

Protected Areas – what do they face when located within a city planning for substantial growth

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Abstract: National parks and reserves are not protected by their designation. Their conservation value is vulnerable to activities often exacerbated by increasing nearby urban development. Protected areas provide essential function and service to cities. These encompass the provision of ecosystem services, city identity as well as social, cultural, recreational and economic value. Environmental science has sought to quantify the impacts of development on the ecosystem function of natural areas. This knowledge is applied to some affect in Australian development assessment processes. However, it would seem that the level of attention given to the cumulative impact of development upon the environmental significance of protected areas is not as well incorporated into the strategic land use planning process, particularly where housing supply and the associated infrastructure is the overarching priority. This paper will, through a case study of four national parks in the growing city of Sydney, Australia, and, using content analysis, explore how statutory planning instruments, planning policies, plans of management and applicable legislation affect the ongoing conservation values. This analysis will be contrasted against broader economic and political influences prioritising growth as reflected in metropolitan and state based plans. The paper will conclude with insights on the efficacy of current strategic and operational practices and identify how broader land use planning and controls can be made to better accommodate conservation with this contemporary challenge of managing urban intensification.

Protected areas and land use planning

The conflict between land use and conservation remains unresolved. Responses to protect natural values have largely fallen to the delineation of land use by zoning - setting a boundary between natural (protected) and developed areas. However, protected areas are often located within city boundaries or immediately interface with them. This proximity makes them vulnerable to urban development (Tryzna 2005, McDonald *et al.* 2009) and deterioration of natural values adversely impact the quality of life of city dwellers (Beatley 2000, Barber *et al.* 2004, Tryzna 2005, Beardsley *et al.* 2009, p.99).

Vulnerability is often enhanced by a lack of integration within governance frameworks. Land use planning and protected area management can be governed by separate laws and policies, administered by distinct agencies within which are different and conflicting agendas and priorities. These factors lead to poor outcomes in conservation terms (Beresford and Phillips 2000, Shadie and Sheppard 2002, Barber *et al.* 2004, Kozlowski and Peterson 2005).

This paper demonstrates that current land use policies make national parks and other significant natural areas susceptible to the impacts of development. It examines how state and local government in Sydney, Australia, use land use planning to manage and protect natural areas. This case study will draw on the content analysis of relevant policies and plans that apply to Sydney and in detail to four national parks located within the city area and the strategic plans of the adjoining councils. The paper concludes by reflecting on the current land use planning system in New South Wales (NSW) and the opportunities that exist to improve conservation outcomes from protected areas while planning and supporting urban growth.

Protected areas and land use planning

The origins of the modern national parks date back to the 1870s to set aside places of beauty and for recreation. The first national park was Yellowstone in the United States (1872) (Beresford and Phillips 2000) and soon after the Royal National Park in Australia (1878) (NSW National Parks and Wildlife Service 2000). Protected areas are now considered to be the key elements for conservation, the provision of ecosystem services as well as contributing to people's well-being in terms of providing places for recreation, cultural

and social pursuits as well as contributing to the local/regional economy (Shadie and Sheppard 2002, Chiesura 2004, Dudley *et al.* 2004, Lockwood *et al.* 2006).

Ecologically, it is acknowledged that protected areas have inherent flaws due to both their 'design' and political aspects (Ovington 1982). Studies in landscape ecology and park management have established that often a protected area is too small, does not contain whole ecosystems or disconnects species from other biodiverse places limiting evolution and breeding (Collinge 1996, Cadieux 2011) and are isolated from each other (Kozlowski and Peterson 1996, Pigram and Sundell 1997). Protected areas are susceptible to development. This may arise from within such as resource extraction (Wright *et al.* 2011), or cross-boundary impacts such as feral species and pollution (Leitmann 1998) which can come from urban pressures nearby (Garratt 1982). Researchers have suggested that any protected area located within 50 kilometres of an urban area would be adversely affected (McDonald *et al.* 2009) highlighting that the impacts from "beyond-the-boundary" are of major concern (Pigram and Sundell 1997, Hostetler *et al.* 2011).

It is problematic to apply the principles of sustainable development (Beresford and Phillips 2000) to the management of the protected areas particularly within or in the shadow of urban areas (Tryzna 2005). Urban areas may have complex governance arrangements including separate state government agencies responsible for urban land and for protected areas and often multiple councils that surround the protected area with differing priorities (Allen 2003, Pendlebury *et al.* 2009). In Australia each state or territory has a separate act governing national parks and land use planning. Administratively most states have separate agencies responsible for these functions (a notable exception is in NSW where one agency, the Department of Planning and Environment exists, however, Ministerial responsibility is split and departmental structures are divided).

There exists the inside/out and outside/in conundrum. This is where agencies and land managers have demarcated areas of 'control', that is they can directly affect the operation, and 'influence' where they have only indirect control or can only advocate for an operational outcome. This is particularly relevant to the management of a national park. A park manager may have direct control over the activities within their area and statutory responsibility. The capacity to influence what occurs beyond the boundary is limited and relies on indirect influence or other legislative/policy levers. Protected area managers acknowledge that despite understanding that the most adverse impacts come from outside a park they have very little involvement in influencing or participating in discussions about these external impacts (Shadie and Sheppard 2002). As land use decisions are being made outside the spatial and often legal demarcation of protected area management, broader urban and regional planning has the opportunity to strategically consider biodiversity and sustainability into policies and planning frameworks (Pierce *et al.* 2005).

Does protected area management inform land use planning?

While science articulates the problems facing protected areas there is a lack of empirical evidence to suggest that this knowledge is integrated into land management policy and practice (Figueroa and Aronson 2006). This is demonstrated by various studies from the United States that highlight the subordinate nature of protected area management in the coordination and strategic alignment of land use plans and policies and in the development approval process. A review of land use planning responses to minimize the impact of urban sprawl demonstrated a lack of coordination across jurisdictional boundaries and that natural areas were not being adequately protected (Bengston *et al.* 2004). This is compounded where the more detailed land use planning is mainly undertaken by local government authorities leading to development approvals in "conservation hot spots", so designated by other levels of government (Brody 2003, Brody and Highfield 2005). Further, other normative planning responses are also ineffective including protecting isolated pockets of 'nature' (Beatley 2000, Grimm *et al.* 2000). Land use planning can implement strategy which addresses the form and size of a city to minimize the impact of spreading cities and suburbia (Beatley 1995, Beatley 2000, Newman and Jennings 2008, Beardsley *et al.* 2009). The shape and size of cities, such as density and footprint, as well as supporting infrastructure have been shown to influence the degree that an urban settlement impacts upon non-urban elements (Beatley 1995, Johnson 2001, Hostetler *et al.* 2011). A collective of factors weakening conservation efforts (Bengston *et al.* 2004).

The ecosystem approach has been promoted as a better integrated approach to conservation in cities (Newman and Jennings 2008). This would position planning for nature protection at the scale of the city, meaning that the biodiversity contained within it and in its outskirts, are managed together (Beatley 2000). Thus, conservation of natural values in protected areas is only possible if consideration is given to the land uses and other natural values outside the boundaries of parks and reserves. This suggests a larger spatial scale for managing natural values beyond-the-boundaries may be appropriate.

Sydney and four significant natural protected areas

Australia's largest city by population is Sydney (approximately 4.8million). Projections for the current metropolitan plan anticipate an increase of 1.6 million people over the next 20 years (NSW Planning and Environment 2014). Key strategic issues identified are the provision of housing, jobs and infrastructure.

Sydney has 49 protected areas ranging from national parks to reserves (NSW National Parks and Wildlife Service undated). There are four large and iconic national parks - Blue Mountains, a part of the Greater Blue Mountains World Heritage Area (Blue Mountains NP); Royal National Park (Royal NP), the second oldest national park in the world; Ku-ring-gai National Park (Ku-ring-gai NP) to the north; and Lane Cove National Park (Lane Cove NP), enclosed by the city.

The distribution of the national parks to the north, south and west, along with topographical features such as the Great Dividing Range to the west and the Tasman Sea to the east, contribute to and largely define Sydney's boundaries. (Figure 1). The map is taken from the current strategic plan for Sydney (NSW Planning and Environment 2014). It illustrates the urban areas and proximity to three of the national parks of this study. It also illustrates the Metropolitan Rural Area which is discussed in this paper.

Figure 1: Sydney and national parks (NSW Planning and Environment 2014, p.99)



These national parks are important to Sydney. They deliver ecosystem services, contribute to water catchments of Sydney (Blue Mountains NP), provide recreational, cultural and aesthetic values and economically contribute significantly to Sydney via tourism dollar spend (Department of Environment Climate Change and Water NSW 2009). The national parks also contribute to Sydney's defining character. The strategic plan for Sydney states that *Sydney is part of a bioregion that includes over 12 million hectares of national parks and nature reserve, including the Blue Mountains National Park, The Royal National Park and Ku-ring-gai National Park* (NSW Planning and Environment 2014, p.96). Responsibility for the management of land is fragmented between multiple government agencies and also devolved to local government. National Parks in NSW are Crown land and are managed by the state government through the *National Parks and Wildlife Act 1974* (New South Wales Government 1974). This Act established the National Parks and Wildlife Service and its objectives (s2a) and functions (ss7, 12) including that each park has a *Plan of Management (POM)* (Part 5). The POM identifies issues and outlines management responses (s72AA(1)(g)) and importantly *the statutory natural resource management, land use management plans and land management practices of land surrounding or within a region of the reserved land* (s72AA(1)(r)) (New South Wales Government 1974).

Urban and regional planning is set by the *Environmental Planning & Assessment Act, 1979* (EPAA) (New South Wales Government 1979). Responsibility falls to the Minister for Planning and the Department of

Planning and Environment. Land use planning policy is managed through statutory environmental planning instruments (EPI) and other mechanisms. One type of EPI is local environmental plans (LEP). Local government is the relevant planning authority most often charged with the responsibility for developing and applying the instrument and other EPIs as part of its planning functions. The management of land by local government is prescribed in the *Local Government Act 1993* (NSW) (New South Wales Government 1993). Local government must classify all public land (s25) and prepare plans of management for community land (Part 2, Division2) including that which may have specific natural environmental or cultural attributes (ss36a-36E).

New South Wales has been reforming its land management framework for some time (Ruming and Davies 2014). Planning reform, a review of biodiversity legislation and change to local government planning have all been undertaken in recent years and remain an ongoing political priority. As part of the reforms to the NSW governance framework state business priorities are to be vertically integrated with the objectives of the *State Plan* (New South Wales Government 2011)¹. Objectives and targets around environmental performance or development growth are found here. This means that other government plans or policies are to implement or complement these. These reforms apply to local government and are reflected in the requirements for Community Strategic Plans to have *regard to the State Government's State Plan and other relevant State and regional plans of the State Government* (s402(3)d) (New South Wales Government 1993). These CSPs include the financial and operational planning for each council and are developed in consultation with the community. CSPs are likely to be the voice of the community as well as a reflection of the policy position of the council (Davies and Selmon 2013).

Investigating plans and policies

Strategic policy directions are articulated in plans and policies and facilitated by actions to be implemented, such as land use controls (Berke and French 1994, Norton 2008) or park management actions (often contained in plans of management). Thus, if the protections or conservation of natural values within a national park is of consideration in policy it should be found in the plans that guide land management of the parks and surrounds. Based upon the literature, and the experience of the authors with a background in planning practice familiar with land use plans and policies, content analysis criteria was established. This was designed to test the vertical integration of plans within and between levels of government and across a spatial scale (Sydney) (Table 1).

Firstly, we sort to identify whether a national park was recognized in a plan or policy. This could be done in text or in a map. Secondly, objectives were examined to ascertain the importance the national park to the agency responsible for the plan (state or local). We anticipated that if natural values were recognized then objectives to conserve them should follow. Following along from this, the plans were reviewed to identify how the objectives would be delivered through actions. Finally, the analysis sort to identify any measures to gauge success of a plan. These criteria were used to analyse 38 documents: the State Plan, 4 regional action plans, the metropolitan plan for Sydney, 13 LEPS, 12 CSPs and 7 POMs (Table 1, including a strategic plan for the Blue Mountains world heritage area).

Table 1: National Parks, State, local and park plans and policies and analysis criteria (National Parks adjoining local government areas are shown in bold and italics)

Criteria	Documents for analysis
Recognition: protected area mentioned; importance recognized (ecological, social, economic); risk from urban	The State Plan: <i>NSW 2021 A Plan to make NSW Number One</i> (New South Wales Government 2011) Northern Sydney Regional Action Plan (NSW Government 2012b) Northern Beaches Regional Action Pan (NSW Government 2012a) Southern Sydney Regional Action Plan (NSW Government 2012c)

¹ The State Plan was replaced after submission of this paper for review.

development/proximity to city	Western Sydney & Blue Mountains Regional Action Plan (NSW Government 2012d)
Objective: to minimize risk; to ensure longevity; to conserve natural values; balance between development and conservation	Metropolitan plan: <i>A Plan for Growing Sydney</i> (NSW Planning and Environment 2014) Local Environmental Plans and Community Strategic Plans from (<i>relevant national park in bold italics</i>) *Blue Mountains (LEP2005 and 1991) <i>Blue Mountains</i> (<i>Blue Mountains City Council 1991, Blue Mountains City Council 2005, Blue Mountains City Council 2013</i>) *Hawkesbury <i>Blue Mountains</i> (Hawkesbury City Council 2012, Hawkesbury City Council 2013)
Action: specific land use controls; land acquisition to increase park estate; limits over interface lands; consolidation targets	*Hornsby <i>Ku-ring-gai</i> (Hornsby Shire Council 2011, Hornsby Shire Council 2013) *Ku-ring-gai <i>Ku-ring-gai, Lane Cove</i> (Ku-ring-gai Council 2013, Ku-ring-gai Council 2015) *Lane Cove <i>Lane Cove</i> (Lane Cove Council 2009, Lane Cove Council undated) *Penrith <i>Blue Mountains</i> (Penrith City Council 2010, Penrith City Council 2013) *Pittwater <i>Ku-ring-gai</i> (Pittwater Council 2014, Pittwater Council undated) *Ryde <i>Lane Cove</i> (City of Ryde 2013, City of Ryde 2014)
Measures: reporting mechanism; health status of park; implementation of conservation actions	*Sutherland <i>Royal</i> (Sutherland Shire Council 2011, Sutherland Shire Council 2015, Warringah Council 2015) *Warringah <i>Ku-ring-gai</i> (Warringah Council 2011, Warringah Council 2015) *Willoughby <i>Lane Cove</i> (Willoughby City Council 2012, Willoughby City Council undated) *Wollongong <i>Royal</i> (Wollongong City Council 2009, Wollongong City Council 2012) Park Plan of Management from *Blue Mountains NP (+ world heritage plan)(NSW National Parks and Wildlife Service 2001, NSW National Parks and Wildlife Service 2009) *Ku-ring-gai NP (NSW National Parks and Wildlife Service 2014) *Lane Cove (+draft) (NSW National Parks and Wildlife Service 1998, NSW National Parks and Wildlife Service 2012) *Royal NP (+ amendments) (NSW National Parks and Wildlife Service 2000, NSW National Parks and Wildlife Service 2010)

The analysis also considered the vertical integration of policy priorities. Starting with the NSW State Plan, the analysis continued with the *Regional Action Plans* which articulate projections of population and employment and identify regional priorities. Each plan was read to identify whether the conservation of protected areas was considered a State priority and whether the individual national parks were identified as being of importance. Vertical integration analysis continued by examining the CSP and LEP of each of the 12 local councils in order to determine consistency with State level policy. The introduction of the CSP process was designed to bring together four plans previously prepared by councils including their Management Plan, Social Plan, Annual Report and State of the Environment Report as well as provide consistency to state plans and policies including those informing urban and regional planning (NSW Government 2013). Again the criteria of recognition, objective, action (or development control which the expression for action in a LEP) and measures were applied. At the same time, horizontal integration was investigated. In other words, did the CSP and the LEP of each council area articulate the same or complementary recognition, objective, action or measures? While these documents are written in different ways and for different purposes, their complementarity is a crucial factor in ensuring effective policy implementation.

How national parks are prioritised in plans and policies

The plans and policies were analysed against the four criteria in Table 1. In terms of recognition (criteria 1) there was little evidence to suggest that either or all of the four national parks are specifically strategically important in their own right. A few plans and policies contained specific objectives (criteria 2) relating to protection and longer term conservation of the relevant national park/s and how this could be achieved in the context of increasing urban development. Mention of the need for or inclusion of specific planning controls or actions (criteria 3) were not present in most of the plans. Reporting measures (criteria

4) were the least identified criteria across the suite of plans. Table 2 provides a summary of the content analysis. While the content analysis revealed an underwhelming positioning of protected area management in urban and regional planning, conservation of natural values can be interpreted from the plans as important strategically even though it is not clearly articulated.

Table 2: The number of plans and policies analysed against criteria to identify consideration of the conservation of protected areas in a growing city

	State Plans (n=5)	Land use strategic plans (N=14)	Community Strategic Plans (n=12)	Park plans of management (n=4)
Criteria				
Recognition	3	3	4	4
Aims/objectives	1	3	1	4
Action	1	3	1	4
Measure	0	0	1	0

Planning

The State Plan's priority is to enable economic growth (New South Wales Government 2011). Goal 22 *Protect Our Natural Environment* explicitly positions national parks as important to the state (New South Wales Government 2011, p.43). It includes "targets" and "priority actions" to protect natural values. These include the management of weeds and pests in parks, restoration of degraded sites and creation of a new national park in south-western Sydney. The State Plan contains the broad objective to *protect our natural environment* but there is no direct mention of any of the 22 national parks in Sydney (New South Wales Government 2011, p.3).

The State Plan is supported by a number of *Regional Action Plans* (RAPs) The Northern Beaches RAP contains no specific mention of the Ku-ring-gai Chase NP and makes only generic claims about protecting the environment. The Northern Sydney RAP states that Ku-ring-gai and Lane Cove NPs are assets, particularly tourism for the latter, but does not outline specific objectives as to how it should be managed. The Southern Sydney RAP which applies to the area containing Royal NP notes the significance of the park but objectives are limited to increasing tourism opportunities not broader conservation outcomes. The Southern Sydney RAP states a need to balance development *with access to green space* but this is tied to recreational opportunities and not conservation (NSW Government 2012c). The Western Sydney and Blue Mountains RAP recognises the significance of the Blue Mountains NP and states that it *will be protected and maintained alongside urban development within the region* (NSW Government 2012d, p.1) and that it is one of *Australia's largest and fastest growing regional populations* (NSW Government 2012d, p.2). This RAP has a set of priority actions tied to conservation and linking that to the impact of development but performance measures are not identified for those relating to the national parks.

A Plan for Growing Sydney (Sydney Plan) seeks to guide decisions about land use over 20 years (NSW Planning and Environment 2014). The plan forecasts an additional 1.6 million people will live in Sydney and estimates that an additional 664,000 dwellings will be required. The plan indicates that 900,000 people will live in Western Sydney. This would bring more development in proximity to the Blue Mountains but as yet there are no subregional plans to explain how growth will be managed. The Sydney Plan contains goals specifically addressing sustainability of environmental assets and notes the importance of balance between the use of land and natural resources (NSW Planning and Environment 2014). It specifically recognises Blue Mountains, Ku-ring-gai and Royal national parks as significant places that should be protected and connected ecologically. The *Metropolitan Rural Area* (MRA) is relevant to these three national parks as land that falls between developed areas and protected areas (NSW Planning and Environment 2014). The Sydney Plan outlines that the MRA should have a specific strategic approach to enable the anticipated growth, specifically the large population growth in the west, with protection of natural assets. In addition, the Sydney Plan highlights the importance of using EPIs as a means of ensuring conservation. The Sydney Plan does not include any performance measures. Measures may be an inclusion in the upcoming subregional plans.

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The State Plan and the Sydney Plan are vertically integrated. Of note and as would be expected the Sydney Plan, due to its smaller geographic scale, articulates conservation by place as well as containing broader objectives and actions.

All CSPs and LEPs contained reference to the importance of protecting natural values. Only Blue Mountains, Hornsby, Ku-ring-gai and Pittwater Councils recognised any national parks by name in their CSPs. Only the Blue Mountains LEP named a national park in the objectives. The other LEPs contained generic aims to protect natural values or significant landscapes. Council's CSP and LEP were consistent in terms of their recognition of national parks or more broadly objectives to protect natural values.

The extent to which CSP considered the impacts of urban growth on natural and protected areas was difficult to determine across the councils and the statements relating to natural area management in the CSPs varied widely. Some plans contained generic statements that *the natural environment is to be protected and enhanced* (Wollongong City Council 2012, p.56). Willoughby's CSP states that it will need to *protect environmentally sensitive areas from human impacts and climate change* (Willoughby City Council undated, p.23). In contrast Penrith's CSP places economic growth as a key priority area and simply notes that natural values are protected through environmental zones in their LEP (Penrith City Council 2013).

A varied approach to address urban development and conservation was observed in those councils which gave specific reference to national parks in their CSPs (e.g. Blue Mountains, Hornsby, Ku-ring-gai and Pittwater). Blue Mountains' CSP identified concerns about State-driven changes to its LEP and the detrimental impacts that this may have on the protection of natural areas. For example '*retaining the strengths of the Blue Mountains Local Environmental Plan in protecting the unique environmental and cultural values of the Blue Mountains, given its required conversion to a 'Standard Instrument' is a high priority*' (Blue Mountains City Council 2013). The Blue Mountain's CSP contains an array of actions and measures to enable the conservation of the national park. The importance of this protected area to the community and council is the clearest of all councils possibly aided by their identity as *a city within a world heritage area* (Blue Mountains City Council 2013)

Hornsby's CSP indicates that the council will rely upon its LEP to *ensure that new development is sustainable and compatible with the character of the Shire* in light of state growth targets (Hornsby Shire Council 2011, p.42). Pittwater Council's response to urban growth is to set out objectives to protect environmental assets. However, upon further reading it is apparent that there is an emphasis on coastal areas rather than a consideration of Ku-ring-gai NP.

Ku-ring-gai Council uses compelling language to underline the importance of the conservation of natural assets as part of its land use planning. The CSP states that *it is a lasting willingness to advocate on behalf of the community to preserve the area's natural and historical assets* (Ku-ring-gai Council 2013, p.41). Ku-ring-gai ties this value proposition directly to the operation of the LEP where, in the CSP, it states *a robust planning framework is in place to deliver quality design outcomes and maintain the identity and character of Ku-ring-gai* (Ku-ring-gai Council 2013, p.40).

Pittwater Council recognises that its area is undergoing growth and sets out to protect environmental assets. However, while the objectives seek conservation the emphasis is upon the coastal area rather than applied to protect Ku-ring-gai NP (Pittwater Council undated).

Park plans of management

All plans of management are written by the respective regions of the NSW National Parks and Wildlife Service with the conservation of the values of the park in mind. The plans also identify the risks and management responses to those risks. All the plans (n=7) identified adverse impacts from urban settlement as being management issues for each park including deterioration in catchment health, increasing soil erosion, habitat loss and proximity of development (NSW National Parks and Wildlife Service 2012, NSW National Parks and Wildlife Service 2014). In the strategic plan for the Greater Blue Mountains World Heritage Area (GBMWA) it states that *the potential for these threats to degrade the*

World Heritage values of the GBMWSHA is exacerbated by the property's mostly rugged terrain and close proximity to urban development (NSW National Parks and Wildlife Service 2009, p.23). Further the POM for the Blue Mountains NP says that *the proximity of Sydney and the urban areas of the Blue Mountains, together with the rapidly growing demand for nature-based tourism and recreation, create complex management requirements for the park* (NSW National Parks and Wildlife Service 2001, p.6). Blue Mountain City Council's CSP is aligned with this, stating at Objective 1.5, Strategy b that *all levels of government with shared responsibilities for protecting Blue Mountains World Heritage values, work together to resource priority environmental management risks* (Blue Mountains City Council 2013, p.32). The POM for Royal NP states that *a moderately large national park such as Royal National Park which is surrounded by urban agglomerations and receives up to three million visitors each year requires a sophisticated management infrastructure* (NSW National Parks and Wildlife Service 2000, p.61).

The plans of management articulate clear intention to work cooperatively with the agencies that manage the land beyond the boundaries of parks. It also appears that here is a reliance on the existing planning framework to protect the park (NSW National Parks and Wildlife Service 2009) and at the same time the management of the land within park boundaries is also influenced by the planning framework and water catchment protection measures which are taken into consideration when a development or works within the park are proposed (NSW National Parks and Wildlife Service 2000, NSW National Parks and Wildlife Service 2001). All POMs contains commitments to work cooperatively with other agencies to best manage the parks (NSW National Parks and Wildlife Service 2014, p.14) demonstrating that protected area managers are aware of the need to work beyond-the-boundaries to help conserve their parks from urban impacts including fire, weeds, litter and pollution via stormwater.

CONCLUSION

This paper has examined the land use responses to protected areas. Taking Sydney and its four iconic national parks of the Blue Mountains, Ku-ring-gai, Lane Cove and Royal, it was found that there is very little specific consideration of national parks in land use planning.

The State Plan articulates the priority of economic growth. This is reflected in some local government CSPs, such as Penrith (Penrith City Council 2013). The Sydney Plan, with a smaller geographic focus mentions three of the national parks by name. It recognises national parks are important ecologically as well as economic and social reasons, particularly the provision of tourism and recreational benefits. There are few policy initiatives in the Sydney Plan that addresses the impending growth of Sydney and the consequent direct and indirect impact on the city's national parks apart from the creation of the *Metropolitan Rural Area* (MRA) serving as an interface between urban development and the major regional national parks (NSW Planning and Environment 2014).

From a hierarchy perspective it is reasonable to anticipate that detail and geographic specificity will increase as a plan focuses from the whole of state to a local area. Where the consideration of natural values in protected areas is concerned it is not always the case. Many of the councils examined in this study did not specifically mention in their community strategic plan the presence, proximity or value that the adjoining national parks and their contribution to the local character, sense of place or biodiversity. Blue Mountains City Council provided the best example of how a local council recognises and values the national park that in many ways is the defining feature of the local area. Local planning instrument (LEP) do provide important objectives relating to specific land use zones that contribute to the conservation of biodiversity outcomes but often only where the zoning is relevant. Land use controls designed to benefit protected areas are varied across the councils and are inconsistent in both approach and their conservation intent.

From the perspective of the urban and regional planner, this research can point towards the need to address three immediate aspects to help manage protected areas. Firstly, develop robust and quantifiable controls for interface lands adjoining national parks to reduce their environmental impacts and conserve biodiversity. Secondly, expand the functional influence of national park plans of management and the agency itself to have a greater statutory role and influence on adjoining lands and

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impacting activities. Finally, identify and protect through local zoning, land use controls and management practices regional scale biodiversity connections between protected areas.

REFERENCES

- Allen, A., 2003. Environmental planning and management of the peri-urban interface: perspectives on an emerging field. *Environment and Urbanization*, 15, 135-147.
- Barber, C.V., Miller, K.R. & Boness, M. (eds.) (2004) *Securing Protected Areas in the Face of Global Change: Issues and Strategies*, Gland, Switzerland: World Commission on Protected Areas (WCPA) and The World Conservation Union (IUCN).
- Beardsley, K., Thorne, J.H., Roth, N.E., Gao, S. & McCoy, M.C., 2009. Assessing the influence of rapid urban growth and regional policies on biological resources. *Landscape and Urban Planning*, 93, 172-183.
- Beatley, T., 1995. Planning and Sustainability: The Elements of New (Improved?) Paradigm. *Journal of Planning Literature*, 9, 383-395.
- Beatley, T., 2000. Preserving Biodiversity: Challenges for Planners. *Journal of the American Planning Association*, 66, 5-10.
- Bengston, D.N., Fletcher, J.O. & Nelson, K.C., 2004. Public policies for managing urban growth and protecting open spaces: policy instruments and lessons learned in the United States. *Landscape and Urban Planning*, 69, 271-286.
- Beresford, M. & Phillips, A., 2000. Protected Landscapes: A conservation model for the 21st Century. *The George Wright Forum*, 17, 15-26.
- Berke, P.R. & French, S.P., 1994. The Influence of State Planning Mandates on Local Plan Quality. *Journal of Planning Education and Research*, 13, 237-250.
- Blue Mountains City Council, 1991. Blue Mountains Local Environmental Plan 1991.
- Blue Mountains City Council, 2005. Blue Mountains Local Environmental Plan.
- Blue Mountains City Council, 2013. Sustainable Blue Mountains 2025. Our City/ Our Future. Katoomba, Australia: Blue Mountains City Council.
- Brody, S.D., 2003. Measuring the effects of stakeholder participation on the quality of local plans based on the principles of collaborative ecosystem management. *Journal of Planning Education and Research*, 22, 407-419.
- Brody, S.D. & Highfield, W.E., 2005. Does Planning Work? Testing the Implementation of Local Environmental Planning in Florida. *Journal of the American Planning Association*, 71, 159-175.
- Cadieux, K.V., 2011. Competing discourses of nature in exurbia. *GeoJournal*, 76, 341-363.
- Chiesura, A., 2004. The role of urban parks for the sustainable city. *Landscape and Urban Planning*, 68, 129-138.
- City of Ryde, 2013. Livestyle and opportunity @ your doorstep. The City of Ryde 2025 Community Strategic Plan.
- City of Ryde, 2014. Ryde Local Environmental Plan 2014.

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Collinge, S.K., 1996. Ecological consequences of habitat fragmentation: Implications for landscape architecture and planning. *Landscape and Urban Planning*, 36, 59-77.

Davies, P.J. & Selmon, N., 2013. Streamlining the planning process and supporting local identity and character - can the two exist? *Proceedings of the State of Australian Cities Conference*. Sydney.

Department of Environment Climate Change and Water Nsw, 2009. Economic benefits of national parks and other reserves in New South Wales. Summary report. . Sydney: Department of Environment,Climate Change and Water NSW. .

Dudley, N., Hockings, M. & Stolton, S., 2004. Options for guaranteeing the effective management of the world's protected areas. *Journal of Environmental Policy and Planning*, 6, 131-142.

Figueroa, B.E. & Aronson, J., 2006. New linkages for protected areas: Making them worth conserving and restoring. *Journal for Nature Conservation*, 14, 225-232.

Garratt, K., Year. The relationship between adjacent lands and protected areas: issues of concern for the protected area manager. In: J.A. Mcneely & K.R. Miller, ed.^eds. *National parks, conservation and development: the role of protected areas in sustaining society: The World Congress on National Parks*, Bali, Indonesia: Smithsonian Institution Press, 65-71.

Grimm, N.B., Grove, J.M., Pickett, S.T.A. & Redman, C.L., 2000. Integrated approaches to long-term studies of urban ecological systems. *Bioscience*, 50, 571-584.

Hawkesbury City Council, 2012. Hawkesbury Local Environmental Plan 2012.

Hawkesbury City Council, 2013. Hawkesbury Community Strategic Plan 2013-2032. Windsor, Australia.: Hawkesbury City Council.

Hornsby Shire Council, 2011. 2010-2020 Hornsby Shire Community Plan. Creating a living environment. Hornsby, Australia: Hornsby Shire Council.

Hornsby Shire Council, 2013. Hornsby Local Environmental Plan 2013.

Hostetler, M., Allen, W. & Meurk, C., 2011. Conserving urban biodiversity? Creating green infrastructure is only the first step. *Landscape and Urban Planning*, 100, 369-371.

Johnson, M.P., 2001. Environmental impacts of urban sprawl: A survey of the literature and proposed research agenda. *Environment and Planning A*, 33, 717-735.

Kozlowski, J. & Peterson, A., 1996. Protecting the protected: Buffer zone planning in Poland and Australia. *Parks: The International Journal for Protected Area Management*, 6, 35-49.

Kozlowski, J. & Peterson, A., 2005. *Integrated buffer planning* Hants, England: Ashgate.

Ku-Ring-Gai Council, 2013. Our Community. Our Future. Community Strategic Plan 2030. Gordon: Ku-ring-gai Council

Ku-Ring-Gai Council, 2015. Ku-ring-gai Council Local Environmental Plan 2015.

Lane Cove Council, 2009. Lane Cove Local Environmental Plan 2009.

Lane Cove Council, undated. Community Strategic Plan Lane Cove 2025. Lane Cove: Lane Cove Council.

State of Australian Cities Conference 2015

Leitmann, J., 1998. Policy and practice options for managing protected areas: lessons from international experience. *Journal of Environmental Planning and Management*, 41, 129-144.

Lockwood, M., Worboys, G. & Kothari, A., 2006. *Protected areas management: a global guide* London: Earthscan.

Mcdonald, R.I., Forman, R.T.T., Kareiva, P., Neugarten, R., Salzer, D. & Fisher, J., 2009. Urban effects, distance, and protected areas in an urbanizing world. *Landscape and Urban Planning*, 93, 63-75.

New South Wales Government, 1974. National Parks and Wildlife.

New South Wales Government, 1979. Environmental Planning and Assessment Act.

New South Wales Government, 1993. *Local Government Act* [online].
<http://legislation.nsw.gov.au/maintop/view/inforce/act+30+1993+cd+0+N> [Accessed Access Date

New South Wales Government, 2011. NSW 2021 A Plan to make NSW Number One.

Newman, P. & Jennings, I., 2008. *Cities as Sustainable Ecosystems: Principles and Practices* Washington, DC: Island Press.

Norton, R.K., 2008. Using content analysis to evaluate local master plans and zoning codes. *Land Use Policy*, 25, 432-454.

Nsw Government, 2012a. Northern Beaches Regional Action Plan. In D.O.P.A. Cabinet (ed.) Sydney: Department of Premier and Cabinet.

Nsw Government, 2012b. Northern Sydney Regional Action Plan. In D.O.P.A. Cabinet (ed.) Sydney: Department of Premier and Cabinet.

Nsw Government, 2012c. Southern Sydney Regional Action Plan. In D.O.P.A. Cabinet (ed.) Sydney: Department of Premier and Cabinet.

Nsw Government, 2012d. Western Suburbs and Blue Mountains Regional Action Plan. In D.O.P.A. Cabinet (ed.) Sydney: Department of Premier and Cabinet.

Nsw Government, 2013. White Paper – A new planning system for NSW.

Nsw National Parks and Wildlife Service, 1998. Lane Cove National Park Plan of Management.

Nsw National Parks and Wildlife Service, 2000. Royal National Park, Heathcote National Park and Garawarra State Recreation Area Plan of Management.

Nsw National Parks and Wildlife Service, 2001. Blue Mountains National Park Plan of Management.

Nsw National Parks and Wildlife Service, 2009. Greater Blue Mountains World Heritage Area. Department of Environment and Climate Change (NSW).

Nsw National Parks and Wildlife Service, 2010. Amendments to the Royal National Park, Heathcote National Park and Garawarra State Conservation Area Plan of Management 2000. Department of Environment, Climate Change and Water.

Nsw National Parks and Wildlife Service, 2012. Lane Cove National Park Draft Plan of Management Sydney: Office of Environment and Heritage

State of Australian Cities Conference 2015

Nsw National Parks and Wildlife Service, 2014. Ku-ring-gai Chase National Park and Lion Island, Long Island and Spectacle Island Nature Reserves.

Nsw National Parks and Wildlife Service, undated. NSW National Parks Pocket guide to Sydney and surrounds. *In* National Parks and Wildlife Service (ed.).

Nsw Planning and Environment, 2014. A Plan for Growing Sydney.

Ovington, J.D., Year. Ecological processes and national park management. *In*: J.A. Mcneely & K.R. Miller, ed.^eds. *National parks, conservation and development: The role of protected areas in sustaining society: The World Congress on National Parks*, Bali, Indonesia: Smithsonian Institution Press, 60-64.

Pendlebury, J., Short, M. & While, A., 2009. Urban world heritage sites and the problem with authenticity. *Cities*, 26, 349-358.

Penrith City Council, 2010. Penrith Local Environmental Plan 2010.

Penrith City Council, 2013. Penrith Community Plan. Penrith: Penrith City Council.

Pierce, S.M., Cowling, R.M., Knight, A.T., Lombard, A.T., Rouget, M. & Wolf, T., 2005. Systematic conservation planning products for land-use planning: Interpretation for implementation. *Biological Conservation*, 125, 441-458.

Pigram, J.J. & Sundell, R.C. (eds.) (1997) *National Parks and Protected Areas: Selection, Delimitation, and Management*. Centre for Water Policy Research, University of New England.

Pittwater Council, 2014. Pittwater Local Environmental Plan 2014.

Pittwater Council, undated. Pittwater 2025 Our Community Strategic Plan. Avalon, Australia: Pittwater Council.

Ruming, K.J. & Davies, P.J., 2014. To what extent 'an entirely new approach to how planning is done'? Tracing planning system reform in New South Wales. *Australian Planner*, 51, 122-131.

Shadie, P. & Sheppard, D., Year. Towards a new paradigm for protected areas in the 21st Century. *In*: I. Camarda, M.J. Manfredi, F. Mulas & T.L. Teel, ed.^eds. *9th ISSRM: Global Challenges of Parks and Protected Area Management Conference 10-13 October*, La Maddalena, Sardinia, Italy: Fondazione Banco di Sardegna, 439-462.

Sutherland Shire Council, 2011. Our Shire, Our Future. Our Guide for Shaping the Shire to 2030. Sutherland Shire's Community Strategic Plan, December 2011. Sutherland: Sutherland Shire Council.

Sutherland Shire Council, 2015. Sutherland Shire Local Environmental Plan 2015.

Tryzna, T., Year. The Urban Imperative: Urban Outreach Strategies for Protected Area Agencies *In*: T. Tryzna, ed.^eds. *Vth IUCN World Parks Congress: The Urban Imperative: Urban Outreach Strategies for Protected Area Agencies*, Durban, South Africa: IUCN: The World Conservation Union & Santa Monica Mountains Conservancy.

Warringah Council, 2011. Warringah Local Environmental Plan 2011.

Warringah Council, 2015. *Warringah's Community Strategic Plan* [online]. Warringah Council. Available from: <https://eservices1.warringah.nsw.gov.au/ePlanning/live/Public/xc.community/default.aspx> [Accessed Access Date 2015].

State of Australian Cities Conference 2015

Willoughby City Council, 2012. Willoughby Local Environmental Plan 2012.

Willoughby City Council, undated. Willoughby City Strategy 2013-2029. Chatswood: Willoughby City Council.

Wollongong City Council, 2009. Wollongong Local Environmental Plan 2009

Wollongong City Council, 2012. Wollongong 2022... Our Community Strategic Plan. Wollongong: Wollongong City Council.

Wright, I.A., Wright, S., Graham, K. & Burgin, S., 2011. Environmental protection and management: A water pollution case study within the Greater Blue Mountains World Heritage Area, Australia. *Land Use Policy*, 28, 353-360.