

# A 2020 vision: urban wildlife in the backyards of the future

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ABSTRACT

Past urban development and gardening practices have had a devastating impact on native wildlife in the suburbs. In this paper the reader is invited to envisage a future where the urban community has embraced the concept of gardens as indigenous wildlife habitat, generally free of lawns and with lower inputs of chemicals and water. In the year 2020 it is envisioned that there is a focus on vegetation from local provenance species and gardens are structured to mimic natural ecosystems to maximise benefits for wildlife. Gardens based on European aesthetic concepts are out of fashion and there is seldom the noise of a motor mower to drown the sounds of native birds. Such a future is within our reach. The vision is clear but the details of how to achieve the desired outcomes are hazy but they are sufficiently complex to develop into a new and exciting discipline.

**Key words:** urban wildlife, inter-generational equity, home garden, habitat restoration, Western Sydney

## The past

A distinguished Durag man, Mr Colin Gale, grew up in the Blacktown area of Western Sydney and was generally familiar with the Sydney basin. As a child, he roamed the local bushland: collected bird eggs, fished in the creeks, rivers, dams and lagoons; shot, ferreted and trapped. He and his friends collected rabbits, bandicoots, sugar gliders, ringtail and brushtail possums, and baby rosellas. He said they achieved all this in their 'seven acre' backyard. A short walk to a dam or creek and they caught eels, perch and collected bags of mussels. Eastern water rats and platypus were also present in the clean waters that the children drank without thought (Gale 2000). This idyllic landscape is echoed in the writing of Pidgeon (1937). He discussed the adjacent sandstone headwaters of the Upper Hawkesbury and Nepean. Native wildlife including platypus, fish and waterfowl were abundant in the area. Other long-term residents in the Hawkesbury – Nepean River catchment confirmed that the lagoons of the area had clear drinkable water (Recher *et al.* 1993).

At European settlement much of the Cumberland Plain (incorporating Blacktown and the Hawkesbury – Nepean River, the region of Colin Gale's youth) consisted largely of open, grassy woodlands and tall, open forests, the result of Aboriginal management that encouraged preferred dietary species, such as kangaroos and emus (Benson and Howell 1990; Recher *et al.* 1993). There were also apparently extensive wetlands (Recher *et al.* 1993) that would have supported eels, perch, platypus and mussels, together with a wide range of birds and mammals.

With European settlement, extensive clearing for agriculture and timber-getting occurred. The associated erosion resulted in severe siltation of local waterways. These changed management practices, which continued unabated until the second world war, undoubtedly changed wildlife habitats and produced different impacts

on the local wildlife to those imposed by Aboriginal management. A wide range of wildlife, some presumably not available to Aborigines because of their less efficient hunting tools, became important to Europeans for food and sport and so the impact was spread to a wider range of species (Recher *et al.* 1993). For example, birds are much more efficiently captured with guns than by any method available to local Aborigines.

Introduced animals would also have exposed the local wildlife to additional new threats. Cats, that continue to prey on local wildlife, have been in the landscape since their introduction with the first fleet and may have been partly responsible for the decline and/or extinction of endemic mammals through predation and introduced disease. A heard of feral cattle, numbering hundreds, had invaded the adjacent mountains by 1801 and by 1883 there was at least one viable population of rabbits in the area. Together with feral cattle, rabbits continued to be a problem into the 20<sup>th</sup> century. Contributing to the substantial pollution load, the stench from decaying dogs in the Hawkesbury River raised complaints in the local newspaper in 1844 and 1845 (Recher *et al.* 1993).

The most immediate wave of 'new' impacts on terrestrial wildlife were, therefore, the expansion of agriculture and timber removal that led to widespread clearing and wildlife habitat fragmentation; disruption of Aboriginal land management and subsequent changed pattern of wildlife usage and ecosystem dynamics (eg. changes to wildlife abundance and species composition, vegetation structure, floristic composition); introduction of feral animals and their parasites; more effective hunting regimes that resulted in additional species being targeted; and over-grazing by introduced stock. Many of these activities influenced erosional patterns and exacerbated pollution problems in local waterways (Recher *et al.* 1993).

Recher *et al.* (1993) reviewed the literature on the aquatic environment of the Hawkesbury – Nepean River and associated wetlands from early European settlement and concluded that, beyond the reaches of saltwater intrusion and except during flood, the river network had clear, clean drinkable water at least until the 1930s. There were extensive beds of ribbon weed that supplied shelter and food for wildlife and was sufficiently abundant to harvest for cattle fodder. Although most comments pertained to species used for food and sport, aquatic wildlife and associated birdlife were abundant.

The major changes post-European settlement to aquatic systems have been the dramatically increased turbidity and associated reduced light penetration, and siltation caused by erosion in the catchment due to European land management practices. Other dramatic impacts have included reduced flushing, due to diminished flows and amplitude; duration and frequency of flooding as a result of impoundments along the main waterway channels and water diversion for catchment activities; and feral species. Although lacking data, impediments to migration and other interruptions to hydrological parameters impact on fish movement (eg. Short-finned eel *Anguilla australis*, Long-finned eel *Anguilla reinhardtii*, Allen 1989; Sloane 1984a,b) and reproduction of aquatic species (eg. Australian Bass *Macquaria novemaculata*, Harris 1988).

Legislation to protect native species, albeit to maintain populations for hunting, was enacted in 1866 (Reed 1991). Despite this early recognition of the influence of Europeans on local fauna the historical pattern of neglect has largely continued (Recher *et al.* 1993). However, over Colin Gale's lifetime the gradual switch from agriculture and forestry to urbanisation has greatly increased the environmental pressures on local wildlife. For example, since the 1950s, 'massive' urban expansion has resulted in the 'virtual elimination' of some bird species in the area (Keast 1995).

## The present

In response to scientific evidence of the vulnerability of the earth and its limited resources, particularly the seminal work of Carson (1963), there has been a sustained rise in environmental consciousness. In parallel has been the emergence of an environmental lobby. Governments at all levels (local to international) have responded with strategies, agreements and policies for environmental management. Within Australia, the primary focus of much protective legislation has been the rural sector with particular emphasis on natural resources (defined by Australian governments as water, soil and vegetation, eg. NSW *Catchment Management Act* 1989). Although frequently not specifically targeted, urban communities have responsibilities under legislation that has enshrined concepts, such as ecological sustainable development (ESD, National Strategy for Ecologically Sustainable Development 1992), conservation of biodiversity (National Strategy for the Conservation of Australia's Biological Conservation 1992), reduction of greenhouse gases (National Greenhouse Strategy 1997) and salinity management (Salinity Strategy 2000).

In parallel with changes to the legislative framework and the Federal Government's Decade of Landcare initiative (1990s), the Landcare movement has been fostered and consequently expanded. In contrast, universities and the broader research community have been 'conspicuously starved of funds' (Lunney *et al.* 2002). Current Federal government initiatives have, therefore, strengthened community care groups by providing access to substantial funding (eg. National Heritage Trust) and in stark contrast, marginalised a critical component of the community environmental decision-making process (ie. those with the theoretical and research skills) (Burgin 2002; Lunney *et al.* 2002; Underwood and Chapman 2002).



Figure 1. Typical modern garden with sweeping lawns and carefully pruned roses. (Photo: S. Burgin.)

Despite the legislation and other government vehicles for change, and the tireless efforts of non-government organisations, communities and individuals, the pace of degradation has, at best, only slowed. Wildlife continues to decline as habitat becomes increasingly fragmented and degraded, at times as a result of the intervention by the very Landcare groups that seek to overcome past degradation (Burgin *et al.* 2003).

A glance at any greenfields development (*i.e.* urban development on previously cleared land, most often agricultural land) around Sydney will reveal the lack of environmental care and potential for loss and/or displacement of wildlife and associated habitats that have occurred during most housing estate development. The recent accelerated expansion of urbanisation, at least in part due to the Federal Government's incentives to boost the building industry in the face of recession, have simply exacerbated environmental degradation due to explosive demand for new homes on small blocks of land (*e.g.* Figure 1) to capitalise on any available housing grants and low interest rates.

So the on-going devastation that Colin Gale and his friends witnessed in their youth continues. This is despite our enhanced awareness and commitment to environmental conservation, together with Herculean efforts by many in government and the broader community. Much is being done in the name of environmental management including tree planting, restoration and rehabilitation, provenance seed collection and lobbying to stop inappropriate development. There have also been major initiatives to encourage wildlife (frequently birds) into gardens (*eg.* Birds in Backyards Program, Parsons and Major 2004). But despite 'winning some battles', the losses are great. The Australian Defence Industries (ADI) site at St Marys (Western Sydney) will be extensively developed, despite part of it being Cumberland Plain Woodland, an endangered ecological community of which less than 10% remains (Benson and Howell 1995). When governments, in the face of fierce opposition, allow such important remnants to be eroded and degraded, it is difficult to perceive that the 'war will be won' over environmental degradation, the decline of biodiversity, loss of wildlife and associated habitats, indeed loss of functioning ecosystems.

Listening to Colin Gale's description of how life changed between his youth and coming of age, I thought of the changes that had occurred over the two decades since I came to Sydney with my young family: the expansion of the city and its infrastructure; urban consolidation; outward movement of peri-urban areas (*ie.* the interface between suburbia and the adjacent rural area); changed land use; on-going removal and/or erosion, and occasional expansion, of native ecosystems; and the sinister signs of salinity due to a raise of the watertable in the soil profile with its associated saline load. These are the 'big picture', more obvious changes but there have also been changes to the fauna within the city and its environs. For example, frogs are declining (Ferraro and Burgin, 1993; White and Burgin 2004), turtles are struggling to survive (Wong and Burgin 1997; White and Burgin 2004), native fish are being

displaced by exotic species, such as *Cyprinus carpio* carp (Harris 1998) and mosquito fish (*eg.* *Gambusia holbrooki*, Morgan and Buttemer 1996), fragmentation is changing the dynamics of macroinvertebrates communities in remnant bushland (Hochuli *et al.* 2004) and saltmarsh (Yerman and Ross 2004), the bird chorus is changing as aggressive exotics and visitors that have outstayed their welcome, have displaced resident species (Catterall 2004; Parsons and Major 2004).

## The challenge

But stop for a moment! The picture is not all gloom. Much is being achieved. The, at times, Herculean efforts of many are reflected in the large number of care groups (*eg.* at September 1, 2003 there were 1713 NSW Landcare groups registered; <http://www.landcare.nsw.gov.au/>) and individuals within the broader community that struggle to maximise the conservation effort through restoration (sometimes unwisely) of ever-diminishing remnant vegetation, habitat for wildlife. However, in the longer term, focusing biodiversity conservation efforts on urban remnants to maintain viable wildlife populations in Western Sydney is not sufficient. Along with most of the Australian national parks and other reserves, urban remnants do not provide sufficient area, habitat diversity or other resources for the long-term maintenance of wildlife, particularly of larger species (Archer 2002).

With our current approach to wildlife management, my grandchildren will not grow up in the world I knew, the world of Colin Gale and his friends. The economy continues to be market driven (*eg.* Recher 2002); human population pressures are increasing (*e.g.* Flannery 1998; Archer 2002); Australia is predominantly a suburban society and, as a consequence, housing and infrastructure demand in and around capital cities continues to expand. In parallel with the sprawling urbanisation, wildlife habitat is lost and degraded at an alarming rate and species are driven to local extinction, if not more broadly (*e.g.* frogs and reptiles, White and Burgin 2004). The 'bizarre tragedy' is that resources have been unavailable to define the losses or monitor the gains (Lunney *et al.* 2002) and without such scientific underpinning of the urban wildlife conservation gains will be, at best, serendipitous (Burgin *et al.* 2002) and, therefore, frequently unexpected (*eg.* Catterall 2004).

There is no easy fix but there are solutions if we have the wisdom. My three grandchildren have honed my sense of intergenerational equity and I have given a great deal of thought to the inevitability of continued urban wildlife extinctions in a context of urban expansion. This may be the inevitable scenario without dramatic changes in the way wildlife issues are addressed. Critical factors to redress include population management and consumerism attitudinal changes, advocated by Australia's most widely recognised zoologists (*eg.* Flannery 1998; Archer 2002; Recher *et al.* 2002). However, there is the potential to begin the 'zoological revolution' (Lunney and Dickman 2002) at the grass roots, in our backyard, by taking on the challenge of the needs of wildlife and working to overcome what Recher (2002) referred to as our 'prevailing ignorance' of wildlife.

In our urban Australian gardens, from the earliest European settlement, endemic plants have been incorporated. Even the most formal gardens generally contain at least a token Australian plant, often a eucalypt or *Grevillea*, albeit frequently a hybrid cultivar. Many gardens also incorporate structural elements that mimic natural habitats. Native wildlife (eg. invertebrates, mammals, reptiles, frogs, birds) live within or, at least visit, virtually all Australian gardens. It is also becoming increasingly popular to encourage native wildlife to gardens (see eg. Catterall 2004; Howard and Jones, 2004; Parsons and Major 2004). We therefore have the basic elements to effectively conserve urban wildlife by expanding their habitats within our gardens. It does not necessarily involve huge sums of money, government intervention or even a major change in lifestyle. Much can be achieved with a simply change of fashion. A change from the European sense of what constitutes a beautiful garden, to a focus on establishing wildlife habitat in our backyards. This trend has already begun (see eg. Clancy 2002; Figure 2).

### The future

Any strategic thinker starts with a vision of the future. I have formulated a vision and I invite you to join with me to envision that future where wildlife is a part of suburban life and gardens are part of the broader habitat for local species.

The most noticeable change between now and 2020 is that native vegetation is widespread throughout the suburbs. Instead of being confined to remnants or the occasional isolated individual plant in a sea of exotic vegetation, houses, carparks, shopping centres and industrial sites, the pattern has changed. Even the roofs of larger buildings are green. This concept was introduced with a Greening Australia (New South Wales) project of the 1990s, designed to grow seedlings on city roofs for later use by landcare groups in their tree planting initiatives. With the extensive drought in the first years of the century and associated water restrictions throughout the Sydney region, gardeners increasingly realised the benefits of local native plants over many of the introduced cultivars that generally required substantially more water to survive. With greater emphasis on native plants, animals seeking food and water increasingly sought urban gardens as refuges and the trend of European water-intensive gardens gave way to native gardens with a wider range of wildlife visitors. Individual aesthetic appeal, garden size and the desire to attract and/or deter specific wildlife species, resulted in a matrix of vegetation such that some gardens tended to be horizontally structured and attracted species that require cover (eg. Catterall's 2003 'Neglected Foliphiles'), while others maintained taller trees and more open gardens that attracted the larger birds and mammals.



**Figure 2.** Wildlife friendly garden with a profusion of native species including trees, vines and herbs providing a range of habitats for visiting fauna. (Photo: S. Burgin).

With these changes the urban development now appears as islands. Buildings all but disappear among the vegetation. The elements of the urban landscape are still there, but there has been a strong emphasis on continuity of wildlife habitat throughout the city. The focus on native vegetation has resulted in a greater abundance of native wildlife, attracted to feed and shelter, and a reduction in feral species that prefer the more open European city landscape of the 20<sup>th</sup> century. This change was supported by dissemination of research (eg. birds, Catterall 2004, Howard and Jones 2004; reptiles and frogs, White and Burgin 2004; invertebrates Yerman and Ross 2004) and programs such as the Birds in Backyards (Parsons and Major 2004) and the Green Web (Buckley 2004).

In the last 20 years a significant injection of funds into professional extension through local government, greater emphasis on urban wildlife education, as advocated by Lunney and Burgin (2004), and targeted research to address what Recher (2002) referred to as “the prevailing ignorance of our interdependence with world ecosystems” has occurred. The result has been better decision-making and enhanced gardens and open space for wildlife use.

In parallel with these changes there has been a greater emphasis on fire research. Homes are routinely ‘fire-proofed’ and individuals and suburbs have integrated bushfire strategies in place. This is one situation where ‘the presumption that land owners...have special rights in how they use and manage the land’ (Recher *et al.* 2002) has been overturned to the betterment of communities and associated wildlife. The concept of ‘property’ has been expanded to incorporate native bushland and, as a result, fires are often controlled before they become a threat to urban areas. With the new concept that bushland is valued as a resource, arsonists are not tolerated and new technology enables their more efficient identification and arrest.

Greenfield housing estate developments are a rarity in 2020 because governments have seriously addressed the city’s population growth and decentralisation. Where they do occur there is an obvious change in approach to the conservation of native vegetation on building sites. Instead of the ‘scorched earth’ approach so frequently used in the past, the builders effectively place dwellings among existing vegetation and thus disruption of wildlife is reduced. Shade houses maintain native vegetation, removed from the building site to use as the basis for landscaping, a concept established by the ‘Wildplant Rescue’ volunteers in the Blue Mountains in the 1990s. Native seed, collected from the site, is also propagated to form the nucleus of the future garden. There are caveats on developments that exclude exotic ornamental or grass species. This was a concept adopted by Griffith University (Nathan campus, Brisbane) from its first construction in the 1970s. A premium price is paid for homes with such caveats in place, in part, because of their recognised value for native wildlife. This reflects attitudinal change within the community from the old-fashioned gardens, based on a sense of European aesthetics, to a focus on the reconstruction of wildlife habitat across the suburbs. Lawns are definitely out of fashion and motor mowers are now becoming collector items.

It is no longer acceptable to allow runoff of excess water, nutrients, herbicides or pesticides from properties. However, this law is of little consequence because there is little need for excessive watering, pesticides or additional nutrients in these ‘new age’ gardens. Water quality in urban runoff has improved and this is reflected in urban waterways. Changed industrial practices, together with consolidation and upgrade of sewerage infrastructure and treatment works have further enhanced water quality. Home gardens and parkland irrigation systems have been modified to ensure that water usage is minimised. Gone are the days of excessive water use required for huge lawns of European grasses. More efficient water use due, in part, to the popularity of growing native species, adapted to local climatic conditions, has further reduced runoff from gardens. These improvements have meant that there has been no serious outbreaks of blue green algae in a decade, local waters have become popular for primary contact recreation and populations of endemic fish, frogs, birds and turtles are flourishing.

In addition, the change in vegetation cover has lowered water tables, and hence reduced the threat of salinity, and flash flooding. Due to innovations in water reticulation, improved effluent treatment and recycling of grey water, there is less demand for water of drinking standard. This has provided savings for government that has been diverted to further upgrade infrastructure and water delivery and, because of community demand, funds have been diverted to management of urban wildlife.

With the decreased demand for day-to-day garden maintenance, the widespread interest in urban wildlife and the large number of retired ‘baby boomers’, the popularity of landcare-type groups has dramatically increased. Trained volunteer teams, led by professionals, have greatly accelerated restoration efforts. The expansion of native vegetation has resulted in the restructure of wildlife habitats. As a consequence, wildlife has become more abundant and many feral species, previously advantaged in European gardens, are now disadvantaged.

With increased native wildlife in suburbia, dogs and cats have become unfashionable pets due to their recognised impact on wildlife and the environment more generally, because of the contribution their faeces has on water pollution. With the removal of the family pets and the recognition that fences impeded wildlife movement, they have also become unfashionable. This had the unforeseen benefit of encouraging more interaction among neighbours and there is now greater community cohesion and lowered crime rate.

In a shady spot in a local park, once mowed with gardens and a wide range of exotic species, I sit to contemplate the changes. The lawns are gone and the park has been redesigned. Paths meander through the bushland and seats are dotted among the trees for people to relax and enjoy the wildlife and general visual amenity. There are still some introduced showy shrubs and trees among the endemic vegetation but they are interwoven into the local ecosystem forming structural elements of the ‘new’ bushland. In the shade of an overhanging tree, there are birds to watch. No longer are the ubiquitous House-sparrow *Passer domesticus*, Domestic pigeon *Columba livia*

and European starling *Sturnus vulgaris*, inhabitants of cities from New York to 'Peking' (Jenkins 1982), fighting for attention but local heath birds flit amongst the shrub layer, red wattle birds *Anthochaera carunculata* feed from the grevilleas and a kookaburra *Dacelo gigas* is having a laugh, maybe at a memory of a past era. There is also the constant rustle of reptiles scampering through the leaf litter while the Blue Tongue Lizard *Tiliqua scincoides* weaves its way slowly through the undergrowth.

My thoughts turn to the changes that have occurred outside the suburbs that had enhanced the outcomes within. For example, it has long been recognised that long-term environmental change has to be accompanied by knowledge and a willingness to seek innovative solutions to historical approaches to wildlife management (eg. Archer 2002; Lunney and Burgin 2004; Recher 2002). In the late 20<sup>th</sup> century environmental education had become a compulsory part of school curricula, however, soon after the turn of the century this requirement was extended to post-secondary education. This greatly enhanced environmental knowledge among decision-makers and in the business world. The changed attitudes towards wildlife and, more generally, a better environmental knowledge base within the community had the indirect outcome of securing a more competitive market for environmental professionals. Urban wildlife managers, a new discipline first developed 20 years ago, are particularly in demand to 'retrofit' suburbs to be more wildlife friendly. Australia was already considered to be at the forefront of natural resource and environmental management in the late 20<sup>th</sup> century but the change in status of environmental education and associated tertiary courses greatly increased income from the export of knowledge through education, consultancy, innovation and research. Australians are now acknowledged leaders in environmental management. At the same time the Australian community has embraced a strong environmental ethic.

A rather daring attempt to influence students beyond the classroom was achieved by commissioning the world leaders in marketing of children's multi-media activities to develop an environmental phenomenon to rival the success of the 'Pokemon'. Substantial funds for the arts were also available for material that addressed environmental themes. As a consequence there is now a 'classic' Star Wars movie where the heroes save the earth from environmental devastation and the modern-day, popular leading hero is a 'new age guy' that embraces conservation both on and off screen. Another method employed to ensure maximum exposure of environmental issues was a deliberate attempt to train environmental professionals to communicate with the wider community. At the turn of the century there were few scientists recognisable in the broader community. Now many have a profile that rivals those of sports, movie and television stars.

State government departments were renamed to better reflect their place in ecological and landscape conservation, they were refocused to have greatly enhanced budgets that reflects the critical importance of their role in wildlife management. In parallel, the portfolio of The Minister for the Environment was upgraded to a most senior cabinet position, both at State and Federal level.

As a result of a forum on urban wildlife, organised by the Royal Zoological Society of New South Wales in 2001, that brought together interested people, there was an increased impetus to expand urban wildlife habitat and to improve education initiatives. There was recognition of the need for research and knowledge transfer to urban residents to encourage high quality environmental management. State and local governments have followed the lead of the Federal government in setting up 'think tanks' of high calibre knowledgeable people (frequently seconded for fixed terms) to provide independent, well-researched advice on a range of urban wildlife issues. This has provided for substantial innovation due to the continued fostering of the community government partnership. Innovations were trialed, modified and implemented and adaptive management, underpinned by research, was widely recognised as the most appropriate approach to decision making. An early success in this regard was the resolution of conflicts over urban possum conservation, initially reviewed by Mathews *et al.* (2004).

Some of the major changes in attitude that have resulted in a 'zoological revolution' (Lunney and Dickman 2002) have been the demise of the presumption that land holders and governments have special rights in land management, a 'revolutionary' proposal of Recher (2002); encouragement of research and innovation in restoration projects identified as a failing by Lunney *et al.* (2002) and others; more informed community of the interdependence of humans in ecosystems (another of Recher's, 2002 requirements for revolution); and development of long term strategic planning to maintain habitat for wildlife, supported by scientific evidence and advocated by Burgin (2002). A concerted effort to encourage plantings of local provenance species in gardens was successful when demand became sufficient for horticulturalists to change their focus from sale of European cultivars to provision of local provenance species.

It is now widely accepted that planning for wildlife means changing community attitudes and that little is achievable without raising environmental consciousness, good science and the commitment of the broader community. With these hurdles crossed it has indeed been possible to expand wildlife habitat across the urban landscape and ensure that our children and grandchildren are left with a better urban environment.

## The way forward

You now have my vision for the future of our backyards. The next phase is to provide the compass to orienteer the way needed to achieve the vision. As I indicated at the outset, there is no easy fix. To realise the vision new thinking is required. It is not sufficient to continue to determine the way ahead with a backward-focused orientation. The result would be the continued erosion of urban wildlife.

Although I have dreamed the vision, I am still struggling to move it to reality. Clearly I am not alone, scientists, landcarers, bureaucrats and others in the broader community are all struggling to reverse the current trend of habitat degradation and wildlife loss and the successes to date are modest. Elements are in place to underpin conservation of urban wildlife, as the mobilisation of a substantial proportion of the community under Landcare attests. However, much

of this effort is currently focused outside the backyard. This is not meant to denigrate the efforts that are occurring but merely to point out that we frequently view the local roadside verge or riparian zone of the local creek differently to our own backyard. A changed perception of our home surrounds would provide the potential to expand wildlife habitat more fully into our everyday life.

One element that is largely missing is the lack of scientific underpinning in wildlife management. The issues are complex and the discipline is barely at the point of emergence. There is much to be achieved. For the sake of the future of our wildlife I encourage you to join with others and envision the process of enhanced urban wildlife conservation.

## Acknowledgments

This paper's formula was loosely based on a presentation by Mike Young. I hasten to add that he did not have grandchildren in the mix. His inspiration had come from an electronic game that allowed the player to navigate through time. As Keynote speaker at a later conference, I modified the concept. Feedback, especially from the office of the Hon. Bob Debus (Minister for the Environment),

was extremely positive. The formula was, therefore, again chosen for this paper. Mike Calver and a second reviewer who chose to remain anonymous, together with Dan Lunney editor, provided helpful advice on the draft. Finally, acknowledgement is due to my children and grandchildren who are a constant inspiration and motivation for working towards a better future for all Australians.

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