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Suburban life and the boundaries of nature: resilience and rupture in Australian backyard gardens

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Keywords
Australia, garden, boundaries, ethnography, urban ecology, suburbs

Disciplines
Life Sciences | Physical Sciences and Mathematics | Social and Behavioral Sciences

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Suburban life and the boundaries of nature: resilience and rupture in Australian backyard gardens

Lesley Head and Pat Muir

Despite an academic shift from dualistic to hybrid frameworks of culture/nature relations, separationist paradigms of environmental management have great resilience and vernacular appeal. The conditions under which they are reinforced, maintained or ruptured need more detailed attention because of the urgent environmental challenges of a humanly transformed earth. We draw on research in 265 Australian backyard gardens, focusing on two themes where conceptual and material bounding practices intertwine; spatial boundary-making and native plants. We trace the resilience of separationist approaches in the Australian context to the overlay of indigeneity/non-indigeneity atop other dualisms, and their rupture to situations of close everyday engagement between people, plants, water and birds. Our ethnographic methods show that gardens are places where both attitudes and practices can change in the process of such engagements. In a world where questions of sustainability are increasingly driven by cities and their residents, these chains of agency help identify areas of hope and transformative potential as well as concern.

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Introduction

A stone's throw from Australia's largest steelworks, Lorenzo and Caterina[1] live adjacent to a small formal reserve that helps protect a remnant stand of *Eucalyptus maculata* (Spotted Gum) in the middle of the suburbs. It cannot be built on. Lorenzo and Caterina's backyard is dominated by an extensive and productive vegetable garden and chook[2] shed that maintain traditions they brought from Italy more than 40 years ago. Lorenzo has established some small vegetable beds out on the reserve, where he also grazes his rabbits in their mobile hutch. He is very careful to protect seedlings of *E. maculata*, which he marks with stakes and tape, and is in active discussions with the local City Council officers about these activities. In talking about his garden, Lorenzo does not talk about endangered species. His narrative is about productivity and family and about being involved with the soil. However, the outcome is ongoing stewardship of a locally endangered species. For Lorenzo, if the *E. maculata* go, the reserve status of the spare blocks goes, and they would be sold off. People building a new house on such prime real estate are unlikely to be happy about a large and sometimes noisy chook shed and richly perfumed compost pits right on their boundary. For the moment, protecting *E. maculata* gives Lorenzo a buffer to pursue his intensive production without upsetting any neighbours.

On the other side of the hill lives Kris, an environmental scientist. The remnant stand of *E. maculata* and other eucalypts was the reason she bought her block, which contains a number of very large spotted gums. She has been actively trying to restore the native vegetation, including *E. maculata* seedlings and associated understorey vegetation, since she moved in: 'it was just lawn and trees and azaleas and

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geraniums . . . and a whole lot of other pests so I have been trying to reintroduce the native vegetation'.

In framing her thinking in terms of advocating 'a merging of the Australian natural environment and our living environment', Kris nevertheless has strong views about which parts of 'our living environment' should be tolerated. She is in varying levels of conflict with the neighbours on her three boundaries, each of whom has a different attitude to trees in general and natives in particular.

Further down the hill, in Innes's backyard, the strongest impression for the visitor is of order and tidiness. Innes describes this area as being like a 'small house', which it is necessary to look after, clean and decorate. Under current water restrictions she cannot keep it as clean as she would like, but when they are over, she plans to 'clean it up like a vacuum cleaner' with the hose. When Innes mows her lawn or feeds her roses she sees herself as loving and nurturing a backyard which is 'everything in my heart'. Despite, or perhaps because of, her demanding full-time job, her morning routine begins with half an hour in the garden, looking at every plant, checking its needs and watering when necessary. This is a time that 'makes me relaxed', when she notes the cycles of plants and their flowering, and plans what she needs to do for them in the next few weeks.

According to the conventional wisdom about settler Australian environmental relations, Innes is alienated from nature through taming and domesticating it, and Lorenzo is projecting a European ethic onto it, rather than coming to terms with the essence of Australian nature. Kris's backyard work would be seen as representing the appropriate conservationist response, but because it is undertaken in an industrial city it would be deemed far less important than her professional work in nature protection outside the city. Indeed, all three backyards would be deemed peripheral to the urgent work of protecting the 'real' nature in remote areas. There are two central divides, or dualisms, in this wisdom; between an immigrant Australian nation and their environment, and between nature and the city.

It is now a truism that these are just two of the culture/nature dualisms dismantled, or at least unsettled, by recent research in geography and related disciplines. Wilderness has been shown to be saturated, both materially and symbolically, with culture. The city is itself saturated with nature, and is enmeshed with non-urban landscapes through intricate networks for the transfer of goods and services. New conceptualizations framed around hybridity and networks provide theoretical models for approaching the complex entanglements of humans and nature in an age of accelerating urbanization and earth surface processes pervaded by human agency. Thus we can think of the networks that currently protect *E. maculata* in Wollongong as including not only the legal instrument of formal reserve status, but also intensive vegetable production on private land, rabbit grazing on public land, and restoration of native understorey vegetation on private land. More distantly in time and space, they connect to the production of Kris's vegetables in agricultural spaces outside the city, and the historical circumstances that brought hundreds of thousands of immigrants like Lorenzo and Caterina to Australia in the decades after the Second World War. These networks have both resilient and unstable characteristics; they are currently held in place by personal passions and a sometimes fraught configuration of neighbourly relations.

Despite both conceptual and empirical challenges, the separationist paradigm of environmental management has great resilience and vernacular appeal. Protected area management in many parts of the world continues with the ideal of fencing off nature from human presence and influence. Natural heritage and cultural heritage are frequently managed by different agencies, or different parts of a single agency, although they may be part of the same landscape. As Castree argues,

> it would be wrong to think that nature no longer matters . . . academia may confidently declare that there never was a Maginot line dividing natural things from social things. But in several walks of life people continue to speak and act as though such a divide were self-evident . . . there is a continuing need for close analysis of nature-talk in any and all realms of society. (Castree 2004, 191)

The conditions under which separationist views of nature and culture are reinforced, maintained or ruptured need much more detailed attention by geographers and others. We focus here on nature-talk in suburban gardens, taking seriously the lived human experience of non-human nature in urban Australia. Lorenzo, Kris and Innes each engage with the non-human world through their bodily labour using all their senses. They are not alienated, but embedded within it, albeit in very different ways. Analysing their and others' 'environmental cultures' provides a means to identify shared

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Table I Some environmental dualisms, and examples of the liminal spaces between them. (The liminal spaces are not suggested to line up with a particular dualism. Indeed their liminal status often derives from the fact that they transgress several dualisms)

Nature	*Liminality*	*Culture*
Sciences	*Suburbs, backyards, ferals, some Aboriginal people, environmental weeds, some migrants, invasive aliens (human and non-human), hunter-gatherers*	Humanities
Country		City
Wild/savage		Tame/domestic
Protected area		Unprotected
Natural heritage		Cultural heritage
Native		Non-native (except some Aborigines)
Deep past		Present

understandings and differences in a diverse society. It is often argued, in Australia and elsewhere, that we need significant cultural change to address problems of environmental sustainability that research shows to be significant, urgent, complex and to a high degree the product of human activity (Commonwealth of Australia 2001). In fact however our environmental cultures have received only a fraction of the research attention that has been invested so productively into understanding the scientific dimensions of sustainability.

Before presenting our empirical results, we site the study in several related bodies of literature in which questions of spatial and conceptual boundary-making have been prominent; cities as places of nature, and hybridity and the garden. An additional consideration is the extent to which purificationist perspectives are particularly strong in settler societies, where questions of belonging apply not just to types of plants or animals, but also to the indigeneity of the settler. Our examples illustrate the intertwined relationships between material outcomes and conceptual framings when it comes to bounding practices, focusing on human engagements with plants. We conclude by considering some implications of this research for wider questions of urban sustainability and environmental management.

Binaries and boundaries

The literature on 'nature-talk' in geography and elsewhere is now huge (for a recent review, see Castree 2005). The path we cut through it starts with Sibley's (1988 1995 2001) influential work on the making of social and spatial classifications and boundaries, which drew in turn on that of anthropologist Mary Douglas (1966). In illustrating how different cultural groups order the world, Douglas argued that the classification systems (albeit themselves all different) leave certain things not belonging. In different ways, these come to be labelled dirt, i.e. disorder, or matter out of place.

> Where there is dirt there is system. Dirt is the by-product of a systematic ordering and classification of matter, in so far as ordering involves rejecting inappropriate elements. (Douglas 1966, 35)

Eliminating dirt then 'is not a negative movement, but a positive effort to organise the environment' (1966, 2). The need to make sense of the world results in classification into sets, but this always leaves some things not belonging. This 'creates liminal zones or spaces of ambiguity and discontinuity' (Sibley 1995, 33). The connected set of dualisms discussed in this paper, and the liminalities between them, are summarized in Table I. Sibley showed how this can lead into exclusionary practices in the wider society.

> Exclusionary discourse draws particularly on colour, disease, animals, sexuality and nature, but they all come back to the idea of dirt as a signifier of imperfection and inferiority. (Sibley 1995, 14)

Thus for example, gypsies are represented as rats coming out of sewers, slum clearance is associated with moral cleansing, and residents oppose the siting of an AIDS hospice in their neighbourhood (Wilton 1998). People are designated as weeds to denote their being 'out of place' (Cresswell 1997).

A shared human need for order, however, does not explain why binary classifications are so strong in Western thought and practice. Binary divisions of space in the city, Sibley argued, 'are deeply rooted in Western societies because of the ways "Western selves" are constructed, socially and materially' (2001, 243). He drew on psychoanalytic theory to answer what for him is the key question: 'how

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does the self emerge from the union of mother and infant?' (Sibley 2001, 243). The bounding process 'is initially manifest in a distaste for bodily residues but then assumes a much wider cultural significance' (Sibley 1995, 7), as a set of good/bad categorizations are imposed on self and both human and non-human others.

> Experience of the world in childhood also involves the confirmation of the boundaries of the self and situating the self in the social world through the sorting of people and things into 'good' and 'bad' categories. 'Good' and 'bad' enter the unconscious and, in the process of socialisation, they are projected onto others who become the objects of fears and desires. (Sibley 2001, 244)

Exclusionary practices and maintenance of boundaries are a response to the anxiety created by the liminal state:

> the urge to make separations, between clean and dirty, ordered and disordered, 'us' and 'them', that is, to expel the abject, is encouraged in western cultures, creating feelings of anxiety because such separations can never finally be achieved. (Sibley 1995, 8)

As the body shows by its dependence on inputs of food and outputs of excrement, and as the city shows at a wider scale (Kaika 2005), we are tightly embedded in a set of relations that are both material and social.

Ideas of hybridity and networks are thus being utilized to more effectively understand such places and processes (Latour 1993; Whatmore 2002). There is a particular challenge here to studies of the garden, perhaps the classic 'hybrid' landscape within geographic and anthropological thought.

> [T]he garden has long served as a way of thinking about nature and about culture and how each influences the other. The garden has been viewed philosophically as the balancing point between human control on one hand and wild nature on the other. (Francis and Hester 1990, 2)

Gardens carry additional baggage in relation to ideas of hybridity, since they are key places where hybridization – understood biologically as the mixing of two pure species to create something new and usually sterile – occurs. Whatmore's elaboration of hybridity is explicitly different to the idea of 'mixing' pre-existing essentialized categories, whether nature and society, or different varieties of soybean.[3] As she shows in debates over Plant Genetic Resources (PGR):

> Nature and culture do not divulge themselves in the fabric of plants like some sort of botanical apartheid that marks out the wild and the domesticated as certain kinds. But neither are they merely the project of human categories on to an object that makes no difference to their effectivity. Rather, PGR emerge as a socio-material fabrication in which the histories and geographies of more than vegetative associations that they make flesh are constituted through *and* constitutive of this ordering event. (Whatmore 2002, 98)

Whatmore's world then 'is decidedly not one where pure forms are "mixed"; it is one of ongoing differentiation. In her worlds things are, and always have been, "impure"' (Braun 2005a, 836; see also Demeritt 2005).

As Braun argues, that 'humans, animals and machines no longer can be seen to have an existence independent from the relations that constitute them' (2005a, 836) is now a position widely held in geography. On the other hand, as Castree (2004) pointed out, this is at odds with many common sense understandings, which themselves need critical analysis. Thus geographers have explored how, following Latour, continuing attempts to purify and separate nature and culture actually proliferate the hybrids. For example, Robbins (2001) showed that Indian attempts to physically partition land uses encouraged the proliferation of 'impure' land covers, and Murdoch and Lowe (2003) discussed how the preservation of the English countryside encourages more people to move there, thereby reducing the amenity of the 'nature' they are pursuing.

Cities as places of nature

The increasing interest in urban nature within the human sciences is now well established (Whatmore and Hinchliffe 2003; Braun 2005b). Methods in the ethnographic tradition have been important in highlighting the non-human presence in cities (Hinchliffe *et al.* 2005). Foci include human–animal relations (e.g. Griffiths *et al.* 2000; Philo and Wilbert 2000; Wolch 2002) as well as human–plant ones (e.g. Jones and Cloke 2002), although most authors acknowledge that 'the "non" of nonhuman is far from being a straightforward boundary marker' (Hinchliffe *et al.* 2005, 643). Different groups within the city have been shown to have attitudes and practices *vis-à-vis* animals that can be related to the particulars of their own cultural experience (Wolch *et al.* 2000). Detailed focus on nature–culture hybrids such as zoos (Anderson 1995) and agricultural shows (Anderson 2003) has challenged the way the

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human itself is conceptualized as a unified and separate category. The material enmeshments between human and non-human worlds extend far beyond the space of the city, as demonstrated by Cronon (1991), Gandy (2002) and Kaika (2005).

A related shift is also occurring within the natural sciences, partly due to the pragmatic realization that the world is becoming more rather than less urbanized. New journals such as *Urban Ecosystems* are taking up the challenge, acknowledging that

> From a scientific perspective, urban and suburban landscapes have been understudied and underutilized by ecologists throughout the world. The reasons for this are many, but the primary underlying cause can be attributed to the reluctance of ecologists to work in areas dominated by humans. (McDonnell 1997, 85)

McDonnell's point is reflected in the resilience of the separationist paradigm within mainstream conservation biology journals, where there continues to be a focus on relatively 'intact' habitats (Fazey *et al*. 2005), with few studies 'conducted entirely in areas under intense human pressure (agricultural landscapes, coastal and urban areas)' (Fazey *et al*. 2005, 70). A number of writers have been forced to recognize the positive potential of urban ecosystems for biodiversity conservation, as seen for example in the high levels of species diversity they harbour due to the richness and diversity of habitats (Niemela 1999). In the growing field of urban ecology (Pickett *et al*. 2001 2004) there is emerging recognition that the cooption of human actors is likely to be crucial to biodiversity conservation (Savard *et al*. 2000; Rudd *et al*. 2002).

Indigeneity and belonging

In settler contexts such as Australia, North America and New Zealand, the construction of the city as a place of civilization in a world of savagery displaced not only plants and animals but indigenous people, who were considered to belong, if at all, in remote areas (Anderson 2000; Blomley 2004). Settler Australians' sense of their own belonging is thus intertwined in ambiguous and contradictory ways with a variety of attitudes and practices to the sorts of plants and animals that belong (Trigger 2003; Trigger and Mulcock 2005; Lien 2005). Related questions have been explored in New Zealand (Dominy 2001; Leach 2002), Canada (Mosquin 1997) and South Africa (Comaroff and Comaroff 2000). The role of landscape myth in the creation of white Australia's sense of national identity has been discussed at great length, and a dominant theme has been that of alienation; of the bush, outback and desert being hostile to white settlement, indeed inimical to culture itself. This understanding of history also created a strong temporal dualism – before and after 1788 – thus deep time belonged to nature, and historical time belonged to culture (Table I). Architect and critic Robin Boyd drew a direct connection between the environmental alienation of the frontier mentality and Australian suburbia. In dubbing it 'arboriaphobiaville', he described postwar suburban expansion as 'the second period of pioneering' (Boyd 1963, 91). 'The object of the pioneer cult, in short, is to clear all decks for action, to reduce everything to the same comprehensible level so that something new can be put on it' (p. 92).

Indigenous claims to land and rights over the last few decades have destabilized both settler understandings of their own belonging, and environmental management based on a separation between nature and culture. However, Aboriginal people themselves do not express an exclusively nativist view on questions of plant and animal belonging. Trigger (in prep.) has documented a 'multi-dimensional set of Aboriginal responses' that indicate considerable intellectual flexibility in dealing with changing ecological and socioeconomic conditions.

Despite the challenges provided by the indigenous presence, and some advances such as joint management of National Parks, the colonial heritage continues to be deeply embedded in much environmental thinking and management in Australia and elsewhere (Willems-Braun 1997; Neumann 1998; Zimmerer and Young 1998; Head 2000; Howitt 2001). Its diverse expressions, influenced also by the structure of scientific disciplines, include not only the establishment of protected areas that exclude people, but also the division of natural and cultural heritage within government instrumentalities. In the Australian context, such thinking continues to position 'the environment' outside of cities (McManus 2005), leading to a focus on 'green' rather than 'brown' environmental issues.

Gardens as culture/nature hybrids

Contemporary suburban gardens are nested within the multiple hybridities of suburbia. These include not only the central tension between country and city, but the gendered and classed distinctions between inside and outside, private and public space (Bunce 1994, 153–4). Even as Franklin was writing that 'one of the most staggering nature–

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human interfaces, gardening, has been ignored almost completely' (2002, 5), the ground was shifting. Gardens are commanding increasing research attention in both human (Hitchings 2003; Robbins and Sharp 2003; Bhatti and Church 2004; Power 2005) and natural (Rudd *et al*. 2002; Zagorski *et al*. 2004; French *et al*. 2005) sciences as part of moves to better understand urban natures, discussed above.

So what do the new hybrid geographies (e.g. Whatmore 2002) have to offer this already hybrid space? Most importantly, they resist the conception of 'every hybrid as a mixture of two pure forms' (Latour 1993 in Whatmore 2002, 2), and explore difference as relational rather than static. That is differences, for example between nature and culture, are not preexisting entities but take particular forms in varying contexts. Second, these relations of difference operate in webs or networks of connectivity and multiple agency (Philo and Wilbert 2000). Non-humans such as pets are powerful co-shapers of domestic environments and wider social structures (Haraway 2003). Weeds, birds, water and the power of the place itself interact with human activities. Recognition of non-human agency is an important counter to the notion of gardens as predominantly cultural constructions (Hitchings 2003; Power 2005). Nevertheless, there are ongoing methodological dilemmas in the fact that the means of articulating the liveliness and agency of the non-humans is (inescapably?) through a human lens. Philo (2005, 830), for example, pondered how an ethnography of elephant agency might be operationalized.

Third, an important means by which the new hybrid geographies rework the nature–culture divide is the emphasis on everyday knowledge and practice (Whatmore 2002). Everyday knowledge and practice are perhaps best put together in the notion of *dwelling*, as developed for example by Cloke and Jones (2001) from the thinking of Heidegger, and Ingold (2000). 'Dwelling is thus *potentially* bound up with ideas of home, local, and concern or affection for nature and the environment' (Cloke and Jones 2001, 651). This idea of dwelling, which 'helps to account for the intimate, rich, intense, making of the world' (2001, 652), is very appropriate for thinking about the everyday knowledges and practices within suburban backyard gardens. This is also well illustrated by considering popular writing about gardens, in which tales of engagement both against recalcitrant and with obedient or passionate non-human actants (weeds, lawn, roses, pets, pests etc.) are legion (e.g. Pollan 1991 2001). In such contexts the question then becomes refocused from the how and why of hybridity to the how and why of purification and boundary-making.

This study thus contributes to the repositioning of both environmental issues within urban and suburban contexts, and humans as enmeshed with rather than outside non-human nature. It uses backyard gardens as a lens through which to analyse urban, predominantly settler, Australian relations to nature. We use the term 'backyard garden' here to encompass both the physically enclosed, private domestic space connoted by 'backyard', and a focus on human relations to plants implied by 'garden'. It is to this analysis that we now turn.

Methods and study area

We draw on a study of 265 backyards in Sydney, Wollongong (a city of about 300,000 people, 85 kilometres south of Sydney on the Pacific coast) and Alice Springs (a central Australian desert town of 26,000 people) (Figure 1). Our sampling strategy was designed to encompass the socioeconomic and ecological variability in each of these main study areas. We also targeted particular groups such as migrant vegetable gardeners, bushcare volunteers and garden clubs. The period of fieldwork, 2002–3, corresponded to a time of significant drought in southeastern Australia. In keeping with the aim of analysing a variety of engagements between humans and non-humans, multiple methods were employed. Each backyard was visited and a semi-structured interview undertaken on site with the participant by one of a team of three researchers, including the two authors. The backyard was mapped and photographed, and checklists on the demography of the household, the structures in the backyard and the biogeography were completed. The interviews were transcribed and imported into the qualitative data analysis program, N6. Each interview was read through and indexed at nodes generated by the text. New nodes were created as new ideas emerged and coding at multiple nodes became established practice where content, context and emerging theory overlapped. Pseudonyms are used throughout this paper.

Overview of results

The total body of evidence illustrates considerable diversity in both the conceptual and material

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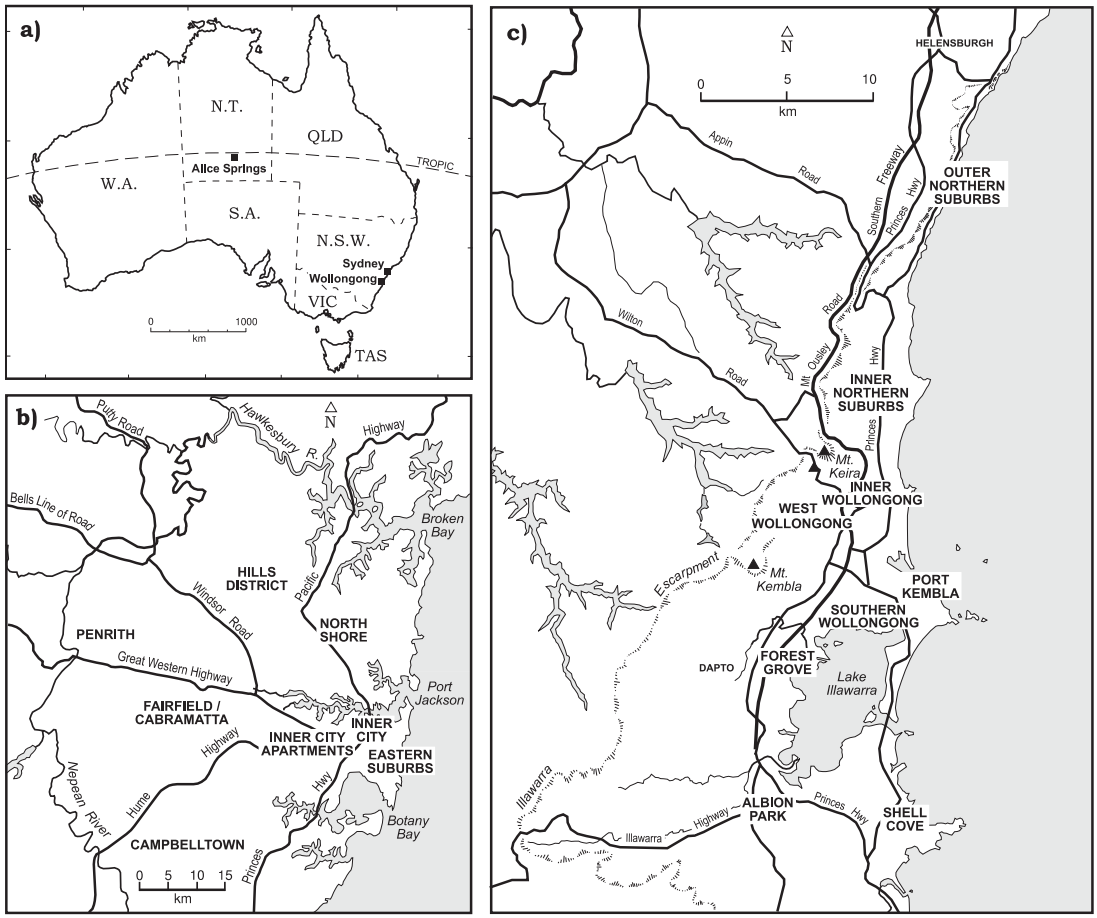

Figure 1 Map of study area

boundaries that suburban backyarders structure around spaces and species, and also the ways in which, after Williams (1982), 'a boundary is to cross'. As many of the authors cited above have argued, the processes of conceptual boundary-making have material consequences. According to how we have conceptualized something called nature, we might want to put a fence around it, create a bureaucracy to look after it, kill it, eat it, plant it, or remove it. The dividing line is drawn in many different places under a variety of influences: between inside and outside spaces, between domesticated environments and restored bushland ones, between trees and the suburbs, between native and non-native species, between exotics that sit quietly and ones that behave badly, between neighbours who kill good trees and neighbours who kill bad trees. The question of belonging is thus highly contingent; trees, cats, native plants, dogs, birds, weeds are situated in various ways, and in relation to each other. We focus here on two themes: the process of spatial boundary-making, both within the backyard and with respect to the outside; and the question of nativeness and belonging, as applied particularly to plants.

At the broadest scale, the native/exotic distinction is that between Australian plants and those introduced from elsewhere, but the categories conflate considerable ecological and social complexity. Our overall research findings concur with previous Australian studies showing that the most popular garden types include exotic plant species, either alone or in combination with natives (National Parks and Wildlife Service NSW 2002; Zagorski *et al*.

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2004; Trigger and Mulcock 2005). In order to interrogate issues to do with nativeness and belonging in greater depth, we grouped our total sample as follows, based on attitudes expressed in their interviews: committed native gardeners (CNG) (n = 34), general native gardeners (GNG) who chose to plant both natives and exotics (n = 62), and non-native gardeners (NNG) who chose not to plant natives but who may have inherited some when they moved to their current address (n = 136) (Table II). Another group defined as non-gardeners were either self-described or not involved in the backyard (n = 33). The construction of the groups on the basis of attitudes expressed also has biogeographical validity. Fifty-three per cent of CNGs had 80–100 per cent of their shrub and tree layer under native plants, which were also likely to include a higher proportion of plants indigenous to the local area. In the GNG and NNG groups 'native' plants usually comprised *Eucalyptus* trees and/or hybrid cultivars such as *Grevillea* spp. These groupings encompass a diversity of socioeconomic, age and gender variables. The main manifestation of class is that the CNG group are collectively higher in education and skills. CNGs are overrepresented in our sample relative to the general population as they were one of several special interest groups targeted in our sampling. Like all boundaries discussed in this paper, those between the groups are permeable and often transgressed.

The purification of space

Zonation within backyards

Sociospatial analysis of contemporary Australian house and garden configurations shows two broad trends (Dovey 1994). The first is zonation of backyard spaces to separate utilitarian functions (e.g. clothes drying, rubbish bins) from recreational ones (outdoor eating and entertaining areas, swimming pools). The latter areas are often now depicted and delineated as 'outdoor rooms'. The second trend is greater integration between informal living areas at the back of the house and the outdoors. This trend to 'bringing the outside in' is accomplished both physically (e.g. large sliding doors) and visually (extensive use of glass). That boundaries between inside and outside the house are being blurred is a very consistent trend within our data. For example 65 per cent of backyards studied had an outdoor dining setting (although the ornateness of these varied considerably) and 87 per cent a defined recreational/entertaining area adjacent or attached to the back of the house. Most study participants have created some type of house/garden ecotone to connect their living space to the outdoors, but beyond that the processes of boundary-making are much more variable. The blurring of inside/outside boundaries contrasts with a study in Japan, where the inside of the house is associated strongly with cleanliness and safety, and the outside with dirt and danger (Ozaki and Lewis 2006).

Zonation of areas within the backyard is evident in both small (Figure 2) and large (Figure 3) backyards. Bella's small new backyard shows a typical pattern of separated recreation, work and display areas. There is a strong connection between the house and the recreation area (Figure 2b) and closed external boundaries to enhance the privacy of the small but actively used backyard. In the front garden, which is much less actively used, there is no fence, and a more open boundary to the street. Celeste and Martin's much larger and older backyard also shows strong internal boundaries, with an intensively used and fenced family living and play area closest to the house (Figure 3a). Towards the back of the block the boundaries become more porous as there is a gradual blending with the forest to the rear (Figure 3b). The open boundary in the northeast corner reflects not only the lack of a physical fence, but strong positive interactions with neighbours on that side.

Boundedness with outside space

A number of participant backyards back on to reserves or bushland (n = 38, 14 per cent[4]). The variability within this subsample provides another means of analysing spatial partitioning. As might be expected, CNGs are more likely to have open (i.e. unfenced or physically or visually permeable) boundaries to adjacent bushland, and to discuss their planting strategies in terms of bringing nature in to the domestic environment (Table II).

More complex boundary-making is evidenced by GNGs, who tend towards a more emphatic separation of what they see as domestic and natural spaces, even when involved in restoration activities in the bush adjacent to their backyards. For example, Juliette has a fence which separates the more domestic part of her backyard from the bush. On the inside are grass, vegetables, garden beds and homes for her extensive menagerie of pets. On the 'outside' of the fence, but still on Juliette's land, is an area

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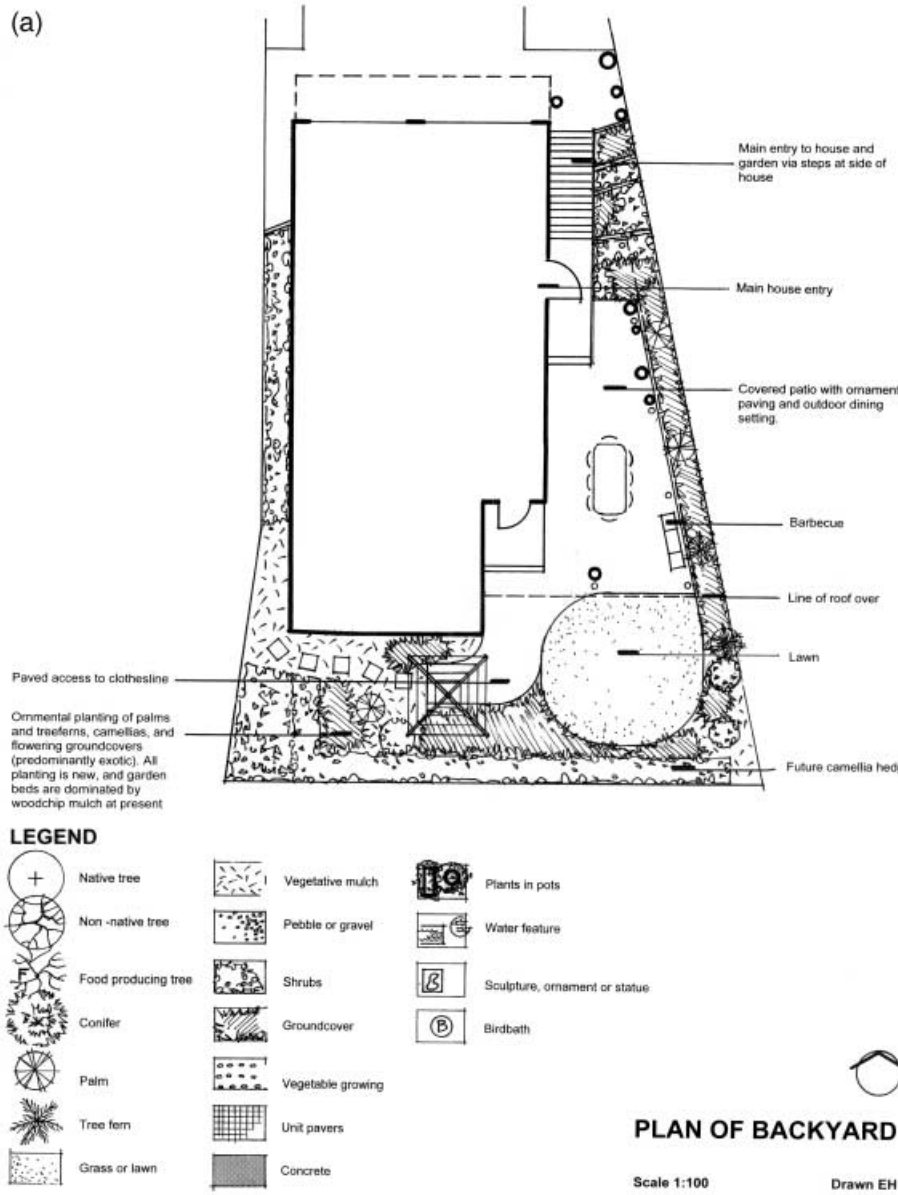

Figure 2 Bella, Forest Grove (a) plan of backyard; (b) socio-spatial analysis

that she is regenerating, extending down to the creek.

> The inside of the backyard I've got a mixture . . . but on the other side of the fence everything that I plant out there is like local and what belongs there. There's actually three old camellia trees out there that are quite big which I'm going to have to cut down because they just don't belong there. (Juliette, GNG)

Juliette would have no qualms about leaving the exotic camellias if they were a few metres away, inside the fence.

Carrie, who lives on the outskirts of Alice Springs, has an extremely manicured backyard including lawn and rose beds, bordered by an open mesh fence that backs on to apparently pristine bush extending up to the range behind the line of houses

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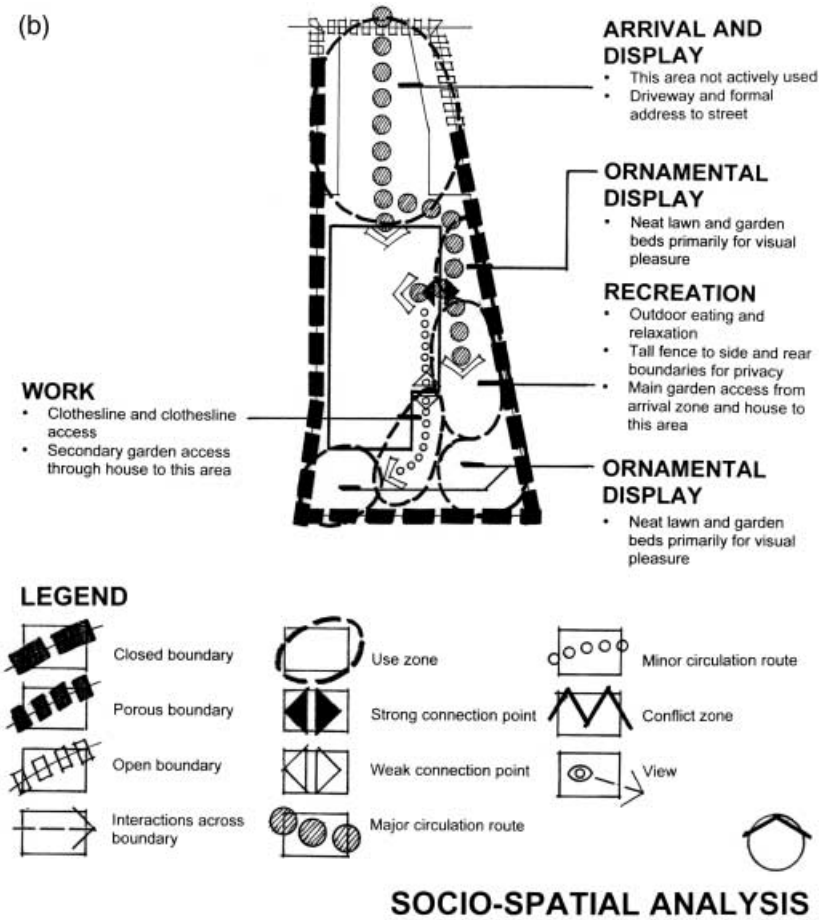

Figure 2 Continued

(Plate 1). Although there is a striking contrast between inside and outside, Carrie (a GNG) sees it as more of a continuum, enhanced by the fact that she can see through the fence: 'we like to think of our backyard as being an extended backyard in that it goes into the bushland and up to the range'. The fence marks the legal boundary, and is there to keep the kids and dog in and larger bush animals out, but is transgressed when for example bearded dragons come in through the fence and are attacked by the dog. A pond that they maintain outside the fence provides water for kangaroos and euros (a small species of kangaroo) that the family enjoy catching glimpses of. Like Juliette, Carrie is active in weed removal beyond the fence, seeing different types of nature as belonging in different places.

In grazing his rabbits and growing vegetables in the adjacent nature reserve (Plate 2), Lorenzo exemplifies the extension of domestic environments onto reserve lands common among NNGs (Table II). However, the outcome in terms of protection of an endangered species is in this case just as favourable as reserves adjacent to CNG or GNG backyarders, albeit they are each doing it with somewhat different rationales.

Purification of species: native plants and the question of belonging

Narratives of redemption are expressed frequently by CNGs, who often describe themselves as purists. Joanne, for example, contrasts the purity of nature with the impurities of culture.

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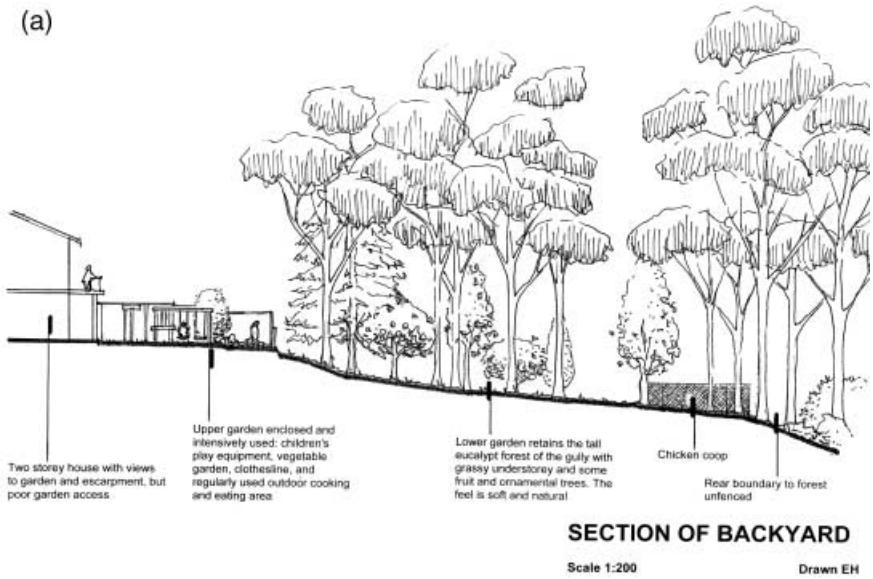

Figure 3 Celeste and Martin, Austinmer (a) section of backyard; (b) socio-spatial analysis

Table II Summary comparison of attitude and practice, gardener groupings

	Committed native gardeners (CNG)	*General native gardeners (GNG)*	*Non-native gardeners (NNG)*
N[a]	34	62	136
% total sample	13	23	51
Most frequent % native in backyard shrub and tree layer[b]	81–100	41–60	<20
Favoured in own plantings	Local native	General native, e.g. hybrid cultivars like *Grevillea*	Non-native
3 main reasons for planting or not planting native[c]	1. Belonging; 2. Aesthetics; 3. Time	1. Aesthetics; 2. Birds; 3. Climate	1. Aesthetics (incl. negative); 2. Birds; 3. Climate/Time
Nature of boundaries to adjacent bushland[d]	Open, i.e. unfenced or permeable	Open	Gated or closed, i.e. impermeable fence
Boundedness[e]	Bringing nature into backyard	Separation of domestic and natural spaces	Extension of domestic

See text for further details. [a]Excludes 33 (12%) participants who identify as non-gardeners. [b]Recorded in 20% units. [c]Subsample of each group, based on interview data. [d]Main physical boundary type, subsample of total study who live adjacent to bushland (n = 38, 14%). [e]Dominant practices and attitudes expressing relationship between backyard and adjacent bushland, subsample of total study who live adjacent to bushland (n = 38, 14%)

> I love the Australian bush. I've been a bush walker all my life. I like walking in it and although I have grave doubts about Australian society, the bush itself to me is pure. (Joanne, CNG)

For Margot, a purist approach has developed over time as she gradually became more familiar with the environment she was living in and the bush adjacent to her backyard.

> Yes, I've decided to become really pure. I wasn't quite so purist at the beginning and I'd be tempted to have a little exotic here and there but as time has gone on, I have really appreciated how the native garden looks and how I feel about it, I've decided that I'm going to be purist and if anything foreign comes up, I'll take it. (Margot, CNG)

CNGs are usually strongly ecologically informed,[5] and are most likely to discuss natives in terms of

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(b)

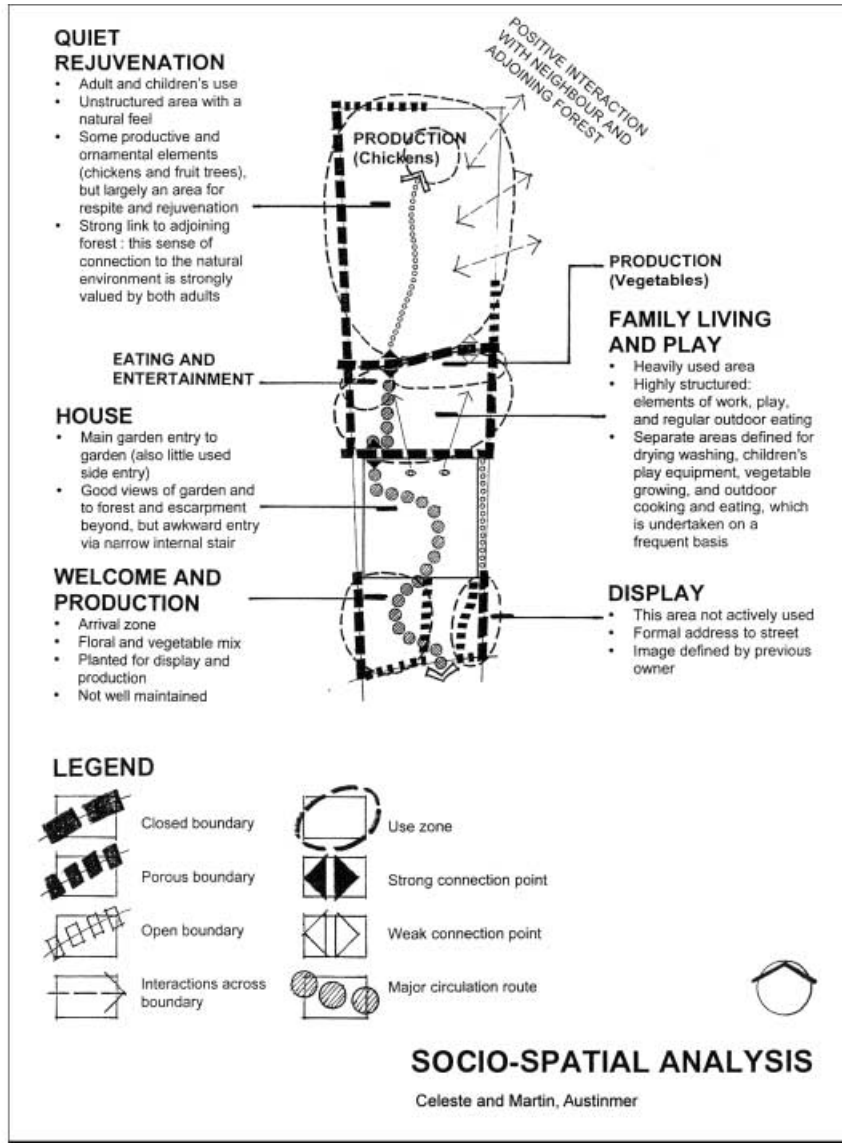

Figure 3 Continued

localness, i.e. they emphasize the importance of being 'native to this area' rather than just native to Australia. Many either work as environmental professionals or are involved in volunteer bush regeneration or native plant special interest groups, i.e. they express what we traditionally understand as a conservationist mindset. These people are more likely to propagate their own plants from local seed, seek out specialist suppliers and/or facilitate the process of self-seeding of local plants. Conversely, they tend to express disparaging attitudes towards 'exotic' or 'foreign' plants, as in Margot's quote above, and to neighbours who enjoy them. This is reinforced when we compare participants' reasons for planting or choosing not to plant natives (Table II). Among CNGs the most common reason given for planting natives was related to what 'belonged' in that specific environment.

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Plate 1 Carrie's backyard, Alice Springs, looking out through fence

At the other extreme are some NNGs who actively dislike native plants, often seeing them as 'straggly' or 'scraggy'. Others distinguish between what is desirable in their backyards and out in the bush. Anita (NNG) apologized for her dislike of natives, saying, 'bush to me should be bush and . . . you know, if you want to plant a hibiscus, put it in your backyard'.

> I love going out in the bush, and going and looking at wildflowers and things like that. But I just felt what I wanted out here was a nice, very flower garden, more like your cottage type garden and the natives just didn't do that for me. (Monica, NNG)

> There's a lot of native plants I don't like . . . I don't find them attractive and I didn't like them when we grew them on our farm. My husband liked them . . . and I probably always liked exotics. But I also loved the bush; I love the bush and I've spent time in the bush, you know and I could spend a week walking in the bush. So it's not because I don't love the bush. (Christine, NNG)

Anita's apology (above), and comments such as 'I don't like natives; probably that's a sin to say that but that's just how I feel personally', alert us to the moral terrain of nativeness and indigeneity. The question of nativeness both induces and assuages

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Plate 2 Lorenzo and his rabbit hutches in *E. maculata* reserve

guilt. Guilt was also expressed by the participant who said, 'It's probably the worst thing I could say is, I'm not a big fan of natives.' For GNG Michael the nativeness of his lily pilly hedge assuaged his guilt at how much it cost; 'when we spent hundreds of dollars buying the lily pillies we were pleased that they were natives'.

The emphatic delineation of species belonging expressed most clearly by CNGs has material consequences for non-humans considered not to belong, including exotics, lawn and/or weeds. Kris, who we met in the introduction, explained her rationale for restoring native vegetation by elaborating on her feelings about lawn:

> this was lawn, the whole thing was lawn, and I've just ripped it up . . . I just find that [lawns] look ugly, and I just find them environmentally reprehensible basically. I can understand how people with small kids have lawns, but . . . it's not what I'm about with my garden. My garden to me is an eco system and a lawn is an anti eco system. (Kris, Mangerton, CNG)

The actual labour of this type of species purification is a long and difficult process that can itself change people's understanding of how appropriate it is. In such engagements the non-humans have considerable agency. For example, a key tension that participants encounter in removing the invasive alien *Lantana camara* (lantana) is that its dense thickets provide valued habitat for many small native birds whose traditional habitat has been decimated by land clearing. This dilemma is particularly felt by CNGs such as Donald, who described work over several years to remove a variety of weeds from his backyard in an attempt to restore locally native species.

> I feel pretty passionate about not having exotics. But I'm beginning to realize it's a bit more complicated than that now, that lantana isn't necessarily totally bad because it's bird habitat. (Donald, CNG)

Donald is typical of CNGs in having a fixed taxonomy of belonging that is in tension with his practice. In contrast, GNG Jane explains her planting decisions in terms of the behavioural qualities of plants, an attitude that has been developed over a long period of observation and engagement.

> I think with exotics versus natives, if you live near the bush like we do, then I've proved to myself that you must be careful what exotics you plant near it, because some do invade and some don't . . . I've become more knowledgeable about those that I can plant safely without having them invade the bush. (Jane, GNG)

For Jane there is a strong distinction between good and bad exotic plants, separate to their non-native

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status. The bad ones (including *Anredera cordifolia* (Madeira vine) and *Lantana*) are invasive in the bush, while those that sit quietly in the domestic space of her garden (specimen conifers, port wine magnolia, daffodils) are very welcome despite being exotic.

Non-gardeners were more likely to view nature or the natural environment as something 'out there' and distanced from their own backyard. This was particularly evident in relation to trees, non-humans whose size seems to intensify human passions, whether towards love and respect, or hatred, danger and risk. The size of eucalypts in particular is often generalized to exclude their belonging from backyards, an attitude encapsulated by Lindsay: 'I don't think gum trees have a place in suburban backyards somehow'. For those who consider large trees out of place in the suburbs, the reasons are congruent with the metaphor of dirt; messiness and disorder are constantly referred to. Even people who loved trees were concerned about the mess created by the constant shedding of leaves and bark. For example, Sabrina was able to enjoy the trees in other people's gardens because she did not have responsibility for cleaning up the mess. 'Everybody else has got the gum trees, I love the gum trees but I don't like the mess, so everybody else has got them.'

People often qualified their negative comments with an apology, and a profession of passion for trees in the right place. For example, Liza from Kellyville (a new suburb on the northwest fringe of Sydney) has a small backyard that is completely paved, with no trees (Plate 3). She talked about her husband's attitudes to tree clearing.

> my husband loves to bushwalk and that, so he loves nature and he loves trees. He would be a country boy if he could, . . . he hates, he actually even hates that people cut down, even though they are specifically grown . . . Christmas trees; he just hates that. (Liza, non-gardener)

Liza regarded nature as trees and open spaces, but expressed hesitation as to whether people were part of nature. For her, trees are grown so that 'we can have forests' in an environment that is visited, rather than the backyard. Similarly, a resident of Albion Park, an area of rapid urban expansion on the edge of Wollongong's forested escarpment, articulated this separation when asked to compare her attitude towards her backyard with other areas such as national parks.

> I sort of appreciate our national parks and the need for trees and things like that. But if you look around we don't have any trees in our backyard. Barry won't have a tree. I would have one, but he feels threatened by trees falling on us . . . When I was a child I got a lot of good feelings out of national parks and picnic areas and that. But to be honest, I get a better feeling in my own backyard now; you know, I can sit out on that grass and feel like I'm in a national park. I have my own space there, so I'm fine with it. (Nicky, Albion Park, non-gardener)

These attitudes that trees belong 'somewhere else' was expressed most frequently in newer housing estates where large houses take up most of the block.

Comparisons – resilience and rupture

On the face of things Nicky, who was happy to leave nature 'out there', and those participants who think 'the bush' is the place for native plants, preferring lawn and exotics in their own gardens, have reinforced the modernist divide between country/nature and city/society. In extending his vegetable gardening into the adjacent nature reserve, Lorenzo is projecting a European ethic onto it, rather than coming to terms with the essence of Australian nature. In this view CNGs such as Margot, Donald and Kris have ruptured the divide by facilitating and enhancing biodiversity conservation in their backyards, i.e. by bringing nature into the city. The evidence however requires a more nuanced approach.

Although welcoming native biodiversity back into the city, the conservationist position, as exemplified by our committed native gardeners, has transferred other aspects of separationist environmental thinking into the urban context with little modification. (Albeit their practices are as hybrid as any other, since this view of nature requires exceptions to be made for dogs, cats and human selves.) A clear divide between humans and nature is reinscribed in the way the human self is exempted from the category of invasive alien. A strong social separation is also seen when attempts at species purification intensify social boundaries with neighbours. Participants who were strongly committed to restoring native trees indigenous to their area were often highly critical and in some cases intolerant of the choices made by neighbours.

> When we moved in there were quite a few young camphor laurels[6] in the front and she [the previous owner] said to us 'look after our trees' and as soon as she left we cut them down. People don't realise what

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Plate 3 Liza with children in their paved backyard

> they've got, they think if its green it's okay . . . As far as getting everyone to see the merits of native plants, indigenous plants, that's not really feasible. It's hard just to get them to cut down a weed. If they think it's pretty then they don't really care about the damage it causes to the native bush. (Miranda, CNG)

That the moral battleground became physical was not an isolated case; a number of CNG participants admitted to killing neighbours' trees they considered weeds. After expounding at length on what he described as his 'bloody minded' passion against his neighbours' exotic plants and cats, one committed native gardener laughed, 'You can see I'm not a very good neighbour, you won't want to live next to me now.'

Thus, in denying or eliding the human and the social 'in here', many CNGs are just as separatist as Nicky in framing distinct realms for humans and nature. This is a classic example of what Mosquin refers to as the paradox of human exemption, whereby 'definitions [of invasive aliens] exclude humans from recognition as alien species regardless of biological, geographical or historical facts' (Mosquin 1997, 3). Perhaps the most profound contradiction of the narratives of purity is that, although they are articulated in ways that exclude

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people, or in which people are invisible, any attempt to maintain or foster the dominance of locally indigenous species in a backyard requires an enormous amount of human effort, at least as much as maintaining a weed free and luxuriant lawn. It is not labour which can be invested just once, but must be ongoing if it is to be successful.

Different types of separation are expressed by those, mostly general and non-native gardeners, who continue to position most of the non-human world as belonging outside the city, or by those such as Carrie and Juliette whose backyard zonations increase the proportions of 'native nature' with distance from the house. We have suggested that, at both ends of the nativist spectrum the dualisms are exacerbated by settler anxieties about their own belonging. This is seen in both the redemptionist narrative of native purism and the guilt acknowledged by those who dislike native plants. In all these situations nature has an agency of its own, providing a variety of invaders that spread both by seed and vegetative means. These include both native and non-native species that combine in new ways, with a range of unexpected ecological consequences, referred to by ecologists as 'new nature' (Low 2002) or 'novel ecosystems' (Hobbs *et al.* 2006). The majority of urban Australians who express preferences for exotic and native species in combination are in tune with this new hybrid reality.

In fact the purists recognize that the purity to which they aspire is ruptured not only by changed ecological thresholds, but by other dimensions of their own lives, including houses, dogs, cats, vegetable gardens and their own presence. They know that none of their gardens can be understood as pure in the terms that the narrative demands. They contain the impure plantings of previous owners, and are juxtaposed against the backyards of neighbours with very different ideas and practices. Our participants deal with these paradoxes in various ways. Thus Donald tolerates a large camphor laurel because it is his children's swing tree. Kris really loves her cat. 'I think they should be phased out of the country, but I do love them . . . I'm very compromised with my cat in that respect.' One CNG couple named their dog *Poa*, after the grass genus containing a number of Australian native species, in a presumably subconscious attempt to naturalize his presence in their landscape.

We suggest here that the ideal of purity is so resilient because the (post)colonial Australian context provides another dualism to line up with the nature/society, country/city and wild/domestic divides observed by other scholars – indigenous/non-indigenous. That is, in advocating a particular set of plant choices on the grounds of 'belonging', but excluding themselves from the same provisos, the CNGs are expressing the tensions and ambivalences that accompany questions of their own belonging to the land. This generally well-educated group is also strongly influenced by scientific ecology which has traditionally maintained a strong separation of humans and nature. However, the tensions are not confined to CNGs, as voiced by permaculturist Duncan in the following quote.

> I guess the other angle is that you know ultimately we're probably not meant to be here either in terms of, you know, white Anglo-Saxon human beings. And then everything we eat, well ninety-nine per cent of the things we eat aren't native to Australia either. (Duncan, NNG)

In contrast, the rupture is most strongly articulated (or, following Robbins 2001, the hybrids are given voice) in the context of dwelling, 'the intimate, rich, intense, making of the world' (Cloke and Jones 2001, 652) developed by labour, engagement and close observation. Thus Donald leaves the lantana, or at least removes it more slowly, as it provides bird habitat, and Jane distinguishes between good and bad exotics based on her observations of which ones behave themselves in the bush. Nor is it only people who would identify as conservationist who have this experience. Many of that majority of participants whose gardens combine native and non-native plants describe enjoying observations of birds that have become part of their daily routine, and that now provide strong incentives for them to expand native plantings (Table II). Thus native plants ingratiate themselves into places of importance in the daily lives of GNGs and NNGs via birds.

We do not read the concern with order and tidiness as a straightforward expression of a settler Australian desire to dominate and distance themselves from 'nature'. Although that is certainly there for some participants, a more widespread motive is to put order into human lives. Tidiness is valued for a complex set of reasons that include social respectability, a certain moral quality, and the stress occasioned by mess, the latter expressed with some weariness by the working mother who said of her backyard, as if of another child, 'I resented the mess and the constant need'.

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There is a clear connection in this study between the diverse everyday engagements in a more than human world (struggling with weeds, developing practical knowledge of how exotic and native species behave, enjoying birds) and the rupture of more separationist views of nature. It is important to emphasize that the garden is not coincidental in these transformations. It should not be understood as a separate field site where we can view the expression of pre-constituted attitudes and practices. Rather it is a place – like any other – of active making and re-making, of both humans and non-humans.

Conclusions

The examples presented here show how some attitudes and practices have destabilized or broken down the dualisms between nature and society, while others have reinforced them. Reinforcements include the various means of tidying nature up, and the associated anxiety created by states of disorder; and the view that real Australian nature is native, defined by those organisms that were here before 1788. Rupture includes the diverse practices by which nature is welcomed into the city (the 'bringing the bush back in' of the committed native gardeners, and the widespread welcoming of birds). Locally indigenous planting practices make important contributions to the conservation of native biodiversity in urban areas. Yet the social viability and resilience of such purification, as seen in strong social bounding against neighbours, is likely hampering its uptake and spread. Islands of biogeographic purity in the suburbs are unlikely to be able to survive in a sea of hostility any more than they could survive genetic isolation. The social dimensions of these networks need as much attention as the biological ones. On the other hand, a significant minority actively dislikes native plants in the domestic context, and will probably continue to resist attempts to educate them otherwise. The widespread preference for exotic garden plants – either alone or in combination with natives – is just one example that indicates a level of comfort with and attachment to an Australian ecology that has changed radically since 1788. There is potential here for engagement with the 'new natures' of increasing interest to ecologists. The same attitudes however can reinforce old dualisms when they see the hybrids as simply part of the cultured environments of the city, and continue to position a pure nature as existing somewhere else, 'outside', 'in the bush'.

The insights provided by an ethnographic emphasis on everyday practice have implications for the complex questions of urban sustainability that may differ from a top-down planning approach. For example, arguments for urban consolidation routinely invoke the environmental advantages of its reduced urban footprint by comparison with urban sprawl, in which the gardens of suburbia are seen as problematic. Yet if in the process the flawed 'social' is quarantined further from nature 'out there', the implications for reduced human engagement and empathy with plant and animal others will be considerable. Across the spectrum of attitude and practice, separation and purification are most disrupted in everyday situations of close interaction with and observation of the non-human world, when backyarders engage with the agency of weeds, birds, water and self-seeded shrubs, among others. Our argument is not intended to essentialize the garden as an environmental good, but to focus on the types of relationships and engagements that are possible in such a context. In this, as in other environmental debates, we need to continue to find ways to go beyond dualisms, while continuing to analyse why they remain so resilient and appealing.

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Notes

1 Pseudonyms are used throughout this paper.
2 A vernacular Australian term for chicken.
3 The purity or otherwise of the category 'species' is also of course an issue within the biological sciences (see for example Hey 2006).
4 Due to the dissected sandstone topography of Sydney and Wollongong, stream reserves and bushland fragments are not just on the urban margins but penetrate very close to the city centres.
5 It is important to emphasize that the question of nativeness is a highly contingent one within ecology. We have argued elsewhere that the conceptualization of 'alien invasives' conflates two axes of variability that have become unhelpfully blurred (Head and Muir 2004).
6 *Cinnamomum camphora*, one of the top environmental weeds in southeastern Australia.

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References

Allon F and Sofoulis Z 2006 Everyday water: cultures in transition *Australian Geographer* 3745–55

Anderson K 1995 Culture and nature at the Adelaide Zoo: at the frontiers of 'human' geography *Transactions of the Institute of British Geographers NS* 20 275–94

Anderson K 2000 Savagery and urbanity: struggles over Aboriginal housing, Redfern, 1970–73 in **Read P** ed *Settlement. A history of Australian indigenous housing* Aboriginal Studies Press, Canberra 130–43

Anderson K 2003 White natures: Sydney's Royal Agricultural Show in post-humanist perspective *Transactions of the Institute of British Geographers NS* 28 422–41

Bhatti M and Church A 2004 Home, the culture of nature and meanings of gardens in late modernity *Housing Studies* 19 37–51

Blomley N 2004 *Unsettling the city. Urban land and the politics of property* Routledge, New York

Boyd R 1963 *The Australian ugliness* Penguin, Ringwood

Braun B 2005a Writing geographies of hope *Antipode* 37 834–41

Braun B 2005b Environmental issues: writing a more-than-human urban geography *Progress in Human Geography* 29 635–50

Bunce M 1994 *The countryside ideal. Anglo-American images of landscape* Routledge, London

Castree N 2004 Nature is dead! Long live nature! *Environment and Planning A* 36 191–4

Castree N 2005 *Nature* Routledge, London

Cloke P and Jones O 2001 Dwelling, place, and landscape: an orchard in Somerset *Environment and Planning A* 33 649–66

Comaroff J and Comaroff J L 2000 Naturing the nation: aliens, apocalypse, and the postcolonial state *Hagar International Social Science Review* 1 7–40

Commonwealth of Australia 2001 *Australia state of the environment 2001* Australian State of the Environment Committee, Canberra

Cresswell T 1997 Weeds, plagues, and bodily secretions: a geographical interpretation of metaphors of displacement *Annals, Association of American Geographers* 87 330–45

Cronon W 1991 *Nature's metropolis: Chicago and the great West* Norton, New York

Demeritt D 2005 Hybrid geographies, relational ontologies and situated knowledges *Antipode* 37 818–23

Dominy M 2001 *Calling the station home: place and identity in New Zealand's high country* Rowman & Littlefield, Lanham MD

Douglas M 1966 *Purity and danger* Routledge and Kegan Paul, London

Dovey K 1994 Dreams on display: suburban ideology in the model home in **Ferber S, Healy C and McAuliffe C** eds *Beasts of suburbia. Reinterpreting cultures in Australian suburbs* Melbourne University Press, Melbourne 127–47

Fazey I, Fischer J and Lindenmayer D B 2005 What do conservation biologists publish? *Biological Conservation* 124 63–73

Francis M and Hester R T Jr eds 1990 *The meaning of gardens. Idea, place and action* The MIT Press, Cambridge MA

Franklin A 2002 *Nature and social theory* Sage, London

French K, Major R and Hely K 2005 Use of native and exotic garden plants by suburban nectarivorous birds *Biological Conservation* 121 545–59

Gandy M 2002 *Concrete and clay. Reworking nature in New York City* The MIT Press, Cambridge MA

Griffiths H, Poulter I and Sibley D 2000 Feral cats in the city in **Philo C and Wilbert C** eds *Animal spaces, beastly places: new geographies of human–animal relations* Routledge, London 56–70

Haraway D 2003 *The companion species manifesto: dogs, people, and significant otherness* Prickly Paradigm Press, Chicago IL

Head L 2000 *Second nature. The history and implications of Australia as Aboriginal landscape* Syracuse University Press, Syracuse NY

Head L and Muir P 2004 Nativeness, invasiveness, and nation in Australian plants *The Geographical Review* 94 199–217

Hey J 2006 On the failure of modern species concepts *Trends in Ecology and Evolution* 21 447–50

Hinchliffe S, Kearnes M B, Degen M and Whatmore S 2005 Urban wild things: a cosmopolitical experiment *Environment and Planning D: Society and Space* 23 643–58

Hitchings R 2003 People, plants and performance: on actor network theory and the material pleasures of the private garden *Social and Cultural Geography* 4 99–112

Hobbs R J, Arico S, Aronson J, Baron J S, Bridgewater P B, Cramer V A, Epstein P R, Ewel J J, Klink C A, Lugo A E, Norton D, Ojima D, Richardson D M, Sanderson E W, Valldares F, Vila M, Zamora R and Zobel M 2006 Novel ecosystems: theoretical and management aspects of the new ecological world order *Global Ecology and Biogeography* 15 1–7

Howitt R 2001 Frontiers, borders, edges: liminal challenges to the hegemony of exclusion *Australian Geographical Studies* 39 233–45

Ingold T 2000 *The perception of the environment. Essays on livelihood, dwelling and skill* Routledge, London

Jones O and Cloke P 2002 *Tree cultures. The place of trees and trees in their place* Berg, Oxford

Kaika M 2005 *City of flows. Modernity, nature and the city* Routledge, London

Latour B 1993 *We have never been modern* Harvester Wheatsheaf, Brighton

Leach H 2002 Exotic natives and contrived wild gardens: the twentieth-century home garden in **Pawson E and Brooking T** eds *Environmental histories of New Zealand* Oxford University Press, Melbourne 214–32

Lien M E 2005 'King of fish' or 'feral peril': Tasmanian Atlantic salmon and the politics of belonging *Environment and Planning D: Society and Space* 23 659–71

Low T 2002 *The new nature* Viking, Melbourne

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McDonnell M J 1997 A paradigm shift *Urban Ecosystems* 1 85–6

McManus P 2005 *Vortex cities to sustainable cities. Australia's urban challenge* University of New South Wales Press, Sydney

Mosquin T 1997 *Management guidelines for invasive alien species in Canada's National Parks* Ottawa Report for National Parks Branch Parks, Canada

Murdoch J and Lowe P 2003 The preservationist paradox: modernism, environmentalism and the politics of spatial division *Transactions of the Institute of British Geographers NS* 28 318–32

National Parks and Wildlife Service NSW 2002 Urban wildlife renewal, growing conservation in urban communities NSW NPWS (http://www.nationalparks.nsw.gov.au/) Accessed 1 December 2003

Neumann RP 1998 *Imposing wilderness struggles over livelihood and nature preservation in Africa* University of California Press, Berkeley CA

Niemela J 1999 Ecology and urban planning *Biodiversity and Conservation* 8 119–31

Ozaki R and Lewis J R 2006 Boundaries and the meaning of social space: a study of Japanese house plans *Environment and Planning D: Society and Space* 24 91–104

Philo C 2005 Spacing lives and lively spaces: partial remarks on Sarah Whatmore's *Hybrid geographies Antipode* 37 824–33

Philo C and Wilbert C 2000 Animal spaces, beastly places: an introduction in **Philo C and Wilbert C** eds *Animal spaces, beastly places: new geographies of human–animal relations* Routledge, London 1–34

Pickett S T A, Cadenasso M L, Grove J M, Nilon C H, Pouyat R V, Zipperer W C and Costanza R 2001 Urban ecological systems: linking terrestrial ecological, physical, and socioeconomic components of metropolitan areas *Annual Review of Ecology and Systematics* 32 127–57

Pickett S T A, Cadenasso M L and Grove J M 2004 Resilient cities: meaning, models, and metaphor for integrating the ecological socio-economic, and planning realms *Landscape and Urban Planning* 69 369–84

Pollan M 1991 *Second nature. A gardener's education* Delta, New York

Pollan M 2001 *The botany of desire. A plant's-eye view of the world* Random House, New York

Power E R 2005 Human–nature relations in suburban gardens *The Australian Geographer* 36 39–53

Robbins P 2001 Tracking invasive land covers in India, or why our landscapes have never been modern *Annals of the Association of American Geographers* 91 637–59

Robbins P and Sharp J T 2003 Producing and consuming chemicals: the moral economy of the American lawn *Economic Geography* 79 425–51

Rudd H, Vala J and Schaefer V 2002 Importance of backyard habitat in a comprehensive biodiversity conservation strategy: a connectivity analysis of urban green spaces *Restoration Ecology* 10 368–75

Savard J-P L, Clergeau P and Mennechez G 2000 Biodiversity concepts and urban ecosystems *Landscape and Urban Planning* 48 131–42

Sibley D 1988 Survey 13: Purification of space *Environment and Planning D: Society and Space* 6 409–21

Sibley D 1995 *Geographies of exclusion. Society and difference in the West* Routledge, London

Sibley D 2001 The binary city *Urban Studies* 38 239–50

Trigger D 2003 Disputed territories: land, culture and identity in **Trigger D and Griffiths G** eds *Disputed territories. Land, culture and identity in settler societies* Hong Kong University Press, Hong Kong 1–28

Trigger D in prep Indigeneity, ferality and what 'belongs' in the Australian bush: aboriginal responses to 'introduced' animals and plants in a settler-descendant society

Trigger D and Mulcock J 2005 Native vs exotic: cultural discourses about flora, fauna and belonging in Australia in **Kungolos A, Brebbia C and Beriatos E** eds *Sustainable planning and development* Wessex Institute of Technology Press, Southampton The Sustainable World vol 6 1301–10

Whatmore S 2002 *Hybrid geographies. Natures, cultures, spaces* Sage, London

Whatmore S and Hinchliffe S 2003 Living cities: making space for urban nature *Soundings* 22 137–50

Willems-Braun B 1997 Buried epistemologies: the politics of nature in (post)colonial British Columbia *Annals of the Association of American Geographers* 87 3–31

Williams N M 1982 A boundary is to cross: observations on Yolngu boundaries and permission in **Williams N M and Hunn E S** eds *Resource managers: North American and Australian hunter-gatherers* Australian Institute of Aboriginal Studies, Canberra 131–54

Wilton R D 1998 The constitution of difference: space and psyche in landscapes of exclusion *Geoforum* 29 173–85

Wolch J 2002 Anima urbis *Progress in Human Geography* 26 721–42

Wolch J, Brownlow A and Lassiter U 2000 Constructing the animal worlds of inner-city Los Angeles in **Philo C and Wilbert C** eds *Animal spaces, beastly places: new geographies of human–animal relations* Routledge, London 71–97

Zagorski T, Kirkpatrick J B and Stratford E 2004 Gardens and the bush: gardeners' attitudes, garden types and invasives *Australian Geographical Studies* 42 207–20

Zimmerer K S and Young K R eds 1998 *Nature's geography: new lessons for conservation in developing countries* University of Wisconsin Press, Madison WI

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