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# **FloraCultures: Conserving Perth's Botanical Heritage Through a Digital Repository**

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## **Introduction**

FloraCultures is a 2013 pilot project in development with Kings Park and Botanic Garden in Perth, Western Australia, and funded by Edith Cowan University's Early Career Researcher grant scheme. The project aims to develop a model for documenting the plant-based cultural heritage of 30–50 indigenous species occurring in the Kings Park bushland (Figure 1). The FloraCultures initiative ([www.FloraCultures.org.au](http://www.FloraCultures.org.au)) integrates archival and digital design techniques, creating a unique web portal of potential interest to a range of users—from first-time tourists and amateur naturalists to heritage consultants and environmental conservationists (Figure 2). The initiative reflects the belief that research into environmental heritage (defined broadly to encompass natural and cultural heritage and tangible and intangible theory) is integral to the conservation of flora and fauna in their ecological habitats. The project stresses that the appreciation of biodiversity for its cultural significance helps to sustain broader conservation values.

FloraCultures responds to the increasing pressures forced upon the greater urban environment in which Kings Park is located. The project develops knowledge and practice of plant-based cultural heritage conservation in Perth, one of the world's most ecologically unique cities. According to botanist and outgoing director of the Kew Royal Botanic Gardens, Professor Stephen Hopper, Perth is one of the world's most biodiverse urban

areas, particularly with respect to plant life (quoted in Perth Biodiversity Project, n.d.: 1). However, the continued loss of remnant bushland to development, disease and disregard poses a threat to botanical conservation, whilst also challenging the long-term environmental and cultural sustainability of Perth and other cities globally (Farr, 2012; Hostetler, 2012; Knapp, 2010). In considering the conjunction between natural heritage and biodiversity conservation, the challenge becomes more pressing. The continuity of plant-based cultural heritage (the acronym PBCH will be used intermittently in this paper)

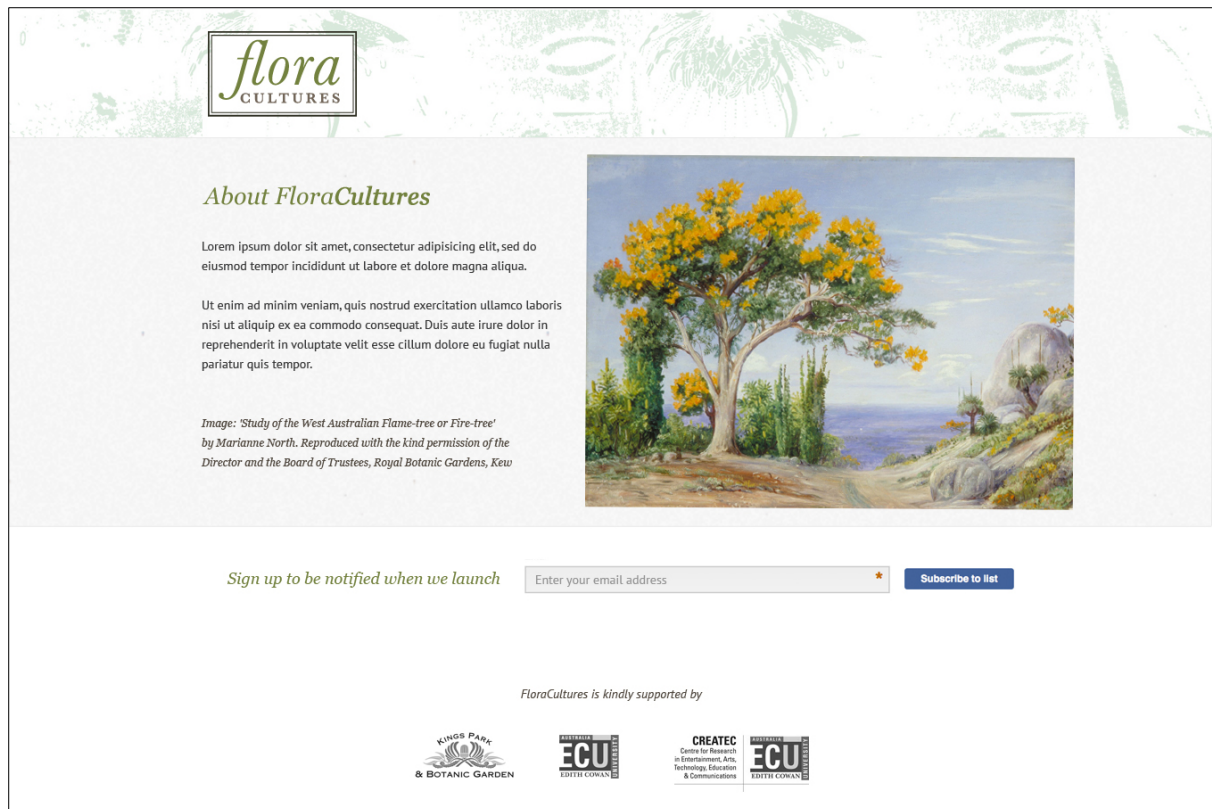


depends intrinsically on the survival of floral and faunal species (Pardo-de-Santayana, Pieroni, and Puri, 2010: 1). Moreover, for the purposes of this discussion, synonymous terms for plant-based cultural heritage will include ‘botanical heritage’, ‘biocultural heritage’ and ‘ethnobotanical heritage’ (Pardo-de-Santayana, Pieroni, and Puri, 2010: 1, 5).

**Figure 1:** Aerial View of Kings Park and Surrounding Suburbs With Bushland Areas Visible in Brown (Image Credit: Kings Park & Botanic Garden <http://www.bgpa.wa.gov.au/kings-park/maps/aerial-view>)

### **Redefining, Documenting and Conserving Urban Plant-Based Cultural Heritage**

The conservation of plant-based cultural heritage in Perth and other Australian cities is endangered by a variety of environmental and social factors, including urban bushland development (McKinney, 2005), the loss of plant species to disease (Shearer, Crane, Barrett, and Cochraine, 2007) and demographic and social shifts in urban areas (Girardet, 2008). In different regions of Australia, the conservation of plant-based cultural heritage has been forwarded through its documentation in print-based works. Key Australia-wide publications, such as *Aboriginal People and their Plants* (2007), unfortunately include only abbreviated references to Western Australian species and tend to exclude non-Aboriginal plant-based heritage information (Clarke, 2007: 80–81).



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### About FloraCultures

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*Image: 'Study of the West Australian Flame-tree or Fire-tree' by Marianne North. Reproduced with the kind permission of the Director and the Board of Trustees, Royal Botanic Gardens, Kew*

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**Figure 2:** The FloraCultures Holding Page Featuring Marianne North’s “Study of the West Australian Flame-tree or Fire-tree” (circa 1880) (Permission to Reproduce Pending) (Design Credit: Adrienne Barba, Horse & Cart Design)

Research into plants, people and heritage production is normally situated within ethnobotany, an interdiscipline combining anthropology and botany and, historically, prioritising Aboriginal Australian knowledges of plants (Clarke, 2007; Hsu, 2010; Isaacs, 1989). Whilst comprehensive ethnobotanical surveys exist for certain regions of Australia (for instance, see Latz, 1995 for Central Australian documentation), relatively little published research on plant-based cultural heritage is available for Western Australia where information remains unrecorded, scarce and dispersed across a range of sources (for representative publications, see Daw, Walley and Keighery, 1997; Meagher, 1974). In other words, the problem of plant-based cultural heritage conservation in Western Australia is compounded by the dispersed nature of knowledge, occurring over a gamut of textual,

visual and oral sources and ranging across cultural traditions, including Aboriginal and non-Aboriginal.

Moreover, definitions of heritage tend to prioritise material or tangible heritage, comprising physical substances (of living plants), cultural artefacts (made from plants) and natural sites (containing plants) (Denes, 2012: 165; Sorensen and Carman, 2009). As a regional example, the *Heritage of Western Australia Act 1990* emphasises structures and places of consequence, defining cultural heritage as ‘the relative value which that place has in terms of its aesthetic, historic, scientific, or social significance, for the present community and future generations’ (Western Australia, 2012: 3). Extrapolating from this definition, the term ‘botanical heritage’ would imply the one-sided conservation of tangible plant-based cultural heritage—including significant living plants (e.g., banksias), their broader habitats (e.g., banksia woodlands) and the enduring materials produced from them (e.g., colonial-era furniture made from banksia wood).

FloraCultures aims for a more inclusive conceptualisation and practice of natural heritage in relation to plants that equally considers, consolidates and conserves diverse forms of heritage. The first form addressed by the initiative is knowledge of Western Australian plants as food, ornamentation, medicine and fibre (Clarke, 2007; Cotton, 1996; Hoffman and Gallaher, 2007; Martin, 2004). The second form is knowledge of plants as literary, artistic and historical objects (Mahood, 2008; Ryan, 2012; Seddon, 2005). The third form is knowledge of plants as sources of community memory, cultural identity and personal well-being, largely derived through ethnographic and oral history techniques (Hitchings, 2003; Hitchings and Jones, 2004; Ryan, 2012; Trigger and Mulcock, 2005).

## **Bridging Tangible and Intangible Plant-Based Cultural Heritage**

FloraCultures develops a holistic framework for plant-based cultural heritage safeguarding that incorporates the conservation of the tangible and intangible heritage values of plants (Leyew, 2011: 157) with specific attention to Perth's flora. The research expands Western Australian environmental heritage theory and practice through the application of a syncretic framework to plant-based cultural heritage. Intangible heritage (ICH or 'intangible cultural heritage') refers to 'forms of cultural heritage that lack physical manifestation. It also evokes that which is untouchable, such as knowledge, memories and feelings' (Stefano, Davis and Corsane, 2012: 1; see also Isar and Anheier, 2011). The 2003 UNESCO *Convention for the Safeguarding of the Intangible Cultural Heritage* lists five manifestations of intangible heritage: '(1) oral traditions and expressions, including language as a vehicle of ... intangible cultural heritage; (2) performing arts; (3) social practices, rituals and festive events; (4) knowledge and practices concerning nature and the universe; and (5) traditional craftsmanship' (UNESCO, 2003: 2). Many plant-based cultural heritage researchers regard the UNESCO convention as a 'turning point [for] ethnobiology and ethnosciences [in] recognising all orally transmitted traditional knowledge systems' and the need for further research into their safeguarding and conservation (Pardo-de-Santayana, et al., 2010: 11).

The category 'knowledge and practices concerning nature' is of particular relevance to FloraCultures. A plant-based heritage resource, linking intangible and tangible heritage, has not yet been envisioned, designed or produced in Western Australia. In comparison, and particularly since the 1970s, scientific knowledge of Western Australian plants has been increasingly promoted, funded and consolidated. Technical knowledge of Perth-area plants is available through online sources, such as FloraBase, and key print publications, most

notably *Flora of the Perth Region* (Marchant et al., 1987) and *Perth Plants* (Barrett and Pin Tay, 2005). UP TO HERE Developed by the Western Australian Herbarium and released online in 1998, FloraBase is the 'authoritative source' for plant knowledge in the state (Department of Environment and Conservation, 2012). FloraBase provides a free, open-access tool for researching topics such as the scientific and common names of plants; the conservation status of different species; the taxonomic features aiding identification; and species distributions. Moreover, the database includes colour photos of the major features of most of the 10,000 Western Australian plants. In its breadth and completeness, FloraBase has contributed substantially to the promotion of plant-based *scientific* heritage in Western Australia over the last fifteen years. The FloraCultures portal will complement FloraBase, fostering a productive dialogue between the botanical arts and sciences in the State.

Whilst a comprehensive resource for Western Australian plant-based *cultural* heritage has not been published or developed, noteworthy examples of digital platforms for PBCH promotion do exist elsewhere. The Native American Ethnobotany Database, managed by the University of Michigan (U.S.A.), highlights the uses of plants as food, fibres and medicines in Aboriginal North American societies (University of Michigan, 2003). For example, a search for 'maple' yields multiple ethnobotanical references, found in historical documentation, to the plant's use as medicine, material and food by Native American people. Moreover, the website Plant Cultures, supported by Royal Botanic Gardens, Kew, showcases the uses of 25 prominent South Asian plants, including banyan, cardamom, garlic, ginger, mango and turmeric. The website is eclectic in its knowledge base and expansive in its selected media, bringing together 'historic images from museums and libraries, well researched information, contributions from members of the public, and carefully chosen links to other web resources' (Kew, 2005). For Western Australian plants,



limited ethnobotanical information—such as interview material and Aboriginal nomenclature—is included in the website Nidja Beeliar Boodjar Noonookury Nyininy or A Nyungar Interpretive History of the Use of Boodjar in the Vicinity of Murdoch University, Perth, Western Australia (Murdoch University, 2003).

### **The FloraCultures Methodology: Combining Archival and Digital Techniques**

The FloraCultures initiative draws from these digital examples in order to fill a Western Australian gap with a searchable archive and educational tool. The project will result in web-based access to the cultural heritage of Perth's indigenous flora, defined broadly as trees, shrubs and herbaceous plants existing in the Swan River area during early nineteenth-century European settlement. Once completed in early 2014, the pilot website will offer a user-friendly platform for the documentation and promotion of urban Australian plant-based cultural heritage. In developing a comprehensive model, the FloraCultures pilot collates Aboriginal, colonial European, recent immigrant, local conservationist and seasonal visitor knowledges of significant Kings Park species. Rather than developing a print-based ethnobotanical resource—comparable, for example, to *Bushfires and Bushtucker: Aboriginal Plant Use in Central Australia* (Latz, 1995)—for Perth and Kings Park, FloraCultures will build an easily updatable digital archive accessible to a wide audience and incorporating non-Indigenous and Indigenous materials.

The 2013 pilot puts forward a dual archival and digital approach to heritage conservation with respect to the highly visible urban botanical reserve of Kings Park and Botanic Garden (Barrett and Pin Tay, 2005; Erickson, 2009). The site is significant for Perth biodiversity because, on average, 6 million people visit Kings Park per annum (pers. comm., M.

Broderick, 14 August 2012). In addition to its visibility, centrality and accessibility, many of Western Australia's iconic and endangered species are represented in the Kings Park bushland reserve (Figure 1). The digital repository maximises public accessibility to the multiple heritage values of 30–50 iconic Kings Park plants, currently in the process of being selected in consultation with Kings Park personnel. FloraCultures is significant for cultural heritage, botanical conservation and environmental education in Western Australia, generally, and Perth, specifically. The research expands the knowledge bases of ethnobotany, environmental education, sustainability studies, heritage studies and digital heritage conservation.

Incorporating tangible and intangible heritage frameworks, the concept of plant-based cultural heritage provides the analytical underpinning of the FloraCultures initiative. Drawing from these conceptual positions, the project engages two interlinked approaches: (a) the identification of the tangible and intangible plant-based cultural heritage of Kings Park as expressed in textual, visual and oral sources; and (b) the archival and display of the research findings for public consumption through a freely accessible and multimedia (i.e., text, images, audio and video) web resource. Hence, the methodology consists of Phase I and Phase II during which distinct but related activities address three research questions: (a) Which Kings Park plants have the strongest heritage values; (b) What kinds of heritage information are most relevant to conserving the overall PBCH of Kings Park; and (c) How can a holistic model of PBCH (including Indigenous and non-Indigenous knowledges as well as tangible and intangible heritages) address gaps in environmental heritage conservation and promotion in Western Australia?

Phase I uses an archival methodology beginning with the documentation of plant-based cultural heritage references in Western Australian sources. At the same time, intangible heritage is being recorded through interviews with individuals with ‘knowledge, memories and feelings’ (Stefano et al., 2012: 1) of Kings Park plants. Whereas Phase I assembles a portrait of plant-based cultural heritage in textual, visual and spoken sources, Phase II focuses on the production of a digital archive, accessible to a variety of users (Figure 2). The archive development showcases current digital design and user interface theories and practices (for example, Cross, 2011; Meinel, 2011), including the use of focus groups, in order to maximise research impact and applicability.

In greater detail, FloraCultures Phase I, ‘Documenting Plant-Based Cultural Heritage’, focuses on researching the representations of iconic Kings Park plants in historical texts (explorers’ diaries, newspaper articles and the published accounts of settlers, visitors and naturalists) (e.g., Millett, 1872; Moore, 1884); literature, including novels (e.g., Lawrence and Skinner, 1924), poetry (e.g., Alexander, 1979; Kinsella, 2005) and short stories; visual art (sketches, paintings, illustrations and photography) (e.g., Nikulinsky and Hopper, 2005); music (e.g., Grainger, 1985); and film (e.g., Graham, 1990). The references provided here are representative of the spectrum of materials that is being curated for inclusion in the repository. Throughout 2013, archival research is being conducted at the J.S. Battye Library of WA History; State Records Office (SRO); Private Archives Collection at the State Library; State Library’s Pictorial Collection; Trove Digital Archive of the National Library of Australia; WA Museum; Edith Cowan University Library; UWA Library; and relevant private archives and collections at Kings Park and Perth suburbs. The selection of archival material focuses on prominent plants—such as kangaroo paws, discussed in the next section—that figure

recurringly in archival sources and are integral to the plant-based cultural heritage of Western Australia. Additionally, the curatorial process attempts to balance textual, visual and audio materials of strong heritage value as per the constraints of the online format and copyright restrictions.

Moreover, throughout Phase I, Aboriginal Australian PBCH is being identified in various textual, visual and oral accounts (e.g., Bates, 1930), assessed by an Indigenous Heritage Consultant and, subsequently, included or excluded. Additionally, the Phase I interview component documents the spoken accounts of Kings Park conservationists and other individuals with long-standing links to the area's flora. I record this intangible heritage information with a hand-held digital device and subsequently transcribe the conversations. The interviews are approximately one hour in duration, semi-structured in format and focused on recording the 'knowledge, memories and feelings' (Stefano, et al., 2012: 1) of 6–10 interviewees, identified between January and June 2013 (for a fuller treatment of the concept of "botanical memory," see Ryan, 2012).

FloraCultures Phase II, 'Disseminating Plant-Based Cultural Heritage', focuses on digital design and development. This phase begins with focus groups between January and June 2013. In keeping with user-engaged design principles, two- to three-hour long meetings with Kings Park volunteers and guides help to establish: (a) the digital archive features of most potential benefit to users; (b) species to feature within the archive; and (c) interviewees to contact. The focus groups will result in a set of recommendations (including a list of plant species and potential interviewees) that will be incorporated into the design process. The construction of the web portal will mostly take place between April and

September 2013. I work closely with a professional Digital Development Consultant to ensure satisfactory incorporation of the focus group recommendations. After the production of a prototype and between October and December 2013, I will then organise

training sessions for Kings Park personnel and the general public. The sessions will address: (a) the concept of plant-based cultural heritage; (b) the use of the information for educational purposes; and (c) the navigation of the web resource. The portal's promotion, maintenance and possible migration will be addressed in detail at the end of 2013 and in early 2014.

### **The Gift of Blood: Catspaws and Kangaroo Paws (*Anigozanthos* spp.)**

In order to demonstrate the kinds of data that will be featured in the FloraCultures web archive, I will briefly sketch the plant-based cultural heritage of the catspaws (*Anigozanthos humilis*) and kangaroo paws (*Anigozanthos manglesii*) using the combined tangible and



**Figure 3:** Catspaw Featured on Right By Artist Unknown (from John Lindley's *A Sketch of the Vegetation*, 1840) (Image Credit: Wikimedia Commons)



**Figure 4:** Catspaw by Marian Ellis Rowan (1880, watercolour and gouache on paper) (Image Credit: Trove, <http://trove.nla.gov.au/version/20341001>)



intangible heritage framework. In doing so, I will touch upon the three categories of plant-

based cultural heritage that distinguish FloraCultures from other ethnobotanical resources, both print or online: (a) knowledge of plants as food, ornamentation, medicine and fibre; (b) knowledge of plants as literary, artistic and historical objects; and (c) knowledge of plants as sources of community memory, cultural identity and personal well-being. The research process reveals, for example, that some plant species have more documented uses as food than citations as literary objects; hence the archival information is not symmetrical across species, but rather weighted in most instances towards one or two categories.

Both catspaws and kangaroo paws belong to the Haemodoraceae—the botanical family name derived poetically from *haima* for ‘blood’ and *doron* for ‘gift’. The catspaw genus stems from the descriptive terms *anisos* for ‘unequal’ and *anthos* for ‘flower’, alluding to non-symmetrical lobes of the perianth; and *humilis* for ‘low-growing’. Catspaws are also known by a number of common names including small catspaws, dwarf catspaws, Mogumber catspaws (for the sub-species *chrysanthus*) and tall cat's paw (for the sub-species *grandis*). In terms of traditional knowledge of human uses of catspaws, the plants have been prepared by Nyoongar people—the Aboriginal people of the South-West of Western Australia, including Perth—as a dye. The compound haemocorin causes the reddish-orange colour of the roots, typical of members of the Haemodoraceae family. Moreover, haemocorin is medically significant; the substance is currently being researched for antitumor and antibacterial properties. Regarding the second category of plant-based cultural heritage, knowledge of plants as literary, artistic or historical objects, in 1840, the enterprising British botanist John Lindley commented glowingly that ‘there is a dwarf species still handsomer than they [*A. manglesii* and *flavida*], in consequence of the compactness of the flowers and the short neat foliage; this *A. humilis* would be a handsome

addition to our gardens' (Lindley, 1840: xlvi). Due to its 'handsome' appearance and attractive colouration, the catspaw has been depicted in seminal works of Western Australian botany (Figure 3) and by notable artists such as Australian painter Marian Ellis Rowan (1848–1922) (Figure 4), both of which will be included in FloraCultures pending copyright permissions.

As suggested above, FloraCultures begins the exploration of plant-based cultural heritage with the common, scientific and Nyoongar names for plants. The scientific name for kangaroo paws (*Anigozanthos manglesii*) also derives descriptively from *anisos* for 'unequal' and *anthos* for 'flower', again for the unequal perianth lobes. However, the kangaroo paw species name honours Captain James Mangles (1786–1867), botanical enthusiast, seed trader and cousin of Lady Ellen Stirling, wife of colonial governor James Stirling. Mangles visited the Swan River Colony in 1831 where he also met and began correspondence with Georgiana Molloy (1805–1843), Western Australia's first female botanist and one of the first botanical collectors and seed traders in the colony. The common names for kangaroo paws include red and green kangaroo paw, Mangles kangaroo paw and common green kangaroo paw. Multiple Nyoongar names for kangaroo paws are known: kuttych, kurulbrang, krulbrang, nollamara (coincidentally also the name for a Perth suburb) and yonga marra. For Nyoongar people, kangaroo paws are known traditionally as food sources; the tender, starchy and nutritious rhizomes were consumed before the emergence of the flower. Kangaroo paws also figure prominently in colonial Australian history. In 1834, botanist David Don published in *The British Flower Garden* the first formal description of a cultivated Mangles kangaroo paw: 'This singularly beautiful species of *Anigozanthos* was raised in the garden at Whitmore Lodge, Berks, the seat of Robert Mangles, Esq. from seeds brought



from Swan River by Sir James Stirling, the enterprising governor of that colony, by whom they had been presented to Mr. Mangles' (Don, 1835: 265).



**Figure 5:** Kangaroo Paw Installation at Kings Park and Botanic Garden (Image Credit: Author)

Images of kangaroo paw help to define and communicate contemporary Western Australian character and culture (Figure 5). In the 1860s, the English watercolourist G.C. Fenton included a painting of a kangaroo paw in his *Sketchbook* (<http://nla.gov.au/nla.pic-an5836980>). In 1960, Premier David Brand selected the kangaroo paw as the WA state floral emblem. An image of a kangaroo paw also frames the crown in the Western Australian Coat of Arms. The blazon reads: "And for Crest: On a Wreath or / and Sable The Royal Crown between two Kangaroo Paw (*Anigosanthos* [sic] *Manglesii*) flowers slipped proper." Kangaroo paws are nearly synonymous with wildflower tourism and have been used on impressively designed promotional posters since the 1950s (see, for instance, <http://trove.nla.gov.au/version/7079089>). The species also figure into the state's literary

history (for example, see William Hart-Smith's poem 'Kangaroo-Paw') (<http://andrewlansdown.com/fellow-writers/william-hart-smith/>).

## **Conclusion**

FloraCultures contributes to the conceptualisation, consolidation and conservation of WA heritage. Through the digital platform, the richness and importance of Perth's flora will be showcased to national and international audiences. The strength of FloraCultures is that it works across heritage streams and across different cultural traditions and historical periods. FloraCultures provides a plant-based cultural heritage model for Australian cities through a combination of innovative methodology (archival and digital approaches) and accessible technology (the web archive itself and future social media integrations). Further along in its development, the archive will solicit public contributions of PBCH materials (e.g., photos, stories, diary excerpts, etc.). I believe that the research outcomes will be valuable to diverse parties, including: educators; environmental researchers; historians; cultural heritage managers; biological scientists; community conservationists; wildflower tourists; proprietors of botanical tourism; the mining sector and industries with an ecological restoration component; and others identified in 2013 focus groups. Multiple economic, environmental and cultural benefits will accrue through the promotion of Western Australian ecotourism assets and the development of biocultural heritage management models, urban biodiversity conservation, and sustainability theory and practice in Australian cities.

Once the prototype has been completed, FloraCultures will set a precedent for promoting PBCH. As such, the project has potential benefits for plant-based cultural heritage policy and practice in Western Australia. In forwarding new notions of PBCH, FloraCultures is poised to

impact heritage conservation over time. Firstly, the research expands ethnobotanical practice in Australia by incorporating non-Indigenous knowledges and intangible cultural heritage theories. Secondly, the digital platform and associated methodologies set a precedent for further research into PBCH, presently under-developed and, arguably, threatened in Western Australia. Thirdly, the ethical and copyright issues—particularly regarding Nyoongar intangible heritage and archival material respectively—navigated during the project, especially in the second half of 2013, will be of relevance to subsequent Australian cultural heritage research. Importantly, the prototype will be poised for social media integrations. For example, the development of an iPhone application would connect the repository to a broader user base whilst enhancing its educational possibilities.

FloraCultures will foster further academic engagement with Kings Park, to promote the heritage value of its plants and to contribute to a broader recognition of Western Australian plant life—two of the institution’s core aims. FloraCultures also contributes uniquely to two National Research Priorities: *An Environmentally Sustainable Australia* (Goal 5: Sustainable Use of Australia’s Biodiversity) and *Promoting and Maintaining Good Health* (Goal 4: Strengthening Australia’s Social and Economic Fabric). The Project develops strategies for conserving the heritage values of Australia’s terrestrial biodiversity. By foregrounding the long-term social and cultural significance of biodiversity to Australian natural heritage (both tangible and intangible), the outcomes will contribute to the conservation of biodiversity for both its *inherent value* and *economic benefits*, especially to the tourism sector. Moreover, the project aligns with Australia’s National Landscapes Program and the Tourism 2020 initiative for developing promotional strategies for natural and cultural heritage. As the fastest growing segment of Australian tourism, ecotourism (including wildflower tourism)

will be fostered. FloraCultures contributes to the second NRP by strengthening Australia's social and economic fabric through sustained community engagement. In building the capacity of communities for heritage conservation, the project will enhance the potential for *healthy, productive, and fulfilling* lives in Western Australia.

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