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Becoming-Urban, Becoming-Forest: A History of Urban Forest Projects in Australia.

In recent times, local governments in Australia's major cities have embraced the idea that the trees in their streets, parks and private gardens are parts of a collective urban forest that can be managed to address complex policy problems and create more liveable and sustainable cities. In light of this, applied and critical urban forest researchers have typically focused on questions of quantity with regard to some of the factors that influence the density and distribution of urban tree cover. In a few cases, however, researchers have documented qualitative changes to the urban trees and woodlands that ostensibly constitute the urban forest, suggesting it might be apprehended in a more mutable and dynamic way. Building on these accounts, we turn to Deleuze and Guattari's (2013a, 2013b) theory of becoming to read the urban forest in an active and malleable light, developing a history of urban forestry in Australia that discerns three urban forest projects we call the 'forest in a city', the 'city forest', and a new but not yet realised, 'city in a forest'. This finding renders the urban forest in more contingent, multiple and mutable terms, leading us to finish the paper with a consideration of what seeing the urban forest as becoming means for urban forest research. There, we suggest that Deleuze and Guattari's becoming directs us to different kinds of empirical, political, and ethical concerns that haven't received significant interest in the current literature. These include asking how, why, and with what consequences do particular styles of urban forestry emerge at particular space-times. How is qualitative difference and urban forest multiplicity dealt with in practice, as well as focusing on affect and everyday embodied encounters between people and trees in different urban places.

1 INTRODUCTION

How many trees make a forest? We think of trees making a forest, but in nineteenth-century Australia it was grass that made a forest. Although there was some variation in the word's use, 'forest' generally described a woodland area fit to graze. It was a term invested with the pastoral vision. 'Forest' was not impenetrable or difficult to travel through like 'scrub' or 'brush'; it was an open landscape with large trees, little undergrowth and abundant grass (Griffiths, 2002, p. 379).

In recent times, local governments in Australia's major cities and regional centres have embraced the idea that the trees in their streets, parks, and private gardens are parts of a collective *urban forest*. In the City of Melbourne (2012) and City of Sydney (2013), for example, managing individual trees as an urban forest is described as one way to address complex policy problems, foster greater community health and wellbeing, and create more liveable and sustainable cities. These sentiments are shared by municipalities in Brisbane, Perth, Adelaide, Canberra and Newcastle, where the urban forest is defined as all the trees and wooded spaces in a local government area (see: City of Newcastle, 2007a). Represented as the percentage of tree canopy covering a city area, the urban forest is described as the sum of its arboreal parts (NSW LGA, 2003). It is depicted as a unified body of vegetation where the collective, more than individual trees, is the primary unit to be planned and managed.

As Griffiths (2002) notes in the epigraph, however, it takes more than trees to make a forest. In Australia, the material and symbolic qualities that define what a forest is and does have changed over time in relation to the prevailing moral, political, economic and aesthetic milieu (Dargavel, 1994; Griffiths, 2002). For urban forests, this history alerts us to the partiality of an urban forest defined only by the presence of urban trees. It suggests the urban forest might be constituted by much more than this, with the possibility of finding different ways of

envisioning, defining, and materialising urban forests over time. In this paper, we attend to this possibility by examining changes to urban forestry in Australia since the 1970s. The paper begins by reviewing existing styles of urban forest research, noting their key concerns and conclusions. Much of this literature, we suggest, has focused on quantitative changes in the density and distribution of urban canopy cover, but there are a few cases where researchers have documented qualitative changes to the urban trees and woodlands that ostensibly constitute the urban forest. Building on these accounts, we turn to Deleuze and Guattari's (2013a, 2013b) 'theory of becoming' to read the urban forest in a malleable and active light, developing an historical account that discerns three urban forest projects that we call the 'forest in a city', the 'city forest', and a new but not yet realised, 'city in a forest'. This finding renders the urban forest in more contingent, multiple, and mutable terms and in the final part of the paper we discuss what apprehending the urban forest from a position of Deleuze and Guattari's becoming would mean for future research..

2 WHAT IS AN URBAN FOREST?

Western culture has a long, complex, and variegated relationship with trees, forests, and wooded spaces of various kinds. Forests have meant different things within western cultures (Schama, 1995), but we have commonly seen the forest as some fundamental Other to civilisation and the city (Harrison, 1992). Despite this persistent city/forest dualism, wooded areas have been vital to the making and governing of western cities (Konijnendijk, 2008). In Europe, 'town forestry' refers to a long history of managing peri-urban woodlands for timber, recreation and environmental protection (Forrest & Konijnendijk, 2005; Konijnendijk et al., 2006, p. 97). Alongside the parklands built through the industrial revolution, these woodlands became the 'green lungs' of large cities where their primary purpose was to improve the 'spiritual and bodily hygiene' of the proletariat (Forrest & Konijnendijk, 2005, p. 29).

The trees planted for shade and ornamentation in western cities have served similar ends (Frawley, 2009; Lawrence, 2006) and concern about their care in North America led to a more explicit notion of the urban forest. First used to describe the work of a ‘tree warden’ during the late 19th century (Ricard, 2005, p. 230), urban forestry re-emerged with more currency in the 1960s as forestry researchers like Erik Jorgensen grappled with the Dutch Elm Disease that was devastating urban trees across North America (Dean, 2009). Extending forestry’s scientific approach into arboricultural concerns, Jorgenson’s team sought alternative treatments to the toxic pesticide, DDT, in light of Rachel Carson’s *Silent Spring* and the disrespect Dutch Elm Disease showed to legal boundaries. These conditions supported the development of a cooperative, holistic approach to pest management with an ecological outlook that was cognisant of the relations between trees, insects, micro-organisms, and the human practices that encouraged or controlled the spread of pathogens. It was during this period, Dean (2009) suggests, that we started talking about the ‘urban forest’ more than the individual tree. Jorgensen and others started describing all the trees in a municipal area as an urban forest and writing papers that stressed the importance of trees in the city. An urban forest, Jorgensen argued, was not just a decorative component of the built environment. It also acted as the city’s air conditioner and humidifier, cleaning and cooling the air while providing a sense of stability in a rapidly changing world (Dean, 2009). While town forestry still persists in Europe, the North American notion of the urban forest has become widely accepted, if not the dominant way of defining what an urban forest is (Konijnendijk et al., 2006). Often it is taken for granted, in favour of describing the urban forest as a ‘biogenic infrastructure’ (Pincetl, 2010, p. 43) or ‘biotechnology’ for enhancing city environments (Nowak, 2006, p. 93) because of the ever growing list of benefits that trees provide (Roy et al., 2012). Better living through urban forestry is the mantra written into much professional and public discourse (Murphy, 2014; Schwab, 2009) and researchers have

rightfully dedicated their energy to understanding some factors that make cities more or less treeful places in light of their positive effects. Many social studies, for example, have concentrated on identifying people's attitudes and behaviours towards trees and urban forestry programs (Getz et al., 1982; Hull, 1992; Kirkpatrick et al., 2013a, 2013b; Lohr et al., 2004; Summit & McPherson, 1998). At times, these attitudes and the distribution of urban trees are also correlated with socio-demographic variables to understand how different groups will shape the urban forest by influencing the location and number of urban trees (Jones et al., 2013; Kirkpatrick et al., 2011; Zhang et al., 2007). While they're certainly not homogenous, these studies generally conclude that decision-makers need to address these diverse attitudes and behaviours if they want to conserve or enhance the urban forest by retaining or adding urban trees.

While this research highlights the relations between people's attitudes and changes in urban tree cover, it is part of an applied research program that is described as 'largely uncritical of present power structures' by urban political ecologists (Sandberg et al., 2015a, p. 4). Their agenda, in contrast, has focused on environmental justice and the socio-economic factors that unevenly distribute the benefits of trees and urban forestry to privileged social groups (Heynen, 2003; Heynen et al., 2007; Perkins et al., 2004). Trees, they suggest, are a commodity and so the logics of neoliberal capitalism shape the density and geography of the urban forest. Here, studies show that a vibrant urban forest has become part of inter-urban competition for capital investment, while its ecological effects are subordinated to economic objectives (Whitehead, 2003) and neoliberal governance reduces the state's capacity to renew their urban tree stock (Heynen & Perkins, 2005; Pincetl, 2010). The conclusion, generally, is that the location and number of urban trees is shaped by 'markets, race, class, and gender' so that the urban forest is a 'social nature' and not just an apolitical biotechnology (Perkins, 2015, p. 19).

Urban political ecologists have brought a critical edge to a predominately applied literature, but both styles of urban forest research tend to focus on questions of quantity with regard to changes in the density and distribution of urban tree cover. In a few cases, however, researchers have focused on qualitative difference and the changing ‘nature’ of the urban trees and woodlands that ostensibly constitute the urban forest. As Seamans (2013) did in California, Davison and Kirkpatrick (2014) chart the transformation of Australia’s urban trees from objects of beautification to key assets in the delivery of essential services to the city. They found that professional arborists are playing a vital role in the remaking or ‘re-invention’ of urban trees in conjunction with wider trends in arboricultural research, environmental politics and urban form (Davison & Kirkpatrick, 2014, p. 146). Compared to other professions engaged in urban sustainability, Davison and Kirkpatrick (2014) suggest arborists are contributing new practices, technologies, and knowledges that are materialising less dualistic relations between a city’s built and natural environments. Interestingly, these relations also feature in Konijnendijk’s (2008) work on the ‘city forests’ or ‘urban woodlands’ that are part of Europe’s tradition of town forestry. In this case, urban woodlands are described as cultural landscapes that take different material semiotic forms through dynamic relationships between nature, urbanising society, their cultural imaginaries, modes of resource management, and sense of place over time. In describing the forests of fear, power, subsistence, spirituality, wilderness, health, and conflict to name a few, Konijnendijk (2008) shows how different ways of making an urban woodland can co-exist over time.

Alongside the fluidity of the Australian forest (Griffiths, 2002), these studies highlight the qualitative mutability and multiplicity of urban trees and woodlands, suggesting the urban forest might be apprehended in a similarly dynamic way. Building on this lead and the urban geography that suggests cities are produced through the practices and relations of more-than-human actors (Braun, 2005, 2008), we turn to Deleuze and Guattari’s ‘theory of becoming’ to

read the urban forest in a malleable and active light (McCormack, 2009, p. 277). While some existing scholarship has focused on fixing a fairly singular definition of the urban forest (Konijnendijk et al., 2006; Randrup et al., 2005), Deleuze and Guattari's becoming directs our attention to qualitative difference, multiplicity, and the processes and forces that make natures in particular ways (Hayden, 1997, 1998). Starting from this position, we focus on the emergence of historically situated styles of urban forestry and some of the ideas, events, actors, policies, knowledges, and technologies that have made them possible. By using becoming as a lens for addressing the urban forest, we will show that it is an ongoing achievement that is more complex and contingent than the sum of a city's trees.

To this end, the following section explores some of the changes in Australian urban forestry, beginning in the 1970s when the North American notion of the urban forest was first introduced. While much of the existing literature focuses on quantitative differences in urban tree cover (for good exceptions, see: Sandberg et al., 2015b), we will use a necessarily partial history of urban forestry in Australia to investigate qualitative differences in the material semiotic 'nature' of the urban forest itself. In the spirit of Deleuze and Guattari's becoming, our approach will 'diagnose and evaluate' how an urban forest is enacted in particular space-times while drawing out some of the political and material implications of their making (Hayden, 1998, p. 101). For this reason, we focus on some of the processes, events, and forces that have made and remade the urban forest in Australia, giving rise to its particular styles of becoming along the way. More specifically, we map the emergence of three overlapping and interrelated urban forest 'projects' that we call the 'forest in a city', the 'city forest', and a new but not yet realised, 'city in a forest'.

3 THE URBAN FOREST IN AUSTRALIA

3.1 Forest in a City

The 1970s was a period of significant change in Australia's cities. It was still common to talk of the city and the forest as mutually exclusive spaces (Banks & Sheperd, 1977), but people were fighting to protect urban bushland (Burgmann & Burgmann, 1988) and replanting large numbers of native trees in city streets and gardens (Timms, 2006). People were revaluing Australia's environment at a time when increasing rates of urbanisation and consumption were creating new policy problems and demands on forested land (French, 1975). In this context, some researchers and practitioners of forestry argued for the creation and conservation of wooded areas in and around our cities as a way of addressing these issues (Banks & Sheperd, 1977; Ovington & Hamilton, 1969). One of them was John French, who used conference papers and articles in journals of forestry and park management to argue for the adoption of urban forestry in Australia.

Drawing primarily on the work of Erik Jorgensen and others from North America, French (1977, p. 60) suggested urban forestry could reduce the strain on existing forest resources and help address the 'challenge of a planned urban future' in Australia. Like the woodlands in European cities, French (1975, 1977) believed it was possible to create urban forests in Australia for aesthetic, recreational, economic and ecological purposes. These urban forests, would be areas ranging in size from 0.2 to 800ha that would be composed of systematically and professionally cultivated trees (French, 1975). Larger urban forests could be created on city fringes, with more trees and small wooded spaces provided in densely populated areas. Native trees could be planted and cultivated for timber along nature strips, transport networks, and in recreational areas such as parks and golf courses. Even streets in older suburbs, French (1975, p. 180) added, could 'easily have 3 to 4 rows of native or exotic trees grown along their entire length'.

French (1975, p. 177) suggested this kind of urban forest would be primarily ‘maintained for their aesthetic and recreational values, but they may also be managed for wood products and as wildlife habitat’. The multi-functionality of the urban forest was emphasised, with advocates suggesting it could improve the quality of urban life and produce harvestable food and wood products (Baird, 1986; French, 1975, 1977). This latter function, however, was never realised in favour of urban forests that reflected the broader revaluing of Australia’s environment and the place of native flora in the city. The result was the creation of what Australia’s first urban foresters called BOBITS – bits of bush in the suburbs – that were made to look like simplified versions of Australia’s native forests (Baird, 1986). As one urban forester explained:

Currently the major aim of urban forestry in Victoria is the development of simple stands of trees and understorey that resemble natural forests and cover areas greater than say a typical house block (about one-tenth of a hectare)...Often we are trying to recreate a simple type of stand—something that looks like the bush. Say two or three tall eucalypts, a few shorter tree species such as wattles, sheoaks, paperbarks and teatrees and perhaps some ground plants like grevillea, hopbush, bursaria and tree violet. Plant them all fairly thickly so that in due course they will suppress the grass, reduce the need to mow and look, well, ecological (Baird, 1986, pp. 10-11).

There was a similar approach in Sydney (Duggin & Bartlett, 1976; French, 1983), but urban forestry really flourished in Victoria as a way of addressing the unemployment and urban decline caused by the de-industrialisation of western economies. During the 1980s, the planning and construction of Victoria’s urban forests was concentrated in Melbourne’s western suburbs (Figure 1) after a government review concluded that enhancing the landscape and increasing space for recreation were key to the area’s renewal (Gribbin, 1986).

A job creation scheme, the West Parks Program, was initiated to oversee the planning and construction of urban forests in the western suburbs. This would provide work for the unemployed, while ameliorating the social and environmental conditions that were producing policy problems in these areas (Anon, 1984; Gribbin, 1986).

FIGURE 1 ABOUT HERE

Figure 1. Map showing the location of urban forests in Melbourne that were completed, under construction, or being investigated by 1985. Source: (Gribbin, 1986).

Australia's first urban forests, in other words, were political and moral technologies that manifested old ideas about urban nature and its ameliorative effects on working class people. In the 18th and 19th centuries, it was believed that street trees and parks would improve the 'physical health and moral well-being of city dwellers' by offering places for passive recreation where the 'humbler classes' could mix with their betters (Forrest & Konijnendijk, 2005, p. 33). In the 20th century, City Beautiful and Garden City planning movements argued that enhancing urban landscapes with trees and green space would create a more productive and cohesive society (Freestone, 2001). The concentration of urban forests in the de-industrialising suburbs of Melbourne's west suggests they manifested similar ideas. As a make work scheme that would beautify the landscape and create more space for recreation, these urban forests were not just bits of bush in the suburbs. Their realisation was also disciplinary in that it aimed to change individual behaviour as one response to the local effects of a structural change in the global economy.

Creating urban forests as a local response to global problems was something that also occurred in the 1990s, when Australia's federal government adopted urban forestry as part of a wider response to climate change and sustainable development. Key documents like the Brundtland Report (WCED, 1987) helped put the global environment onto the agenda and the

Australian government identified trees as part of pursuing an 'ecologically sustainable future' (Hawke, 1989, p. 1). As the Prime Minister, Bob Hawke (1989, p. 3), put it,

Trees will help slow the greenhouse effect; they provide habitat for endangered species; they form magnificent wilderness areas and complete forest ecosystems; they ease the burden on our virgin native forests as a source of commercial timber. We need more trees.

Bob Hawke announced a plan to plant one billion trees across Australia in the next decade, alongside other measures such as developing a national strategy to reduce greenhouse gas emissions. This strategy was called *Greenhouse 21C: A Plan of Action for a Sustainable Future* and it included a range of actions to reduce greenhouse gas emissions from Australian cities (DEST, 1995). One of these actions was the construction of urban forests in a \$7.5million expansion to the existing one billion tree program.

It was noted that urban forests would enhance amenity, water quality and the conservation of biodiversity (Stevens, 1996), but these urban forests were morphologically and functionally different to the BOBITS built in Melbourne a decade before. The government's primary objective was to create sinks for greenhouse gases by planting trees along water ways, industrial areas, park lands, schools and parking lots (Stevens, 1996). Ostensibly, these urban forests were not the bits of bush made to look like simplified versions of Australia's native forest. They were a copse of native trees that was closer to French's (1975) proposal to plant trees along nature strips, transport networks and the like. As a means for sequestering carbon, they were also a political technology for addressing policy problems at a different spatial and temporal scale. Namely, the global problem of climate change in the pursuit of an ecologically sustainable future for Australia and the world.

Conceiving and constructing urban forests as a technology governments can use to address the undesirable effects of capitalist development is something that unites these iterations of the urban forest, even if they were directed at different problems in different scales. Notably, they also shared a spatial consistency in that both had quite locally bounded dimensions and were made and managed as pockets of individual forest *within* the city. They were, in short, what we call the ‘forest in a city’ – a particular urban forest project or style of urban forestry that emerged at the intersections of global events and local policy problems, changing values and visions of urban-nature relations, as well as intellectual developments in professional forestry to name a few of the forces at play. During the 1990s, however, another way of making the urban forest became visible. One that an Australian forester predicted would have a more holistic approach, involving the ‘intensive comprehensive management of trees, forests and other natural resources associated with the urban land base’ (Gray, 1988, pp. 89-90).

3.2 City Forest

John French introduced urban forestry to Australia from North America, where it was initially defined as the ‘cultivation and management of trees and forests *within* cities’ (Jorgensen 1974 in French, 1975, p. 177, emphasis added). Soon, however, urban forestry developed a more holistic sensibility where the urban forest was defined as all of the trees and wooded spaces in the area utilised by urban populations (Jorgensen, 1986). While Jorgensen (1986, p. 187) distinguished between a ‘horticultural habitat’ made of individual trees and the ‘forest habitat’ of large woodlands, this line of thinking pushed the urban forest’s conceptual register from a forest in the city towards a forest encompassing an entire urban area. In Australia, this way of envisioning the urban forest became visible during the 1990s, when some municipal arborists began describing all the vegetation in their city as an

urban forest and arguing for urban forestry to become the new paradigm within professional arboriculture.

Although foresters were the early advocates, a general ‘lack of involvement’ by the forestry profession meant arborists and other land managers had taken responsibility for urban forestry in Australia (Gray, 1988, p. 89). Lyndal Plant, for example, was trained in forestry and working as an arborist at Brisbane City Council where she became an early advocate of using ‘urban forest’ to describe all the wooded vegetation in her municipal area. Writing for a special edition on urban forestry in the *Trees and Natural Resources* journal, Plant (1996, p. 6) said that,

The urban forest within the city boundaries is composed of a unique combination of natural and purposely planted vegetation. Fringes and fragments of natural vegetation remain on the hillsides, gullies and along watercourses. The purposely planted ‘forest’ of native and exotic amenity trees occupies the backyards, streets and parks among the developed low lands of the city.

Following Jorgensen (1986), Lyndal Plant defined Brisbane’s urban forest as a collective body of vegetation that was distinguished in terms of a purposely planted, horticultural habitat and a natural forest habitat. She also emphasised the multi-functionality of this urban forest, noting its economic effects and the ‘outstanding contribution’ it made to the ‘liveability of our city’ by providing shade and cooling, reducing pollution, conserving water, providing habitat, adding colour and character to the city, improving property values, and attracting visitors and business (Plant, 1996, p. 8).

Plant (1996) felt the future of Australia’s urban forests would depend on increasing the community’s awareness of these benefits, but it was through efforts to convince local governments and other arborists of urban forestry’s merits that this urban forest project was

further developed. At a series of national conferences on urban tree management, experienced researchers and practitioners of arboriculture like Phil Hewett and Gregory Moore called for a new professional paradigm. Urban forest was already being used as a descriptive term, but Hewett (2002, 2005, 2007) argued the value of trees was still largely underestimated by local governments in what he described as a dysfunctional, reactive and inefficient management regime. Urban trees, it was said, faced a number of serious threats in the 21st century (Hewett, 2002; Moore, 2000) that local governments were not equipped to deal with because they conceived of trees as unrelated individuals that only existed as a cost and risk centre (Hewett, 2002, 2009). That is, there was unsatisfactory consideration of cumulative impacts and local governments costed the planting and maintenance of trees without doing the same for the benefits and services they provided (Hewett, 2002; Moore, 2000).

Costing these benefits had been occurring in North America and Australian arborists began experimenting with software and formulas that financially quantified the services provided by trees from the late 1990s (Hewett, 2002; Killicoat et al., 2002). This trend, as Davison and Kirkpatrick (2014) note, has led to a significant change in the way trees are conceptualised within arboriculture and local government. In line with the general shift towards the commodification of nature (Castree, 2003), the economic valuation of tree benefits has meant the urban forest has become a 'green infrastructure' that delivers quantifiable social, economic and ecological services to the city. What's more, developments in remote sensing technologies and geographical information systems have made it easier to obtain a bird's eye view where tree populations can be measured and mapped in terms of their density and other qualities (Davison & Kirkpatrick, 2014). The result is a metrification of the city's vegetation where the urban forest is increasingly known and represented as the percentage of tree canopy covering a given urban area (see, for example: NSW LGA, 2003).

This way of making the urban forest, in other words, has much more expansive dimensions and numerical qualities than the urban forest projects of state and federal governments from the 1980s. Rather than a forest *in* a city, another style of urban forestry emerged within professional and municipal arboriculture that we can call the ‘city forest’. The ‘city forest’ is seen as encompassing a much greater urban area, where the BOBITS built in places like Melbourne’s west are just parts of a larger urban forest that is also constituted by street trees, parks, private gardens and other wooded spaces. New technologies and techniques have also meant this urban forest is vastly more quantified in terms of its spatial dimensions and material effects. Satellite mapping of tree canopy coverage has provided a visual image of the urban forest as the sum of its arboreal parts, while new knowledges and software programs identify and quantify an increasing range of services and benefits it provides. In the process, the ‘city forest’ project has continued to make the urban forest into a political technology for addressing the undesirable effects of capitalist development like climate change, in addition to securing a more sustainable future for urban trees themselves. As this style of urban forestry has become increasingly part of professional and municipal arboriculture, it has also institutionalised some conditions that are giving rise to an alternative project. Informed by a metabolic vision of the city, the development and adoption of the city forest by Australia’s local governments and municipal arborists involves new ways of thinking about urban-nature relations, as another way of making the urban forest seems to be emerging within local government thought and practice.

3.3 City in a Forest

From the early 2000s, arborists were using national conferences to suggest increasing concern about climate change, sustainability, urbanisation and other issues were opportunities to promote the value of trees and urban forestry to policy makers (Johnson, 2003). This included Phil Hewett (2002, 2005), head arborist at Newcastle City Council, who said it was

a critical time to institutionalise urban forestry because local governments were rethinking how they planned, built, and managed cities to meet the challenges of the 21st century. This rethinking process, however, was also true for Hewett and other arborists involved in developing formal urban forest policies for Australia's local governments. Informed by a metabolic vision of the city, the urban forest policies adopted by local governments in the last fifteen years involve new ways of thinking about the relations between cities, their environment, their people, and the production of a particular urban milieu.

Australians had long believed that arboriculture did not require specialist skills and many of those responsible for managing trees had no training at all (Davison & Kirkpatrick, 2014). As Australian arboriculture matured, it was influenced by concepts like urban forestry from North America (Davison & Kirkpatrick, 2014), as well as new evidence showing the role trees played in moderating a city's hydrological, material, chemical, and even emotional flows (Hewett, 2002, 2007). This metabolic vision of the city was adopted by arborists and written into the urban forest policies developed for organisations like the NSW Local Government Association (2003) and the City of Newcastle (2007a, 2007b). In these cases, the services provided by urban forests are described as essential for sustaining human life in an urban ecosystem where dynamic and complex interactions occur between humans, natural processes, the built environment and other living organisms. The urban forest is seen as a primary element in this urban ecosystem and their influence on the way cities work and feel means local councils like the City of Newcastle (2007a, p. 3) believe they have an 'important role to play in achieving a healthy, liveable and sustainable city'.

While these are highly desirable goals, the implication of urban forestry in their realisation points to the fixing of extended functions for an urban forest that government can use to condition the city and its population at increasingly macro and micro scales. The City of Melbourne (2012), for example, foregrounds the multiple contributions trees make to

people's physical health and emotional well-being, as well as suggesting the urban forest will encourage active and satisfying lifestyles, greater community cohesion, and help create a shared sense of identity. This goes well beyond creating work for the unemployed or sequestering carbon to intervene in the atmospheres, sensations, and subjectivities that make up the less tangible and more intimate features of urban life. It makes the urban forest a biopolitical technology for shaping populations in fairly microscopic and covert ways (see: Braverman, 2008), at the same time it is directed at the very macro level of the city as a whole. As they have overseas (Heynen & Perkins, 2005), urban forestry in Australia is becoming part of wider strategies for giving cities a clean, green and marketable image that helps them compete against other cities for flows of capital and people. In Brisbane, for example, creating a distinctly sub-tropical looking landscape is part of a plan to become Australia's 'new world city' (Brisbane City Council, 2013, p. 1). The City of Sydney enrolls the urban forest into their own regime of global city brand building (Sweeney, 2009), as does the City of Melbourne (2012, p. 5) where the vision for the future is about creating a 'city within the forest rather than a forest within a city.'

Emerging from the rise of the 'city forest', in other words, is another style of urban forestry that we can call the 'city in a forest'. Although it is yet to be fully realised, it does suggest the dimensions and qualities that define the urban forest could be shifting again. Where the urban forest was and sometimes continues to be made and managed as a pocket of individual forest *within* the city (see: City of Stonnington, 2010), the 'city in a forest' project would reverse this relation between the urban's built and natural environments. Even in its localised guise, this vision of a more ecologically resituated urbanity can be read as influenced by the metabolic thinking that is becoming part of municipal arboriculture and local government planning. Here, the urban forest is seen as a primary moderator of the material and immaterial flows through a metropolitan ecosystem, but wider changes in the political economy of cities

is also investing urban trees and woodlands with emerging qualities and responsibilities. As part of a shift from managerial to entrepreneurial styles of governance, inter-urban competition has intensified and governments have focused on creating the right climate for capital by making cities seem innovative and global, as well as healthy, liveable and sustainable among other features (Harvey, 1989; Jonas & While, 2007). In this context, the ‘city in a forest’ frames the urban forest as an instrument for achieving competitive advantage in the service of capital accumulation. Whereas the ‘city forest’ is a primarily reactive program responding to the uncertain future of urban tree canopy cover, the ‘city in a forest’ lends the urban forest proactive responsibilities for building a city’s brand and helping to lure ‘highly mobile and flexible production, financial, and consumption flows into its space’ (Harvey, 1989, p. 11).

4 BECOMING & THE URBAN FOREST

How often have you heard the expression “Sydney or the bush”? It has the connotation of city and bush being two vastly different places in terms of lifestyle and employment opportunities. But many of the attractive parts of Sydney in which to live could be described as “Sydney and the bush” (Banks & Sheperd, 1977, p. 27).

In *Forests: The Shadow of Civilisation*, Harrison (1992, p. 2) writes that the ‘mythic forests of antiquity stand opposed to the city in some fundamental way.’ Despite the proliferation of forest cultures across the western world (Schama, 1995), there is a line of continuity running through our history that positions the forest at the ‘provincial edge of Western civilisation, in the literal as well as imaginative domains’ (Harrison, 1992, p. 247). This is equally true of Australia, where a term like ‘Sydney or the bush’ speaks to a ruggedly persistent division between the city and the forest in the minds of an overwhelmingly urban nation. In this context, the rise of the North American notion of an urban forest from the 1970s is an

intriguing development that challenges and changes still held conceptions of what and where a forest *is*, opening more space for us to think and act in terms of ‘Sydney and the bush’. Far more than just the sum of its trees, the story we’ve presented points to the ongoing production of the urban forest as different multi-scalar forces and events arise and intersect at particular space-times. Following Deleuze and Guattari (2013a, 2013b), we can think of this production and the qualitative differences it has produced as a process of becoming – one where the erstwhile forest at the edge of civilisation is *becoming-urban* through the styles of urban forestry we have called the ‘forest in a city’ and the ‘city forest’. While some emerging trends speak to a nascent *becoming-forest* of the urban as the ‘city in a forest’ enters the horizon of local government thought and practice.

In this sense, qualitative changes to urban forestry in Australia collectively create alternative ways of making the relations between the city and the forest, but what does it mean to say the urban forest is becoming in the spirit of Deleuze and Guattari’s philosophy? Becoming is a minor tradition of western thought that posits a dynamic and mutable reality in contrast to the major tradition of ‘being’ that would see the urban forest as a pre-given entity with a fairly fixed and universal form (McCormack, 2009). Most obviously, then, apprehending the urban forest as becoming lends it a fluid sense of the real that calls on researchers to investigate how, why, and with what consequences do particular styles of urban forestry emerge in particular space-times. As we have demonstrated in this paper, three urban forest projects can be discerned in Australia from the 1970s that share continuities and discontinuities in terms of their spatial, material, functional and political qualities. The ‘forest in a city’ project, for example, was initially forwarded by foresters as a way of reducing the strain on commercial forests by providing alternative sources of wood products and other services to urban communities. In the hands of state and federal governments, however, this style of urban forestry was directed at the global problem of climate change, as well as the urban decline

and unemployment caused by the de-industrialisation of western economies. Similarly, the 'city forest' is still emerging as an arboricultural response to the threats facing urban trees in the 21st century. Only for a nascent 'city in a forest' project to make the urban forest into a global city brand builder that can help cities compete against one another for flows of capital.

As each of these projects invests the city's vegetation with certain features and responsibilities, it is worth asking what they make more or less possible in terms of the trees and affiliated animals that are welcome in urban places and the modes of human-tree sociality that are privileged in the process. As Gulsrud and Ooi (2015) note, Singapore's 'City in a Garden' greening project has folded urban nature into a regime of entrepreneurial governance with direct impacts on the biophysical, social, and political diversity of that city. In this case, decisions about the landscape are primarily determined by its 'economic value and revenue generating potential' so that constructing green spaces of consumption are favoured over conserving ecological spaces for urban habitat or biodiversity (Gulsrud & Ooi, 2015, p. 88). As styles of urban forestry increasingly render the city's vegetation in terms of financial cost-benefit and global city brand building, researchers should explore what wider effects this might have on the way we construct, conserve, and relate to the diversity of trees and wooded spaces in metropolitan areas. To our knowledge, the material ethics of urban forestry remains largely unexplored in a climate where quantification is primarily framed in terms of its utility for making a business case to decision-makers (Randall, 2007; Schiller, 2013) and there is a tendency for practitioners and researchers to assume everyone loves trees and feels privileged by their presence (Braverman, 2008; Kitchen, 2013).

Deleuze and Guattari's theory of becoming animates these currently underappreciated concerns because its fluid sense of the real emphasises the urban forest's mutability and the process of making natures in particular ways (see: Halsey, 2006; Hayden, 1998). Importantly, though, Deleuze and Guattari (2013a, 2013b) insist that our mutable reality is also multiple

with consequences for how we apprehend and evaluate the urban forests under investigation. Rather than a linear development from the ‘forest in a city’ to the ‘city in a forest’, Deleuze and Guattari encourage us to think of these projects as overlapping and interrelated, as different tendencies held together more or less comfortably rather than discrete kinds. To take an example, we have identified the ‘city in a forest’ project with the City of Melbourne’s (2012) urban forest policy, but a cursory look at that document demonstrates it is also a sophisticated response to the threats posed to urban trees in the 21st century. In this case, the ‘city forest’ and the ‘city in the forest’ are concurrent styles of urban forestry emerging from the same organisation, not to mention the federal government is revisiting the ‘forest in a city’ project with their new *20 Million Trees* program (NLP, 2015).

The urban forest, in other words, is more multiple than singular and this multiplicity means researchers should ask how the different urban forest projects are related to one another. Are the ‘city forest’ and the ‘city in a forest’ complimentary projects that further common goals? Or are there times where different styles of urban forestry rub each other the wrong way, creating conflicts that result in one project prevailing over others. What about the urban forest projects emerging from community groups and non-government organisations that we have not had the space to investigate here? The styles of urban forestry we’ve explored in this paper have been professional and governmental projects, but other groups would have their own vision for the ‘urban forest’ even if they might not recognise it in those terms. As Bonta (2005, p. 95) notes in his work on the ‘becoming-local’ of a Honduran conservation area, governmental images of what the forest is and should do are not simply or even fully realised by virtue of expert design and political authority. Rather, they must contend with the multiplicity and lived materiality of the forest, becoming something other as diverse bodies, identities, and spaces are altered and assembled through relations of conflict and cooperation. As the urban forest that delivers financial cost-benefits is a largely professional concern that

isn't really shared by everyday people in Australia (Kirkpatrick et al., 2013a; 2013c), it is worth asking about the relations of conflict and cooperation involved in navigating and enacting different styles of urban forestry. In this way, Deleuze and Guattari's becoming leads us to consider the politics of urban forestry in terms of practice and the handling of qualitative difference, but it also directs us to the messier sets of everyday relations from which multiple ways of living in and with an urban forest might emerge.

In addition to becoming as a general sense of the real, Deleuze and Guattari (2013b, p. 272) write of 'becoming-animal' as a process through which nonhumans gain a 'living significance for us' (Williams, 2013, p. 7). Here, becoming-animal, becoming-tree, or becoming-urban forest is not about imitating or representing their 'natural' qualities with greater accuracy. It is about the 'sensual variations and the variations in ideas' (Williams, 2013, p. 7) that are part of becoming more involved with and attuned to nonhuman life in ways that support their flourishing and becoming too. This process is driven by changes to our sense of self and the inter-bodily sensations that theorists like Deleuze and Guattari call affect (Lawlor, 2008). As Jones (2015) has noted, a large tree in a city square generates cooling shade that we seek out on a hot day. The rustling of its leaves in a gentle breeze creates the 'sub-aural white noise' that permeates place, while the sun rays filtering through its canopy project playful patterns of light into our line of sight (Jones, 2015, p. 119). We may not consciously process or appreciate these sensations amid the hustled flow of everyday life, but researchers argue the affects elicited by these encounters can dispose us to the presence of trees in more or less open and convivial ways (Dewsbury, 2009).

With affect now entering the urban forest literature (Jones, 2015; Pearce et al., 2015), approaching urban forestry with Deleuze and Guattari's becoming calls for a greater focus on the everyday encounters that shape human-tree sociality and our willingness to welcome different plants and animals into our lives. In this vein, researchers should investigate the

range of embodied relations between people and trees in different urban places for the purpose of understanding how an ordinary ethics of mutual flourishing might emerge from the flow of seemingly mundane events. This would extend the agency of trees beyond the anthropocentric confines of ecosystem service provision, while tapping into the generative spirit of Deleuze and Guattari as a compliment to the deconstructive lines of enquiry we've outlined above. To summarise them, we think apprehending the urban forest as becoming calls for more attention to three interrelated aspects of urban forestry that haven't received significant interest in the current literature. Firstly, this involves asking about the material ethics of urban forestry by questioning how, why, and with what consequences do particular urban forest projects emerge in different space-times. Secondly, a shift to becoming invites us to address the politics of navigating the urban forest's multiplicity with an emphasis on how qualitative difference is dealt with in practice. Finally, the figure of 'becoming-animal' calls for much more focus on the everyday ways of living in and with an urban forest. This would concentrate on affect and the generativity of embodied encounter in the hope of cultivating an ethics of mutual flourishing for people, plants, and other nonhumans in the city.

5 CONCLUSION

Deleuze and Guattari (2013b) like to talk about 'lines of flight' and the changes in direction, arrangement, apprehension, and expression that arise from events and encounters between bodies and forces of various kinds. In this paper, we have attempted to follow an admittedly modest line of flight that came from thinking about the urban forest in light of recent shifts in urban geography (Braun, 2005, 2008) and the research that focused on qualitative change in the 'nature' of forests, trees and urban woodlands. To build on their impetus, we have used Deleuze and Guattari's theory of becoming as a way of reading for changes in Australian urban forestry since the 1970s. Rather than an urban forest defined only by the presence of urban trees, our historical account points to the ongoing production of three urban forest

projects that emerge from the intersections of certain ideas, events, actors, policies, knowledges and technologies. Illuminating these interrelated styles of urban forestry puts the ‘nature’ of the urban forest on a more active, mutable and multiple footing, but we have also argued that apprehending the urban forest as always becoming calls for more attention to currently underappreciated concerns.

These concerns speak to our empirical approaches and the political and ethical questions we ask about urban forestry at a time when it is becoming more common in Australia and positioned as a minor panacea by some advocates. As Konijnendijk et al (2005, p. 501) describe it, urban forestry can be a ‘regenerative tool’, a catalyst for change and improvement to our investment decisions and the physical landscape, as well as a ‘prime driver behind pushing the new urban agenda of liveability forward’. We support more treeful cities and do not wish to dull enthusiasm for this project, but we are not certain that the financialisation of the city’s vegetation and its instrumental use as a technology of entrepreneurial governance will always be inherently good either. Rather, there’s likely to be material costs and benefits to the different styles of urban forestry and the lines of enquiry opened up by Deleuze and Guattari’s becoming ensure we carefully attend to them in the service of greater comprehension and understanding. Most importantly, it should also help to keep the urban forest open in our own thought and practice so that it is never just a question of more trees, but also what trees, for whom, and with what effects.

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Figure 1. Map showing the location of urban forests in Melbourne that were completed, under construction, or being investigated by 1985. Source: (Gribbin, 1986)