members, opportunities to highlight the similarities between the research team and the community were identified, along with points of resistance that could be overcome. Sharing and amplifying our homophilous nature was important to the diffusion process as "when homophily is present, communication is therefore likely to be rewarding to both participants" (Rogers, 1962/2003, p. 19). When asked why participants had decided to attend the workshop, several articulated that it was due to the inclusive nature and "village feel" they had garnered from the invitation and general approach (fieldnotes May 1, 2021). These same individuals also noted the gentle pace of the workshop's timing (fieldnotes May 1, 2021).

Finally, as Rogers noted "interactive communication via the Internet" has become an increasingly significant channel in complex communication networks (1962/2003, p. 18). Speaking with numerous agents of change within the Ourimbah Creek community, it became clear that a key form of interactive communication was Facebook. Hidden Valley communicated to its members via its Facebook page, but it was eventually revealed to the research team that there was a private and often used Ourimbah Creek residents Facebook page. Posts by the Hidden Valley Chairperson were shared on both pages and provided gentle encouragement to participate in the workshop as a place where people could ask questions and receive answers from their trusted community network. This modelling by early adopters of the diffusion process works to encourage imitation by potential adopters demonstrating that "diffusion is a very social process that involves interpersonal communication relationships" (Rogers, 1962/2003, p. 19).

Time

This project took place over six months. However, members of the SoS team have been working with the community on threatened species in the area since 2017. Whenever representatives from the research team (largely the SRO and the SoS team members) were able to speak to someone directly – primarily face-to-face, phone or occasionally email – the speed with which they shifted from natural hesitation regarding a new idea to acceptance and often excitement about participating in the project was surprising. Rogers refers to this as the innovation-decision process where "an individual (or other decision-making unit) passes from first knowledge of an innovation to the formation of an attitude toward the innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision" (1962/2003, p. 20).

With many of the participants, this participation happened quickly. Learning about the potential of having threatened species on the property was their first introduction to the innovative idea. Walking and talking together as a group, meeting at the Mother Tree for a Welcome to Country and Smoking Ceremony, and learning about the significance and value of the two threatened species resulted in a tangible shift for some. Those who had been observing from the periphery began to talk with other participants and connect with members of the research team. Those who were already quite open began sharing information with one another. At one point, a research team member was passing around *S. paniculatum* seeds and explaining their multi-embryonic structure, when it became apparent that several participants were already familiar with planting these seeds and had been doing so for some time. They began to share tips and suggestions with one another. Several participants collected fallen seeds to take home to plant in their own gardens. Many of these same people also took authorised cuttings of *P. askania* that were provided for educational and art-making purposes, asking questions about correct cultivation practices. It was clear that they had been engaged in the innovation-decision process whereby they were introduced to new knowledge. They were persuaded by the project's storytelling mechanisms, deciding to adopt these ideas and move into implementation and confirmation stages by taking seeds and cuttings home. Additionally, several participants noted that they felt confident to survey their own properties to see whether they could identify these two species.

That is not to say however, that there was a complete diffusion of innovation within the 3-hour workshop. Rather, participants were presented with the key idea to encourage them to think about themselves in relation to the broader ecological environment they are part of. Long term change within the community will require more time and effort. While some people may have been convinced after one workshop, this reorienting of understanding one's place in the world is an ongoing process. The research team is continuing to work with the Ourimbah Creek residents and community to build this understanding of social-bio-ecological connection.

Conclusion

David Attenborough recently stated, "saving our planet is now a communications challenge" (BBC, 2020). As such, a project focused on environmental communication speaks to the very heart of our planet's number one concern. This project set out to engage a specific community group in a workshop about two threatened species. This workshop was the point of entry for the research team to diffuse innovative ideas and encourage the community to begin thinking about themselves in a systemic relationship to their surrounding ecosystem. This innovation was spread through multiple channels in a complex communication network which consisted of mass media, social media, a letterbox drop, and personalised interactions. Key agents of change were identified as being fundamental to the process of diffusion, and around a third of the participants took *S. paniculatum* seeds and cuttings of *P. askania* to cultivate in their own gardens. This is a significant outcome as it represents that these people have shifted their thinking to connect deeply with these threatened species and are working to integrate their care into their daily lives.

Significantly, this project assisted with the fulfilment of several management objectives required under the NSW Government's SoS program, for at least two threatened species. DPIE were able to add new threatened plant records, map new areas of habitat for threatened species found only on private land, engage with the community to establish needs for further land management activities and knowledge building, gain invitations to conduct further surveys and build new relationships with landholders. These outcomes will assist in satisfying DPIE's mission to secure threatened species in their habitat for 100 years and significantly enhance their links with the communities they service and work with. Finally, the anticipated scholarly outcome – understanding if, and how, the diffusion of systems-based thinking within specific communities works in an applied circumstance, will advance the knowledge base of environmental communication and the discipline of Communication more broadly.

Acknowledgements.

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