Integrating History and Ecological Thinking: Royal National Park in Historical Perspective

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This paper aims to develop an ecological history of Royal National Park. The socio-cultural context for the push to reserve such a large tract of land in perpetuity in 1879 includes the Park's early links to the Royal Zoological Society of NSW (formerly the Acclimatisation Society of NSW), in addition to a strong political movement advocating the reservation of open space in urban areas. A selection of maps of the Park situates it in a broader context. Previously unpublished data from 1879 to the present is evidence of increasing formal support for nature conservation and protected areas. Tim Flannery's contentious essay 'Beautiful Lies' (2003) is challenged on the issue of long-term fauna conservation in Australia's national parks. The paper concludes that using an ecological approach to interpreting historical data enables us to gain a clearer grasp of the reasons behind the changes to the Park's boundaries since 1879, the relationship between the Park and its fauna, and the challenges facing the Park as an urban park in the twenty-first century.

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KEYWORDS: acclimatisation movement, ecological history, environmental history, Royal National Park, Royal Zoological Society of NSW, Tim Flannery; urban park, Yellowstone National Park.

INTRODUCTION

Oliver Rackham is a scholar with an unusual bent. He is interested in ancient woodlands and has developed the area of woodland ecology as a branch of historical ecology, which he sees as both a science and a part of history (Rackham 2003: xviii). He points out that woodland ecology is a discipline that is still in its early stages of development. In the second edition of his striking book, *Ancient Woodland*, Rackham notes that new data have strengthened his conviction that ancient woods are all different, and that each has its own unique development. Given that Rackham (2003: 435) views Australia as a miniature planet and contends that its ecosystems work on different principles to the rest of the globe, one can quickly appreciate that, from a world perspective, Royal National Park is an international treasure richly deserving of its own ecological history. The Linnean Society symposium of 2011 was a major step toward achieving that goal, by examining the Park from a number of different interpretive positions (see e.g. Adam 2012; Attenbrow 2012; Schulz and Magarey 2012). This paper aims to further that endeavour by moving between history and ecology to arrive at a deeper understanding of the future challenges facing the park.

Ecological history is a rapidly growing field attracting considerable international attention. Drawing on existing fields such as environmental history (with which it is often synonymous) and historical geography, ecological history has been recognised as crucial to developing ecological restoration programs and conservation strategies (Foster 2000; Donlan and Martin 2004; Jackson and Hobbs 2009), in addition to deepening our understanding of the human impact on the natural environment (Flannery 1994). As an approach, ecological history seeks to integrate disparate disciplines, drawing not only from ecology and history, but also cultural studies (Goodall 2010; D'Arcy 2006) and archaeology (Hayashida 2005; Briggs et al. 2006), among other fields. Many works in the field adopt a grand-scale approach, examining ecological changes which have taken place over millennia in whole regions (e.g. Vermeij 1987; Flannery 2001; Grove and Rackham 2001). For more localised

studies, however, a small-scale approach is equally valuable in capturing the ecological specificities and changes in a given area. Although recognising that the history of Royal National Park – both ecological and cultural – did not begin with its dedication in 1879, this paper focuses on the decades following its dedication, which have been underexamined in the context of ecological history. In her captivating book, *The Colony*, historian Grace Karskens identifies that by the 1820s, the pattern of farming and grazing lands in New South Wales followed the funnel shape of the plain's arable soils. As a result, the rough sandstone country that encircled the plain was avoided. These once-shunned areas, she remarks, became Sydney's four treasured National Parks: Royal, Blue Mountains, Ku-ring- gai and Sydney Harbour. In Karskens' view, "their ecologies became the default 'Sydney ecologies'" (2009: 21). The landscapes of the arable soils, such as on the Cumberland Plain, and the rich alluvial flats, met a different fate: they are Sydney's "lost landscapes" (2009: 21). As Karskens recognises, the chance survival of a handful of areas has come to retrospectively structure our understanding of Sydney's pre-settlement natural environment as a whole. That Karskens highlights what has been lost suggests an awareness of the fact that what we have left, and the knowledge that can be gleaned from it, is necessarily incomplete.

There are many fascinating aspects of the ecological history of Royal National Park. Among these aspects is the meaning of 'national park' and what it meant in Australia in 1879 when what is now known as Royal National Park came into existence. Another is the place of the Park in coastal NSW and the Sydney region from a biologist's perspective. What is its vegetation, its fauna, and how do we manage this national park ecologically? A third area of interest is the location of the Park in relation to its immediate surroundings, and the implications of its location for the management of this larger unit of land. As an urban park, it is particularly important in the context of building public support for conservation initiatives. Developing a pro-conservation consensus among urban populations is a key challenge facing conservation organisations more generally, and promises to reward protected areas if achieved (Trzyna 2003). The location of the Park also poses specific challenges for its managers. As Conner (2003) argues, public awareness of the benefits of protected areas is particularly important with regard to urban parks. As such, he contends, managers need to promote their parks' natural and cultural heritage values and provide information to potential beneficiaries with a view to developing broader support for conservation among urban constituencies (Conner 2003).

While National Parks are always about the present, they are also about a sense of the past and the future. Without an examination of their history we cannot fully comprehend their development; without an eye on their future, they will not survive. For those who lack a sense of history, national parks and protected areas are an impediment to growth, wasted land which should be converted into something more useful. This view is manifest in so many areas of debate, whether concerning the river red gums on the Murray, the southeast woodchipped forests, or grazing in the high country, that we should never rest on the assumption that we have permanently made the case for a national parks system that meets all the ecological criteria that one can find, including how the parks and reserve system will fare in an era of climate change. The shining example of Royal National Park helps sustain that case. We might rest comfortably with the assumption that no-one will turn Royal National Park into a new set of suburbs, but we are far from sure that the remaining remnants of Sydney's pre-European vegetation will not be cleared for some development dream, a growth centre, infrastructure project or just incremental expansion of existing suburbs. That is their likely fate, but it ought not to be. To help project an image of a future Sydney that keeps as much of its biological heritage as possible, we should continue to point to Royal National Park. In 1879, it was a great idea, by 1979, at its centenary, it was a brilliant idea, and by 2079, it will be seen as a solid gold investment. Indeed, as the Trustees concluded in their *Official Guide to the National Park of New South Wales*, "It is Time, and Time alone, that will prove the vast value of this magnificent dowry to the people of New South Wales" (Elwell 1893:64).

We can now turn to some of the details of Royal National Park that might capture the attention of a future ecological historian who has the time to follow up any ideas and convert a tentative paper to a solid piece of scholarship. I might add that it is essential to publish such efforts: I know of too much material that is unpublished, and that is a tragedy for those with more than just a passing interest in Royal National Park, or indeed any other element of our natural environment. The importance of research and education concerning the natural history of Royal National Park become apparent when listening to people who have spent much of their lives studying and working in and around the Park. By 2079, these experts will have died, and as an important part of the Park's history it is necessary that we record this community's contribution while they are still active (see Appendix 1). A central theme of this paper is to

draw attention to the need to record the history of all our National Parks and Nature Reserves, and to place their history in an ecological context. It is a difficult and time-consuming task: it took some years for a group of us to record Nadgee Nature Reserve (Lunney et al. 2012), but these efforts will be invaluable in the coming decades.

'THE LUNGS OF THE CITY': A BRIEF HISTORY

The decision to reserve such a large tract of land merely 25 kilometres from the Sydney CBD must be contextualised within the increasing concerns for public health which preoccupied many of the educated elite of the nineteenth century. For an intellectual and political milieu that prized public hygiene, racial purity and vitality, Sydney's rapid population expansion presented critical problems for the future. The city's sanitation, overcrowding and pollution attracted growing criticism in the late 1870s, as a State Government enquiry into Sydney's health [1885-1877] blamed a high child mortality rate on inadequate procedures for sewage disposal. It was as a direct consequence of these concerns that urban reformer John Lucas addressed the Legislative Assembly on 19 February 1879:

"The health of the people should be one of the first objects of all good Governments, and to insure a healthy, and consequently a vigorous and intelligent community, it is necessary that all cities, towns, villages, and such other centres of populations, should possess parks and pleasure grounds as places of public recreation." (Anon., 1879a: 3)

Lucas proposed that a tract of land should be dedicated exclusively for the purpose of public recreation – literal "breathing room" – in all of Sydney's densely populated suburbs. In their reportage of Lucas' address, the *Sydney Morning Herald* clearly agreed. While noting that Sydney already had the Domain, "some small reserves" – such as Moore Park, dedicated in 1866 – and "a most noble harbour", it contended that these were insufficient: "With all those facilities for health we had a puny race of young people growing up in our midst". Lucas was especially preoccupied by the long-term effects of overcrowding and pollution on children, who lacked "sufficient fresh air to give them a healthy and vigorous constitution." As a result, he viewed the probable consequences of population expansion "with horror". In his view, the *Herald* reported, "unless provision were made for sanitary improvements, … the death rate would be ten times as much as it was in Sydney at the present time" (1879a: 3).

Despite the reservations of then Premier Henry Parkes, who concurred with the sentiment of Lucas' address but criticised its radical implications for land use policy, Lucas' resolution was unanimously passed in the Assembly the following month. His proposal sheds valuable light on one of the ways in which the natural environment was conceived at the time: as 'the city's lungs', the antithesis to the polluted urban centre of the modern age. Yet the reformers' preoccupation with population health was not the sole factor behind the dedication of Royal National Park in 1879. As Pettigrew and Lyons (1979) argue, one of the primary reasons for its reservation from sale was the need to provide land for the acclimatisation of foreign animals. The Parkes Government strongly approved of the aims of the Zoological Society of New South Wales (initially called the Acclimatisation Society), which formed a month after Lucas' address on 24 March 1879. The Society was committed to "the introduction and naturalisation of song-birds, and of animals suitable for game" (Anon. 1879b: 5). Two days after its first meeting, the *Sydney Morning Herald* reported that the Parkes Government, "in order to promote its objects, will set apart a large tract of land for the purpose of acclimatisation." It specified that "the proposed reserve is on the south side of Port Hacking, extending from the coast some five miles back, and is said to embrace about 80,000 acres" (Anon. 1879c: 5). On 29 March, the *Herald* described the area in greater detail and credited the idea to John Robertson, Vice-President of the Executive Council, "who has thought of the project for years" (Anon. 1879d: 3). 18,000 acres (7284ha) were formally dedicated on 26 April 1879. On the same day, eleven Trustees were appointed, including Lucas, Robertson, and the convenor of the Zoological Society, Walter Bradley.

That Lucas and Bradley were both appointed as Trustees points, to a certain extent, to the compatibility of their aims. Both men, and the groups they represented, viewed the natural environment within a utilitarian framework. Although today the effective cooperation of a zoological body and an urban development group is complicated by the former's conservation ethic, in the nineteenth century their objectives were far more complementary. Irrespective of their individual backgrounds as naturalists, urban reformers, and government officials, the first generation of Trustees shared an understanding of the National Park as a reserve which existed primarily for public use. Its central purpose was to provide a space for public recreation. Accordingly, the Trustees saw the 'beautification' and 'improvement' of the Park as high on their list of management priorities. Central

to this was the key problem of accessibility. Over the Park's first decade, the Trustees devoted the majority of their funding and effort toward the provision of access routes (Fig. 1). For some tenderers, clearing areas of the Park proved too great a challenge. As one tenderer, John Crowley, writes to his contractor in 1882: "I beg to inform you that I am reluctantly compelled to decline proceeding with the clearing portion of the National Park […] I am not surprised at having been deceived in my estimate of the work as the undergrowth of gum and appletree […] are all suckers growing from stumps of saplings and large trees that have been burnt level with the natural surface of the ground" (State Records NSW, Container No: 9/2188). Despite such setbacks, the 1893 *Guide* boasts that, during the Trust's first five years, "thirty-two miles of roads were cleared, and a considerable length was formed and finished for traffic." With the growing popularity of the Park as a "recreation resort", road construction operations were extended. "From that day to this," the *Guide* continues, "the work of road formation has been continued, and in the main, satisfactorily completed". The result is a network of "thoroughfares, now spreading web-like over the park" (Elwell 1893: 12-13).

These operations were applauded by the public. Although part of the Park's allure was that it had "remained so long unknown, unvisited, and unappropriated" – indeed, a "terra incognita" – it was considered inevitable that it would be "subdued to the hands of man" (Anon. 1879e: 4). As the *Sydney Morning Herald* commented: "In the main it is as little known and has been as little visited as if it had been 1000 miles away. The time has come for this solitude to be disturbed." In the reporter's estimation, this was "simply the rescue from neglect of a beautiful piece of wild country, and bringing it forth for the enjoyment of man" (Anon. 1879e: 4). Tellingly, the enthusiastic public response to the decision to reserve the Park in March 1879 was strongly linked to the expectation

Fig. 1. Audley Road, National Park (Government Printing Office, 1888). Photograph courtesy of the National Library of Australia (Digital Collection; Call Number 'PIC/8476/13 LOC Album 1037').

that it would accelerate the planning for the long-awaited Illawarra railway line. With this means of transportation, the park would be "a sanctuary for the pale-faced Sydneyites, fleeing the pollution, physical, mental and social, of that densely packed city." [quoted in Pettigrew & Lyons (1979) but no source cited. M. Maack (2002) attributes quote to John Robertson; "NSW Confederation Conservation History", The Bushwalker, Vol. 28, No. 1 (August 2002), p. 3].

The 1887 Deed of Grant formalised the Trustees' responsibility to the public. It empowered the Trustees "to use and permit to be used the said lands as a National Park for the recreation of the inhabitants of the said colony" and specified the Park's legitimate uses. These included "ornamental plantations of lawns and gardens", "zoological gardens", an "artillery range" and the "exercise and encampment of military or naval forces" (N.S.W. 1891: 3). The rest and recreation of the public were high on the list of priorities (Fig. 2). In alignment with the broader utilitarian philosophy which underscored the management of the Park, the Deed clarifies that the Park's natural resources are subservient to public need. It continues:

"…it shall be lawful for the Trustees of the National Park to grant licenses to mine upon and under the said land for and to take away and dispose of, as the licensees may think fit, all coal, lime, stone, clay, brick, earth or other mineral (excepting gold or silver) that may be found in the said lands." (1891: 4)

In her work-in-progress, entitled *European history of Royal National Park revisited*, Judith Carrick examines the history of attempts to mine the Park in more depth than can be explored here (Carrick, in press: 18-20). For our purposes, it is illuminating to note that the dominant conception of the Park as a space for public use coexisted in relative harmony with a deep appreciation of its perceived beauty. There seems to have been little concern, for example, when the Park's tableland was extensively cleared in

Fig. 2. Unknown boy on banks of river, National Park (Charles Bayliss, ca. 1880-1900). Photograph courtesy of the National Library of Australia (Digital Collection; Call Number 'PIC/7985/164 LOC Album 100').

Fig. 3. Encampment Ground, Loftus Heights (Government Printing Office, 1888). Photograph courtesy of the National Library of Australia (Digital Collection; Call Number 'PIC/8476/11 LOC Album 1037').

1884 for use by the military (Fig. 3). That this was considered a routine matter of management and not environmental degradation points to the historical specificity of the naturalists' relationship to the fauna and flora which they studied with fervour. However, despite these disturbances the Park retains many of its biodiversity values (Adam 2012; Schulz & Ransom 2010; King 2013) and continues to meet contemporary criteria for designation as a National Park.

POINTS OF CONVERGENCE: THE ZOOLOGICAL SOCIETY OF NSW

To a twenty-first century ecologist, the attitudes and priorities of the nineteenth-century naturalists seem bizarre. Particularly incomprehensible is the Zoological Society's interest in the acclimatisation of foreign species at a time when native fauna and flora had not yet received comprehensive legislative protection. Indeed, the first statute enacted in NSW addressing the issue of fauna protection, the *Animals Protection Act* of 1879, listed as its primary purpose the "importation and breeding" of alien species. The protection of native fauna (the list of which includes no mammals) rated second – and only applied "during the breeding season" (N.S.W. 1879: 56).

This stipulation reflects the acclimatisation movement's selective approach to the issue of preservation more generally. It supported the protection of certain native fauna on the basis of its utility. As Pettigrew and Lyons (1979: 18) argue, its proponents believed that the contemporary rates of exploitation had to be regulated not for conservation purposes, but to ensure that there remained sufficient populations for future generations to exploit. Furthermore, although it was largely comprised of naturalists passionate about the natural environment, the acclimatisation

movement was, from the vantage-point of the contemporary conservationist, quite arrogant: it believed it could 'improve' nature. Few saw anything problematic in this objective; on the contrary, many were drawn to it by a sense of boundless possibility. As the *Sydney Morning Herald* commented, "It is difficult to set limits to the attractiveness which this fortunate national reserve may be made to possess" (Anon. 1879e: 4).

This conception of the Park, and of the fauna and flora within its shifting boundaries, persisted well into the twentieth century. The *Official Guide* of 1914, for example, is redolent with references to 'beautification', and boasts of the successful introduction of multiple non-indigenous species, including trout and perch. Yet the *Guide* hints at an introduction which would prove a headache: that of deer at Gundamaian. By 1886, the Trustees had acquired seven fallow deer, some white angora goats, and five valuable red deer through donation. According to the 1893 *Guide*, they thrived and rapidly multiplied (Elwell 1893: 13). A special Deer Park was established to house the deer near the Port Hacking River (Fig. 4), and more deer were later purchased. Yet, as the *Guide* records, "for them nine-wired fences did not a prison make. […] these ruminants broke bounds, and are now roaming, fancy free, over the wide domain" (Elwell 1893: 54). As early as 1893, Carrick notes, there was a complaint about deer escaping and destroying a neighbouring garden. By 1912, the Trust refused an offer of more deer, and by 1923 the Trust was attempting to 'donate' them to other parks. The management of deer, particularly the Javan rusa, remains a most difficult issue to this day (Keith and Pellow 2005).

Gundamaian was also home to the Scientists' Cabin. According to Carrick, the Cabin was built in 1924 for the Zoological Society, although Allen Keast remembers that it "had formerly housed the timber

Fig. 4. Fountain cottage and the fountain at the Deer Park, Port Hacking River (Government Printing Office, 1888). Photograph courtesy of the National Library of Australia (Digital Collection; Call Number 'PIC/8476/4 LOC Album 1037').

workers" engaged in logging operations before the Society occupied it in the "late 1920s" (Keast 1995a: 28). It was in the vicinity of the sawmill by the Hacking River, just above the Upper Causeway. During its time there, the Society conducted valuable research into the native birds of the Park, particularly the bower-bird. The Society was granted sole use of the cabin, but was given notice to leave in 1935 because it could not agree to the new terms of the permissive occupancy. Carrick notes that records show that the Society was still there in 1941. Concerning the eviction of the Zoological Society, Keast bitterly recalls that "the end of the Cabin came ignominiously about 1944 when most members of the Society were absent at the war: it was pilfered bit-by-bit for seaside cottages on the adjacent Park beaches" (1995a: 29).

Another interesting point of convergence between the Park and the Zoological Society is the push within both for the addition of the prefix 'Royal' to their titles. As public recognition of their value grew, so did their stature. To the management of both the Park and the Society, the insertion of 'Royal' would suitably reflect their growing importance in the eyes of the public. By 1908, almost 30 years after its formation, the Society had risen in prominence to the extent that its President, Dr. T.P. Anderson-Stuart, sought permission to add the 'Royal' prefix to the name. A Royal Charter was duly granted in September 1908. On 10 February 1909, the Society changed its name to 'The Royal Zoological Society of New South Wales'. Three decades later, the Trustees of the National Park discussed renaming it to Royal National Park, while other parks (namely, Ku-ring-gai) would be National Parks. For the Park, it was the visit of Queen Elizabeth II in 1954 which would prove to be decisive: the Park was renamed in 1955.

The addition of 'Royal' can be interpreted as both a political and cultural statement. It is distinctively British, it carries certain class overtones, and it was a fashion statement which the Royal Easter Show, Royal Society for the Prevention of Cruelty to Animals (RSPCA) and the Royal Flying Doctor Service also reflect. Its connotations raise the question of exactly which sectors of colonial society were to benefit from the dedication of the National Park in 1879. It is indeed far from clear as to whether the National Park was dedicated for the poor of the inner suburbs for health and recreation, or for a more privileged group that could consider importing and releasing exotic species, the very ones we now call alien invasive species. One should read the press release and accompanying documents with a critical eye. For historians, there is some digging to do here, particularly concerning the meaning of 'national'. Carrick, for example, argues that the word 'national' denoted, in 1848, the inclusion of all individuals in a locality irrespective of denomination and social standing. In view of this, one could reasonably extrapolate that, in 1879, the National Park was dedicated for all inhabitants of the colony. At the very least, it was certainly understood this way: the *Sydney Morning Herald*, for example, makes few references to Sydneysiders when speaking of the Park's use, preferring inclusive language such as "the people of the whole colony" and "the people of this country" (Anon. 1879d: 3; Anon. 1879e: 4).

On a related note, it is difficult to discern whether John Robertson was inspired by a foreign model when he created Royal National Park – and if so, which one. There is certainly some merit to the claim that the isolated Yellowstone would be an odd model for a park located so close to the inner city (Pettigrew and Lyons 1979). It is more likely that if Robertson had a model, it was London's recently established common parks, located on the border of the metropolis, though this is in need of further research. In Carrick's view, the links between the American trajectory and developments in Australia are ambiguous and in need of more probing study. In my perspective, the debate over which national park was first in the world - Yellowstone in 1872, or our local candidate - is distracting. It is more productive to examine the claims to originality critically and within their political context, as Robin (2012) has done in an intelligent paper. The ecological ideas of the 1870s (not, of course, conceived in twenty-first century ecological terms), are equally interesting. Their echoes are still present in NSW, whether the current public debate centres on marine parks, mining under the parks (such as the coal seam gas proposals for the Pilliga forests in north-western NSW), or hunting on public lands.

MAPPING ROYAL NATIONAL PARK

We live in a tenure-bound society. Maps are a manifestation of our preoccupation with boundaries, and of our specific relationship to the natural environment, although they have a long history of use in navigation. They are today so commonplace that it is difficult to grasp their initial novelty. The early maps of Royal National Park were among the first in Australia of a natural area enclosed by a boundary for the sake of demarcating an area considered to be purely natural. Until these maps were designed, natural history in Australia did not have set boundaries within which the natural environment could be managed. The mapping of Royal National Park fundamentally challenged the dominant exploitative approach to the land as a place

to be colonised, cleared, and farmed. It gave emphasis to an emergent perspective of the natural environment which was not primarily valued in commercial terms and which was beginning to recognise, by the late nineteenth century, that forests could not be exploited in an unregulated manner (Lunney & Moon 2012). That this was a public area owned and managed by the State in perpetuity remains one of the great landmarks in world nature conservation. Royal National Park initiated the integration of nature study with the management of natural areas. In so doing, it made an extensive part of New South Wales' pre-settlement environment accessible to a large number of people who otherwise may not have come into contact with some of the most beautiful specimens of Australian fauna and flora in their natural settings.

For these reasons, it is worth turning our attention to the maps of Royal National Park. Many observations can be gleaned from examining the maps in sequence and in context of the surrounding areas. In what follows, I examine a series of maps chronologically in order to draw out some of the factors which have contributed to the dedication of the Park, and to illustrate the changes in the Park's boundaries and management over time.

The earliest map of the area of relevance to this study is dated 1845, and depicts the "country southward of Sydney, shewing the Road lately opened through it to the Illawarra" (Fig. 5). Operationally speaking, this road came to define the Park's boundaries, prefiguring the western border of the Park. That there were no roads in this area prior to 1845 can be seen as evidence that the land was of little commercial value: in comparison to the arable soil of the Cumberland Plain, for example, the land which was later to comprise Royal National Park had not been opened up for grazing crops or farming estates. Consistent with this, the map shows a clear absence of landscape differentiation, with no references to ownership. Indeed, it resembles more an explorer's map than the careful result of a set of surveyor's decisions. As Surveyor-General, Thomas Mitchell (whose signature appears at the bottom of the map) would have well understood the importance of tenure boundaries as a reflection of political and administrative decisions regarding land use. The absence of tenure boundaries on this map points to the fact that, in 1845, there had been no decisions made on the potential use of this area of undifferentiated Australian bush. Instead, it had escaped 57 years of colonisation without being surveyed and considered for agricultural and commercial use. With Sydney growing in a pattern that fitted the arable lands, it was a chance of geography, soil fertility, and the ready access to more productive landscapes that allowed the future Park area to remain 'unused' (in a contemporary land use sense) until 1879. Consistent with this, in the earliest existing parish map of Wattamolla – undated, but appraised to have been constructed between 1835 and 1870 – the sentence "barren land destitute of timber" was inscribed across what we now know as Royal National Park (Fig. 6). This phrase remained in subsequent maps lithographed in the early 1870s (Figs. 7-8). This indicates that, for successive governments, this land had been surveyed and had no commercial value.

In contrast to the 1845 map, a map of the Park dated 1879 (Fig. 9) displays clear tenure boundaries in the typical block fashion, with the leaseholders' names printed neatly on their respective portions (a close-up of this part of the map is provided in Fig. 10). This map was found by Allan Fox "crumpled in the corner of a room" in Royal National Park in the late 1970s, when Fox was helping to assemble information for the celebration of the Park's centenary. Fox states he found it "in a pile of rubbish to be thrown out" (pers. comm, 2013). The land which it depicts is representative of the original boundary which became the area dedicated in 1879 in three parts: the first on the 26th of April, the second on the 6th of October, and the third on the 25th of November (NSW Government Gazette 1879b, 1879c, 1879d). The upper left-hand corner of the map states that it is a "tracing shewing National Park &c., County of Cumberland". Although the map does not provide the name of the surveyor, it resembles an official document, perhaps prepared in readiness for the Park's dedication that year. Given the pencil marks on the map, it has the appearance of a working map. Interestingly, the words "Reserve from sale pending selection of railway line" cover a large area on the Park's western boundary which would later be excised (see below). Most importantly, however, the tenure boundaries of this map provide us with a timeframe within which to assess the changing management of this area of land. They show us that, between 1845 and 1879, decisions were being made on its potential use. What in 1845 had no formal land use designation was beginning to be dissected in 1879 for other uses. In view of this, it becomes clear that had the decision not been made to dedicate the area as a National Park, the vast majority of this land would have been cut up into private holdings by the turn of the century.

The gazettal notice of 26 April 1879 states that 18,000 acres were dedicated and gives a detailed written description of the boundary (NSW Government Gazette 1879b). We have used contemporary GIS technology to draw the boundary according to this original description. The calculated area stands at

Fig. 5. 'Country southward of Sydney, shewing the road lately opened through it to the Illawarra'. Sydney: Thomas Mitchell, 1845. Map reproduced courtesy of the Mitchell Library, State Library of New South Wales. Call number 'Cb 84/18'.

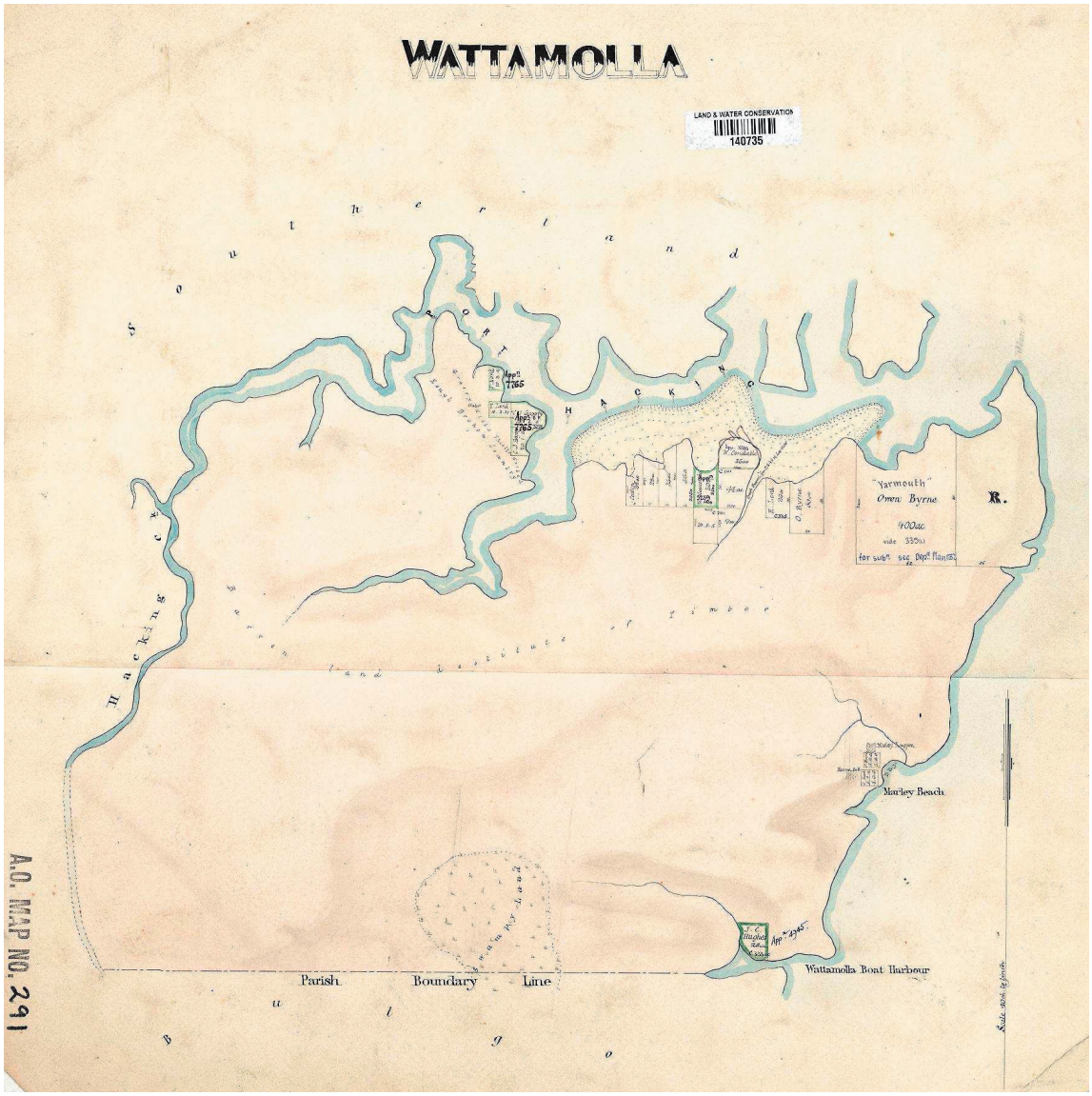


Fig. 6. Wattamolla parish map. Circa 1835-1870. Map reproduced with permission of the NSW Lands and Property Information, Department of Finance and Services, Panorama Ave., Bathurst 2795.

19,541 acres (7908 ha) and forms the basis of a new map, shown in Fig. 11. According to the gazettal notice of 3 August 1880, the Park was expanded on this date by 19,000 acres (NSW Government Gazette 1880). Again following the gazettal description, we used GIS technology to calculate the total area to be 36,532 acres (14,784 ha) and the actual area is depicted in Fig. 11. This largely – though, as we will see, not completely – forms the basis of what is now known as Royal National Park. The addition in 1880 is in the eastern half and incorporates the land which is shown in Fig. 10. It appears that the allotments shown in Fig. 10 were mining leases (as indicated by the initials 'ML' in the corner of each portion), leading us to assume that either the terms of the lease had lapsed by 1880, or that the approval for mining had been withdrawn. The absorption of these allotments may thus shed light on the early Trustees' relationship to mining in the Park: as Mosley (2012:35) has suggested, John Robertson and his supporters may have gone to great lengths to protect the Park from this threat.

For our purposes, it is interesting to note that the Park was still being surveyed at this time at Robertson's request (State Records NSW, Container No: 9/2188). In June 1879 a representative of the Department of Lands, PT Adams, opined that "on survey considerable modification of the present boundaries will be found necessary", and argued that "natural

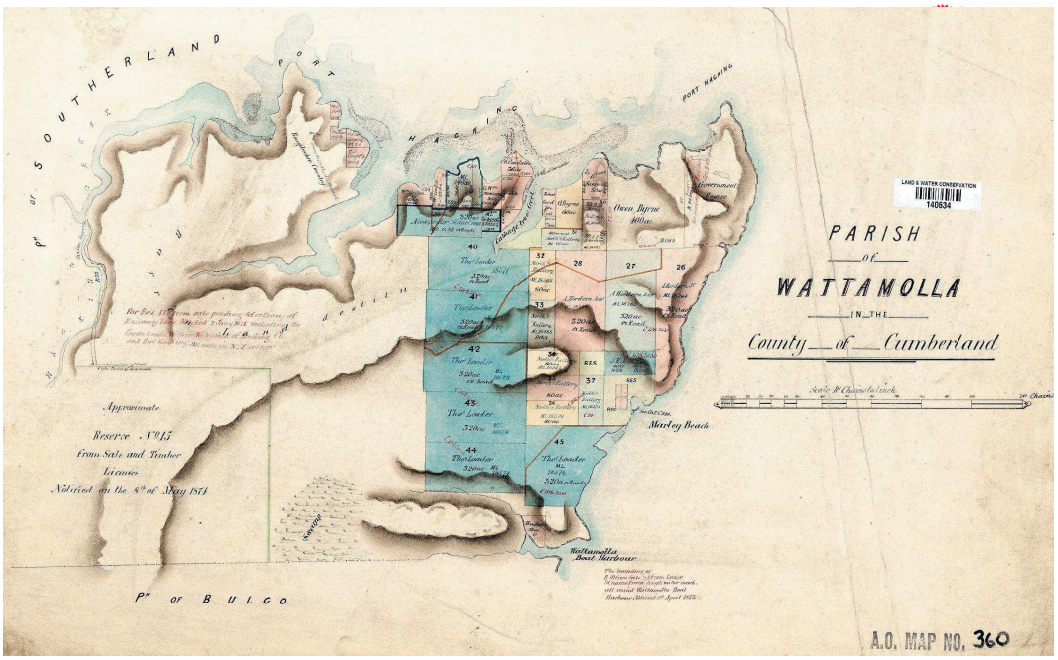


Fig. 7. 'Parish of Wattamolla in the County of Cumberland'. Circa 1873-1874. Map reproduced with permission of the NSW Lands and Property Information, Department of Finance and Services.

Fig. 8. 'Parish of Wattamolla in the County of Cumberland'. Circa 1880-1882. Map reproduced with permission of the NSW Lands and Property Information, Department of Finance and Services, Panorama Ave., Bathurst 2795.

Fig. 9. 'Tracing shewing National Park &c., County of Cumberland, New South Wales, 1879.' Unpublished map. Reproduced courtesy of Allan Fox.

Fig. 10. Tenure boundaries (detail), 1879. Image taken from Fig. 9. Unpublished map. Reproduced courtesy of Allan Fox.

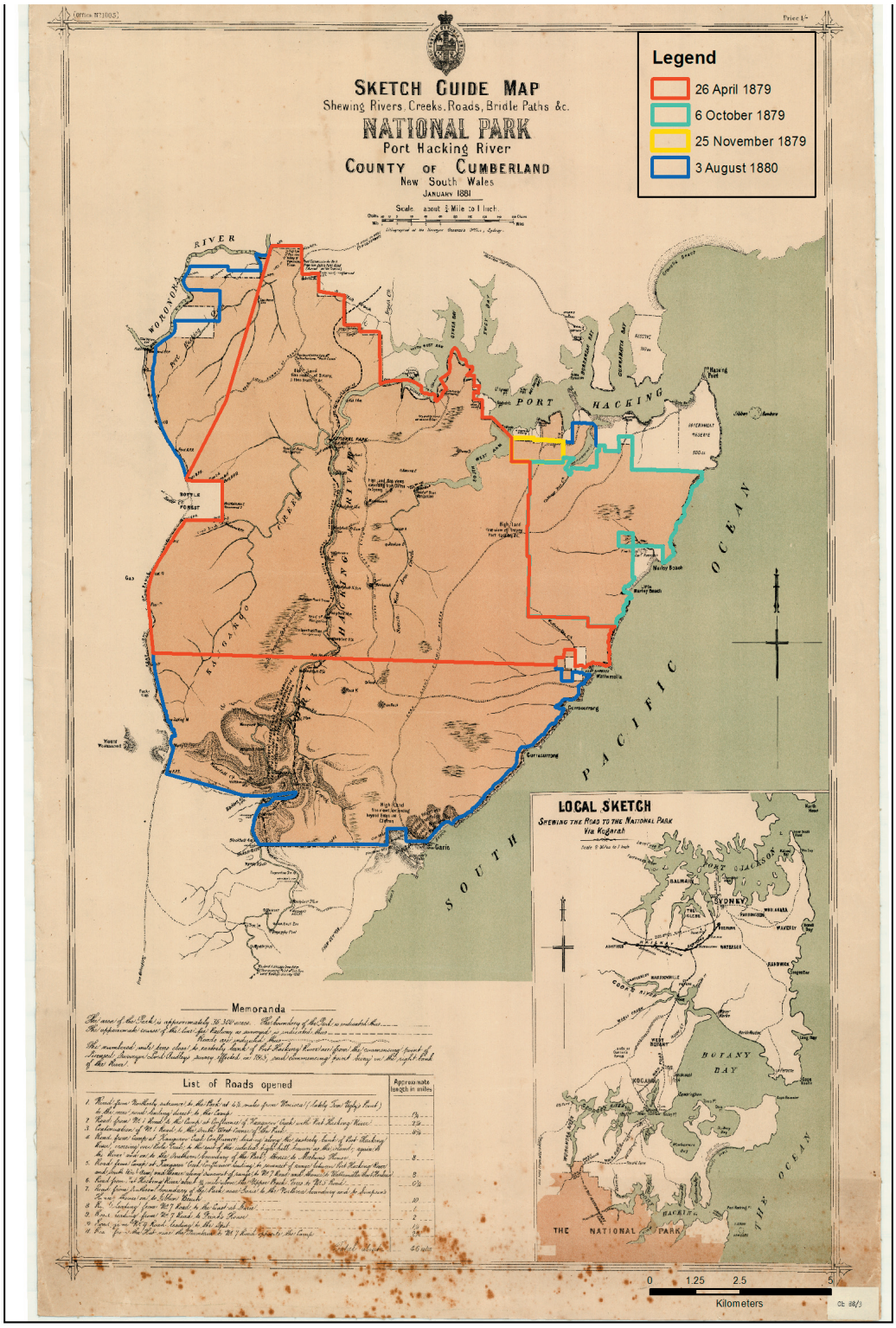


Fig. 11. Map showing incremental additions to Royal National Park from 26 April 1879 – 3 August 1880. This map uses the 1881 map in Fig. 12 as a base to show the boundaries of the successive increments over this period. The land bounded by the red line is the initial dedication of 26 April 1879. The green line shows the addition of 6 October 1879. The yellow line shows the addition of 25 November 1879. The land within the boundary of the Park which falls outside these lines was gazetted on 3 August 1880. This map was constructed using GIS to map the written descriptions in the gazettal notices of the four dates listed above. This approach allowed an accurate determination of the total area of each increment.

features should be substituted when the [sic] exist for arbitrary lines" (State Records NSW, Container No: 9/2188). In January 1881, a "sketch guide map shewing rivers, creeks, roads, bridle paths &c" in the newly dedicated National Park was lithographed at the Surveyor General's Office in Sydney (Fig. 12). When placed alongside the 1879 map, this map clearly illustrates the expanded boundary of the Park. In the 1881 map, the Park has absorbed the private holdings depicted in Fig. 7. Moreover, the information at the bottom of the map states that the "area of the park is approximately 36,000 acres" (Fig. 12). This is double the figure given in the Government Gazette for the Park's size in 1879, noted as "18,000 acres" (NSW Government Gazette, 1879a, 1879b). With a series of acquisitions (NSW Government Gazette 1880), the Park's southern boundary now roughly followed a line between Garie Beach and what later became Waterfall. Given that there existed no precedent for determining the boundaries of National Parks, it is understandable that the area doubled so early on, as competing uses of the land may have been resolved in the early years of the Park's administration. However, it is remarkable that this considerable expansion has largely gone unnoticed in the existing histories of the Park. These early changes to the Park's boundaries are worthy of a separate study, as deeper examination of how and why they occurred may shed light on the colonial administration's understanding of the Park in its earliest years. For our immediate purposes, however, it suffices to note that the fluidity of the Park's boundary in its early decades reflects the fluidity of the concept of a 'National Park' at this juncture. While we repeatedly cite 1879 as the pivotal year of dedication, it is in actuality only the first stage in the Park's history, and is representative not of a final boundary, but of an initial area set to greatly expand.

An official map dated 1897 (Fig. 13) provides us with another point of departure in examining the developmental history of the Park. Interestingly, this map appears to be identical to a map dated 1893 and published as part of the *Official Guide* (Elwell, 1893). The map clearly depicts the location of the Illawarra railway line in the area which was marked 'reserved from sale' in Fig. 9. Furthermore, the area west of the railway line is shown to remain within the Park's boundary. This was not to last long, however: as the politician and editor Andrew Garran presciently noted in 1886, "though it may remain a wild preserve, the railway will soon bring the long line of southern suburbs close up to its edge" (Garran 1974 [1886]: 98). The NSW Government Gazette of 26 August 1903 confirmed his prediction, declaring the intentions of the Governor, "with the advice of the Executive Council of [NSW]", to "wholly revoke the said dedications and grant in so far as they apply to or affect the said areas of 36 acres, 54 acres, 5 acres, 13 acres and 2 roods, 2 acres and 2 roods, and 2,950 acres of land described in the Schedule hereto" (NSW Government Gazette 1903: 6293-6294). A total of 3,060 acres was excised from the Park's western boundary. The Park's new boundary is shown in an official map produced in 1904 (Fig. 14). Interestingly, it appears that this map was a personal copy owned by the architect and conservationist Myles J. Dunphy, who was later to become known for his tireless efforts to protect key areas of the Blue Mountains. The 1904 map states that the area of the Park is now 33,719 acres – down from 36,320 in 1897. According to Carrick, the Park's Trustees agreed to a proposal made in 1895 by the Lands Department to withdraw this area, and received Jibbon Reserve (shown in Fig. 13 to be excluded from the Park) in exchange (Carrick, in press: 7). This is consistent with Carrick's contention that a "symbiotic relationship" existed between the Trustees and the Department of Railways "from the beginning" (Carrick, in press: 42), and is worthy of further research in a future study.

These maps illustrate considerable changes to the Park's boundaries in its early decades. Yet, although these changes are directly observable when represented visually, they are often discussed in the aggregate in existing literature. This has confused our understanding of the historical development of the Park. For the purposes of clarifying this development, a number of graphs and tables were prepared for this paper. Cathy Johnson of the Reserve Establishment and Land Information Section (OEH) prepared a spreadsheet tracking the 37 additions to Royal National Park over the period 1 October 1967 - 11 March 2005, increasing the park size from 14,851.94 ha on 1 October 1967 to its current size of 15,091.7173 ha (Table 1). Appendix 2 provides a crucial context for appreciating the information provided in Table 1. It shows the date of dedication, initial area, and area modifications of all of the National Parks and Nature Reserves in NSW prior to the *National Parks and Wildlife Act* 1967. While accessible, the information provided in this appendix is extremely difficult to locate and, to the author's knowledge, has not been reproduced. It is appended here as a benefit to scholars. While providing area information in two or more decimal places may seem too fastidious, precision is vital in view of the vulnerability of Australian parks and reserves more generally. There is the issue, however, of whether the surveys were sufficiently accurate to justify this many decimal places. As we have now established that, in 1879, the figure of 18,000 acres

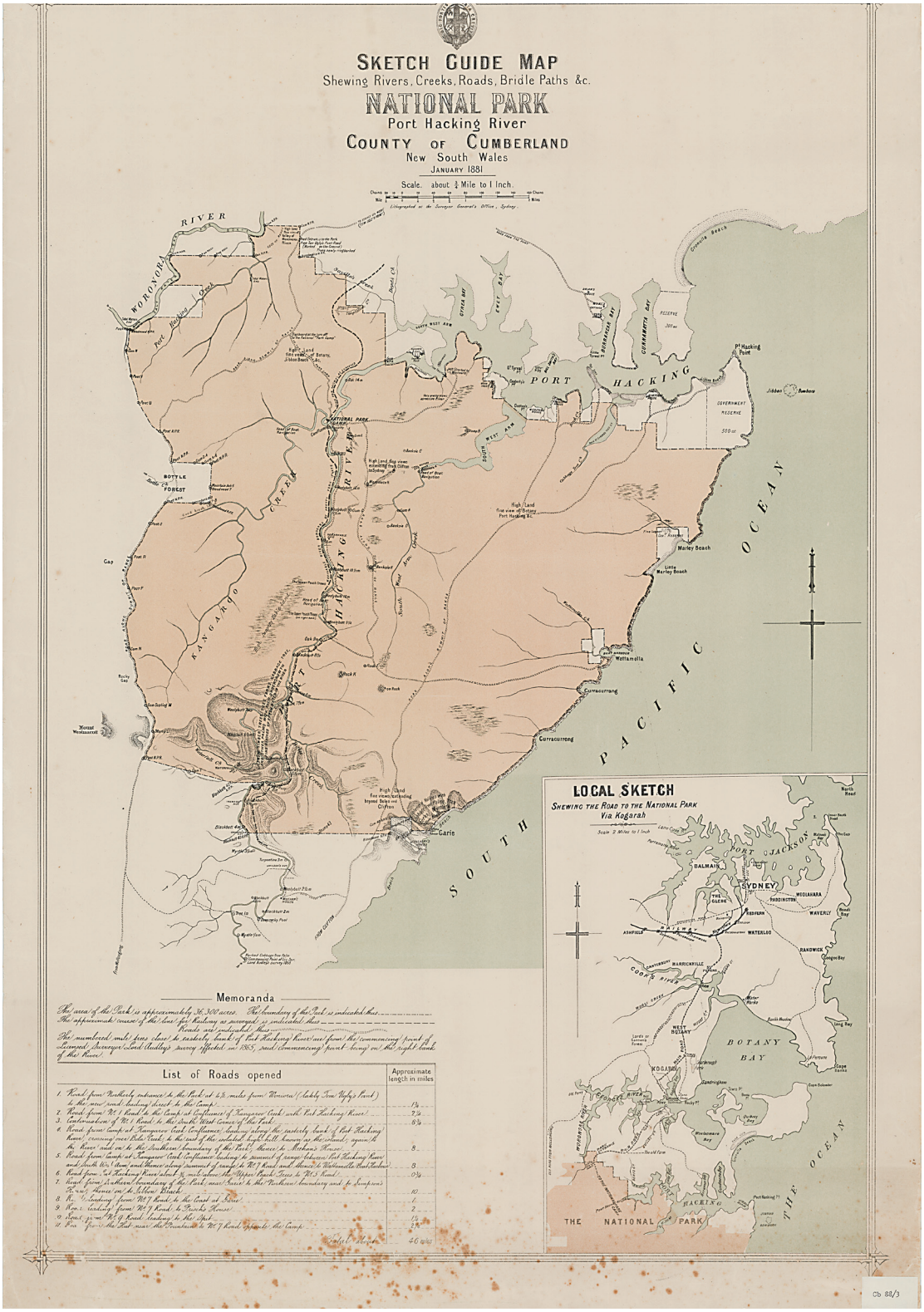


Fig. 12. 'Sketch Guide Map shewing Rivers, Creeks, Roads, Bridle Paths, &c. National Park. Port Hacking River, County of Cumberland, New South Wales.' Sydney, New South Wales: Surveyor General's Office, January 1881. Map reproduced courtesy of the Mitchell Library, State Library of New South Wales. Call number 'Z/Cb 88/3'.

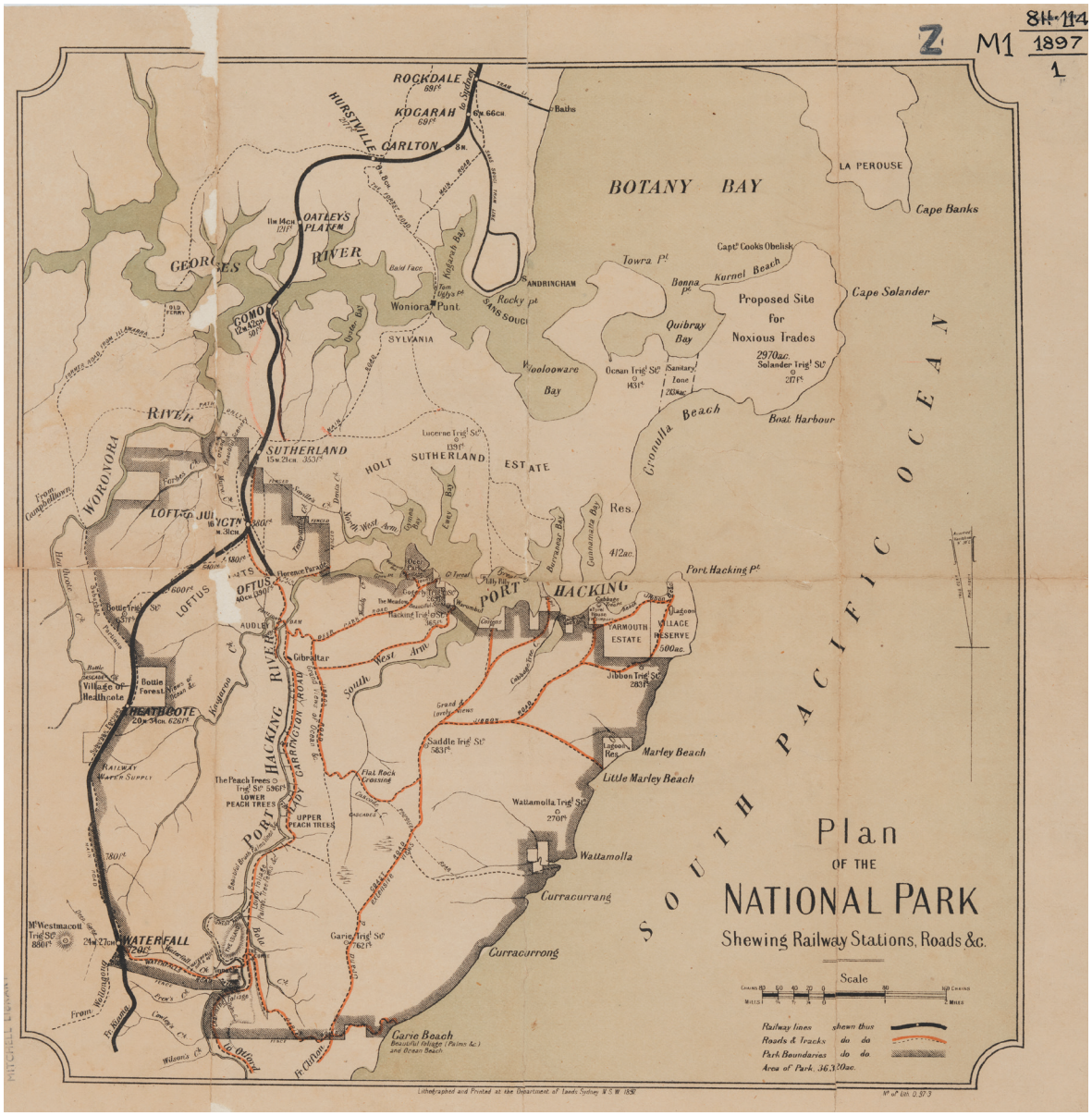


Fig. 13. 'Plan of the National Park: shewing Railway Stations, Roads, &c.' Sydney, New South Wales: Department of Lands, 1897. Map reproduced courtesy of the Mitchell Library, State Library of New South Wales. Call number 'Z/M1 811.114/1897/1'.

was simply a close approximation, what is at issue now are the incremental additions and revocations to Royal National Park, as shown in Table 1 and Fig. 15. We can reasonably assume that, since 1967, any further changes were mapped with a higher level of accuracy and thereby provide interested parties with clear and precise information. Furthermore, in view of these standards, this paper adopts the current reporting level of accuracy.

From an historical viewpoint, the records do not begin at OEH, or the National Parks and Wildlife Service [NPWS], before October 1967 when the *National Parks and Wildlife Act 1967* was passed and the NPWS established. The *National Parks and Wildlife Act 1974* replaced the earlier Act, and is the current Act under which Royal, and indeed all the National Parks and Nature Reserves in NSW, are acquired and managed. Mike Prentice (also of the Reserve Establishment and Land Information Section) and Cathy Johnson kindly helped me to isolate the specific additions to and excisions from the Park. Their data were used to construct a series of maps, which illustrate the changing boundary of the Park from 1879-2011 (Figs 16a-h). As these maps are

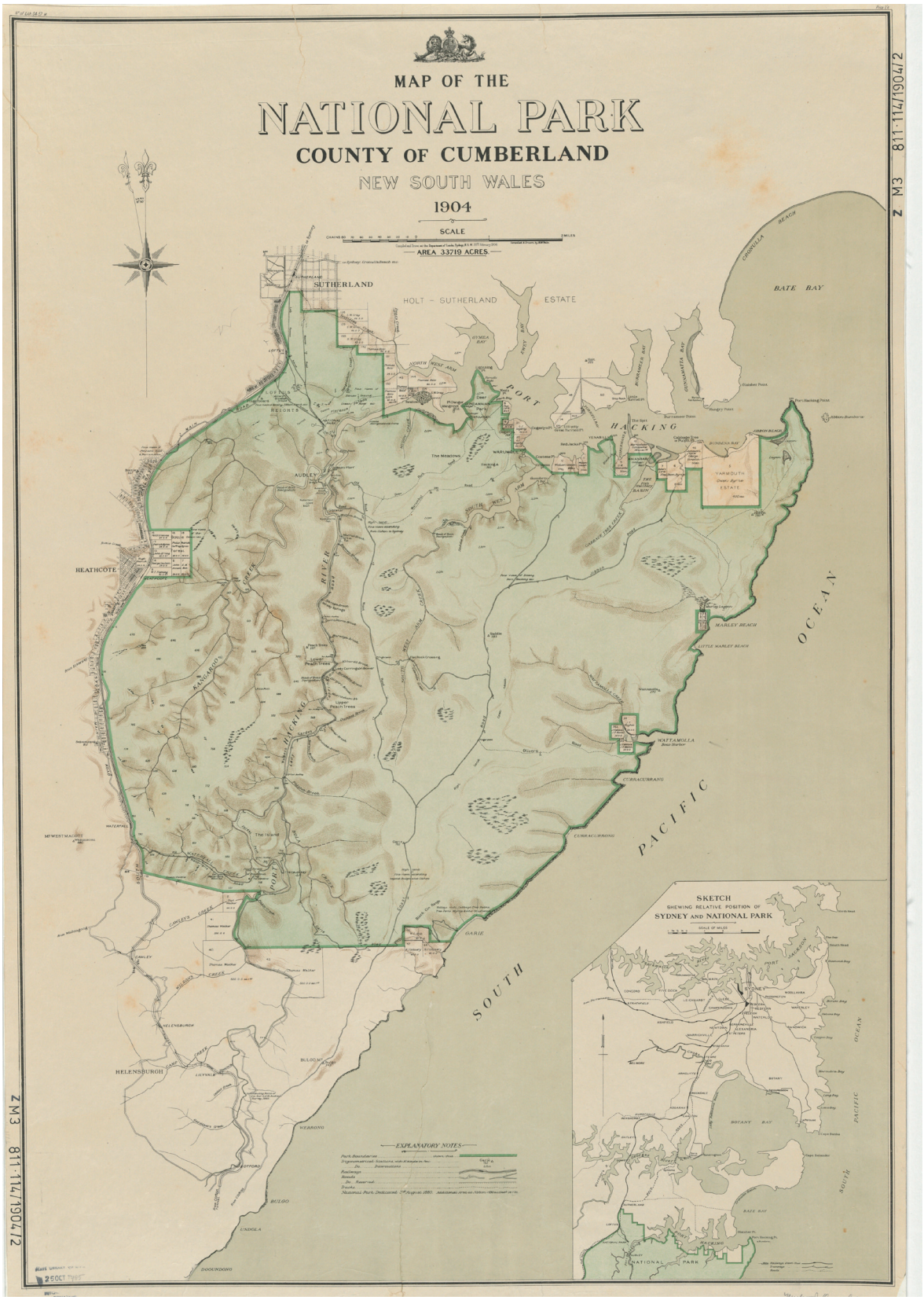


Fig. 14. 'Map of the National Park, County of Cumberland, New South Wales'. Sydney, New South Wales: Department of Lands, 1904. Map reproduced courtesy of the Mitchell Library, State Library of New South Wales. Call number 'Z/M3 811.114/1904/2'

Table 1. Additions to Royal National Park, 1 October 1967 – 11 March 2005. Credit: Cathy Johnson (Reserve Establishment and Land Information Section, OEH).

Legend	Date	Area (ha)
-	01-Oct-1967	14,851.94*
A-1	06-Dec-1968	19.24
-	13-Dec-1968	0.29
-	06-Jun-1969	0.13
-	05-Dec-1969	0.29
-	05-Dec-1969	0.51
A-7	08-May-1970	8.77
-	08-May-1970	0.14
A-9	24-Dec-1970	4.9852
-	24-Dec-1970	0.15
A-11	28-Jan-1972	3.98
A-12	04-Feb-1972	6.48
-	13-Oct-1972	0.18
A-14	28-Sep-1973	5.49
A-15	07-Dec-1973	2.73
-	31-May-1974	0.65
A-17	29-Nov-1974	5.82
A-18	19-Mar-1976	26.30
A-19	08-Oct-1976	6.48
A-20	17-Nov-1978	28.83
A-22	28-Dec-1979	47.60
A-23	23-Oct-1981	7.48
A-24	21-Jan-1983	2.13
-	18-Feb-1983	0.26
-	23-Dec-1983	0.59
-	06-Jun-1986	0.18
-	11-Sep-1987	0.17
A-30	26-Feb-1988	2.33
A-31	18-Mar-1988	3.28
A-32	03-Feb-1989	3.48
A-33	15-Dec-1989	45.00
A-34	25-Jul-1997	11.41
-	01-Dec-2000	0.42
A-36	11-Mar-2005	11.31

consistent in scale and visual presentation, they are provided as a supplement to the original maps, which can be difficult to compare.

Drawing upon all available data for all Parks and Nature Reserves in NSW, a detailed graphical presentation of the growth of the Parks and Reserves system from its inception in 1879 to the present (30 June 2012) is shown in Fig. 17. These graphs place the maps of Royal National Park in the historical context of growing support for the dedication of Parks and Reserves in NSW. The standard way of displaying the Parks and Reserves in NSW is in map form, meaning that unless one compares one map to another, the growth pattern is not easily discernible. Furthermore, unless one digs through the Gazette records, their growth in area is not apparent, especially when the growth in a given period is comprised of a series of modest increments. The regular mapping of the distribution of Parks and Reserves in NSW has missed the value of the pattern of numerical growth over time. These graphs were prepared specifically to overcome this deficiency in existing scholarship, and represent a new contribution to our understanding of the Parks and Reserves system in NSW. The data which were used to construct these graphs is provided in Appendix 3.

There are many points that can be made from the documents provided in this section. By examining the sequence and the dates, it is remarkable that such a large area was explicitly named as a National Park in 1879. There had been many small parks set aside in and around Sydney for recreation and health, but nothing near the size of Royal National Park at that time. It then becomes surprising that the area doubled in size so quickly: indeed, it has grown, with the additions of the adjacent Heathcote and Garawarra expanding the conservation estate. The growth of the Park in recent decades parallels the growth of the National Parks estate across NSW. Interpreting the earliest additions to the Park's boundary is complex, however: it is possible that they reflect growing support for the Park, and lobbying by special interest groups such as the Acclimatisation Society.

When a series of other maps are set next to these documents, further features emerge that help explain why the Park area remained Crown land in 1879. The maps in Benson and Howell (1990: 8) and Keast (1995b) depict the area as sandstone plateau country unsuitable for farming. Thus, it was a chance of geography that left the area intact for the 91 years since the European settlement of Sydney. However, it would not have been there in 1967 when the first National Parks and Wildlife Act came into force. Early timing was thus crucial in its dedication. The issue of timing, the importance of Crown lands, and the role of government attitudes have all been recognised as factors which determine the acquisition of national parks and nature reserves. This recognition largely grew out of the Fauna Protection Panel in the 1950 and 1960s and, after 1967, the NSW National Parks and Wildlife Service. Exactly which of these factors took precedence in the acquisition of National Parks in twentieth-century NSW was the subject of a debate

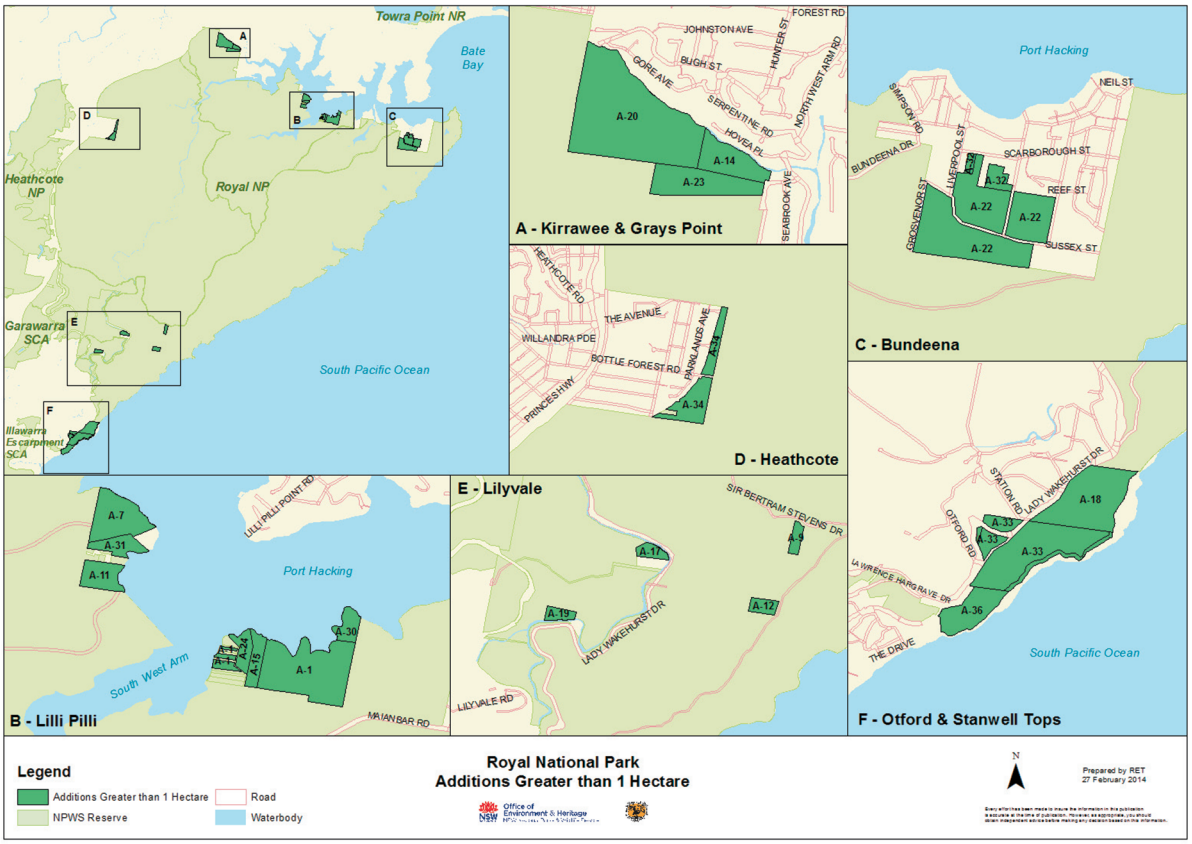


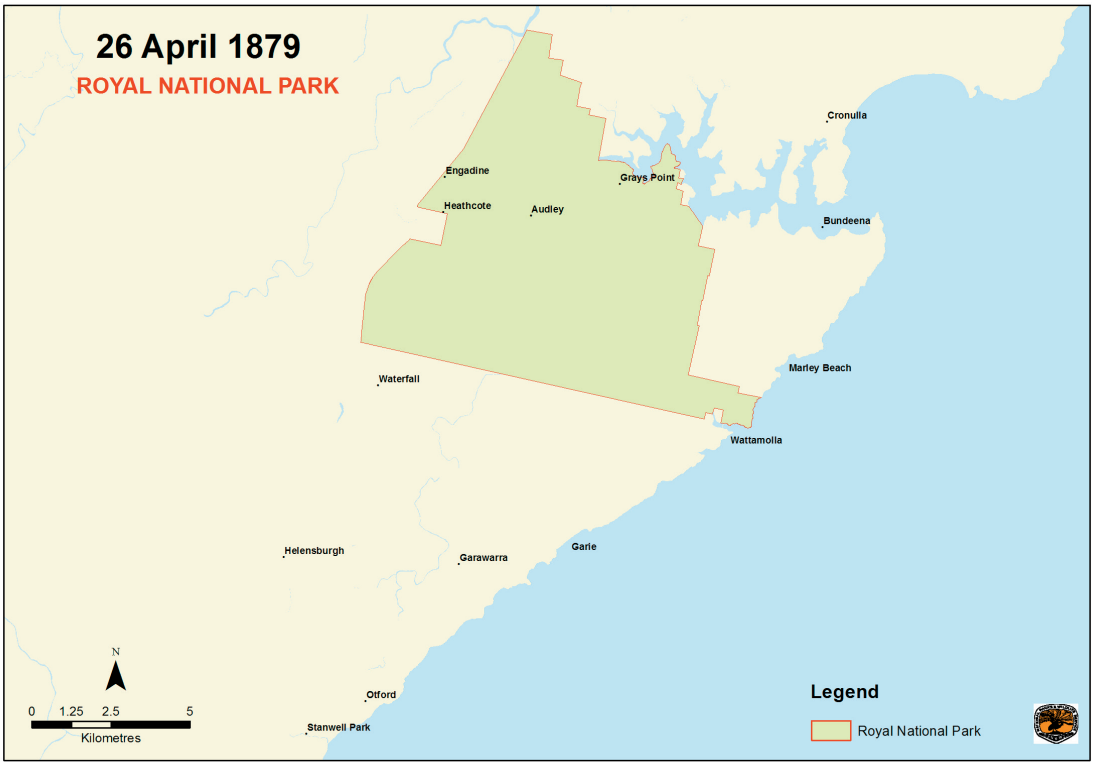
Fig. 15. Additions to Royal National Park greater than one hectare, 1967-2005. This map was produced by Cathy Johnson (Reserve Establishment and Land Information Section, OEH) specifically for this paper. For the data to which it refers, see Table 1.

in 1990 in the *Australian Zoologist* (McMichael 1990; Pressey 1990; Reed 1990; Specht 1990; Starling 1990; Whitehouse 1990a,b). For so many areas, the decades between World War II and the turn of the century held the last chance to dedicate large new parks and reserves, and it remains one of the feats of foresight and action that we have such a magnificent set of national parks and nature reserves in NSW.

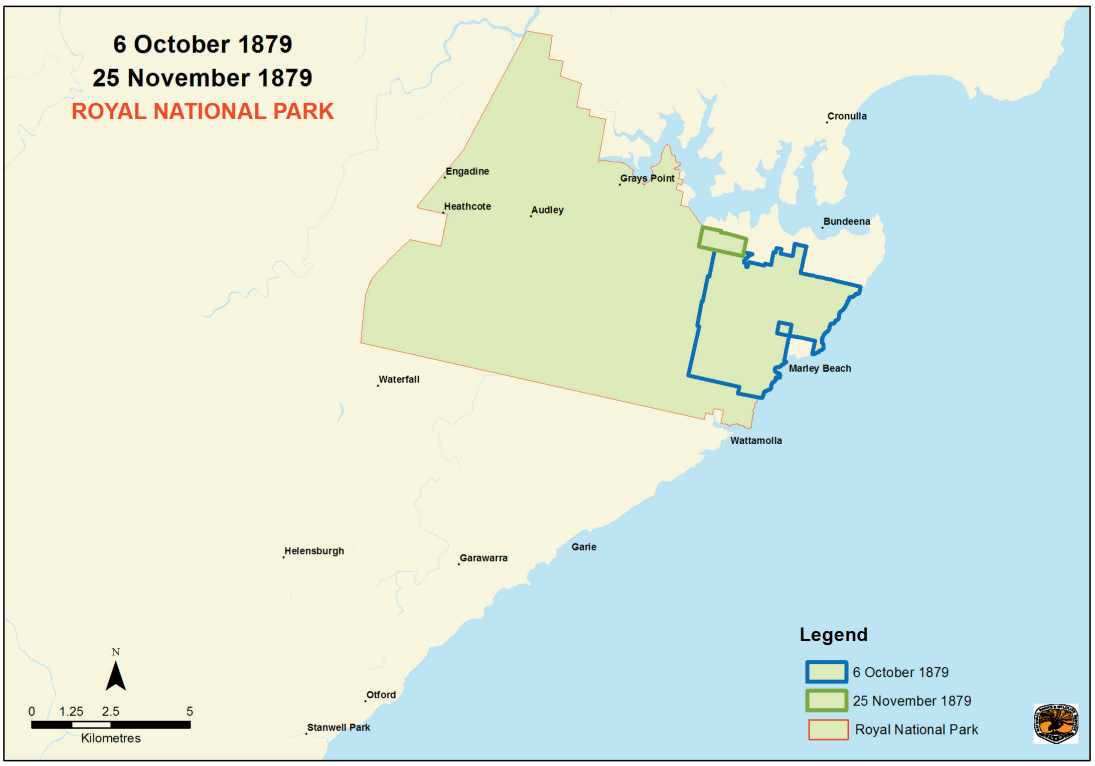
FAUNA AND HISTORY

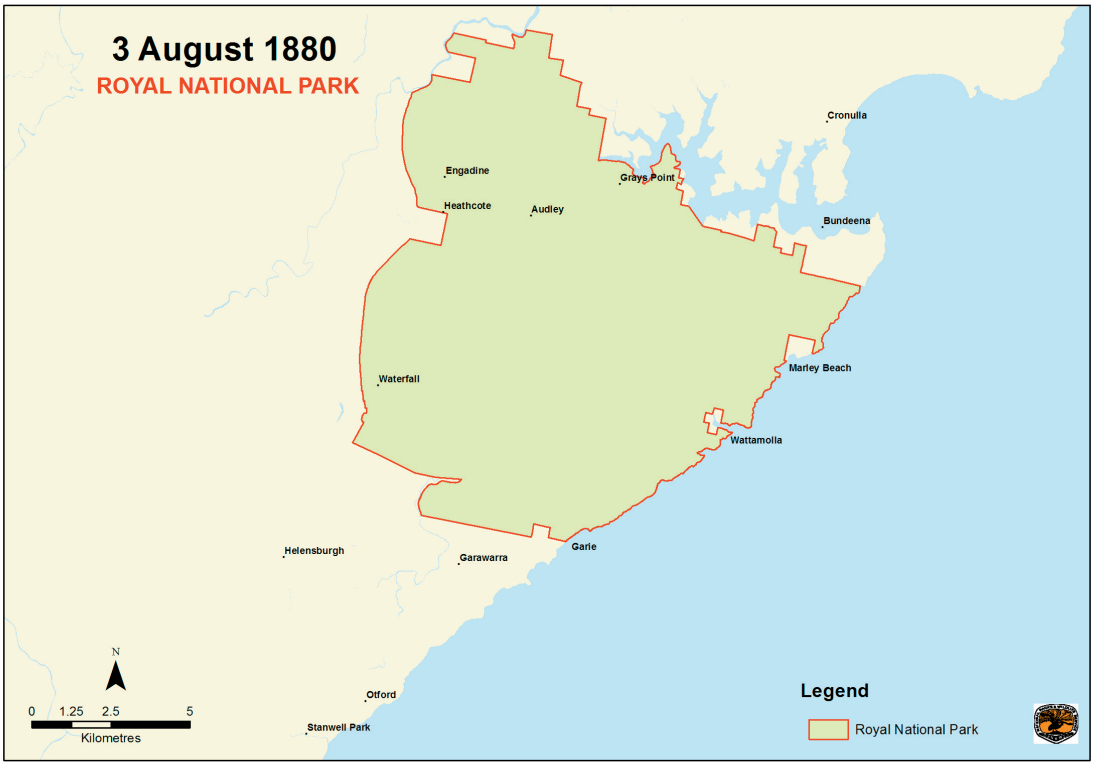
In the *Official Guide to the National Park of New South Wales (Elwell* 1893), the Trustees also comment on the history of Royal National Park in relation to its fauna. The Trustees credit themselves with making great strides in fauna conservation, as a direct consequence of preventative by-laws which prohibit

Figs 16a-h (next 4 pages). The changing outline of Royal National Park from 1879-2011. Comparing the maps allows us to discern a number of changes to the Park's boundaries over time: most significantly, a large excision from the Park in its north-west corner (indicated by colouring the excised land grey), and a steady expansion of the Park's area. The names of key places are provided for reference purposes. Fig. 16a shows the outline at 26 April 1879. Fig. 16b shows the outline on 6 October 1879, after an addition to the Park. Fig. 16c shows the Park's boundary in 1881. Fig. 16d shows the Park's boundary in 1904, with the grey area representing an excision from the Park's area since 1881. Fig. 16e shows the outline in 1967, when Royal became part of the NSW National Parks and Wildlife Service. It also shows the area of Heathcote National Park, which was dedicated in 1963. Fig. 16f shows the additions to Royal National Park between 1968-1979. Fig. 16g shows the additions to Royal between 1980-1999 and the location of both Heathcote National Park and Garrawarra State Conservation Area. Fig. 16h shows the current (at 30 June 2012) boundary of Royal National Park, which had been established by 2000. These maps were produced by Cathy Johnson (Reserve Establishment and Land Information Section, OEH) specifically for this paper.



16 a above, 16 b below





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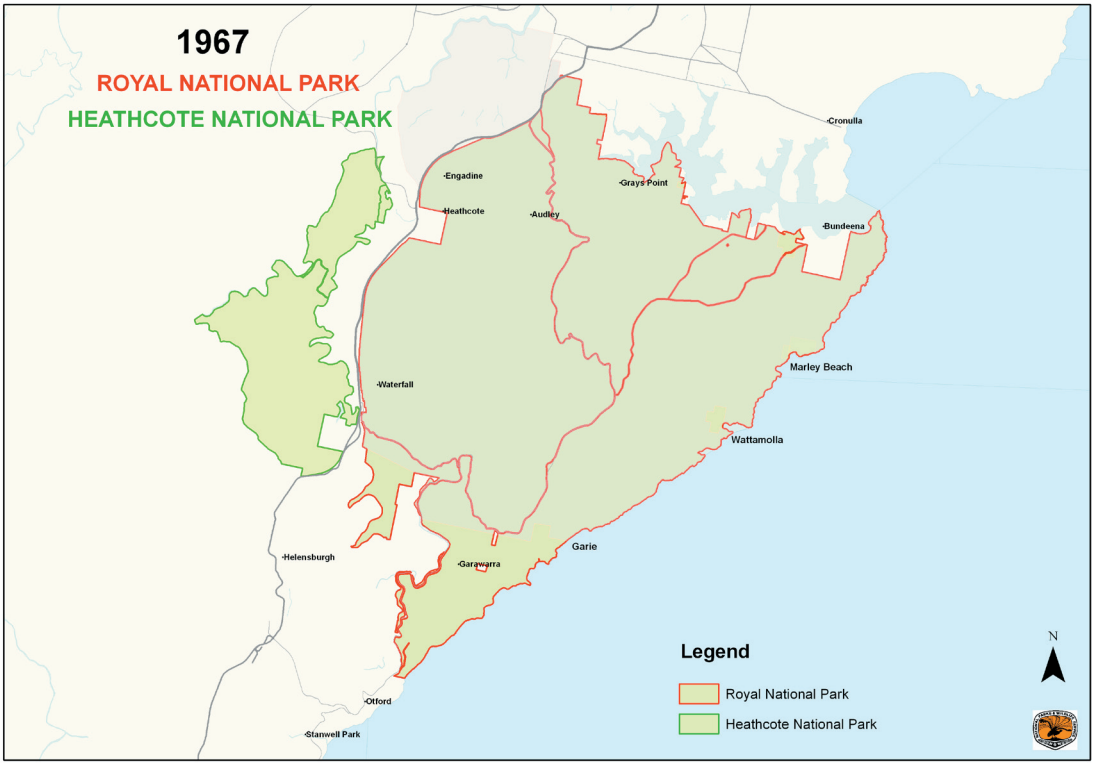

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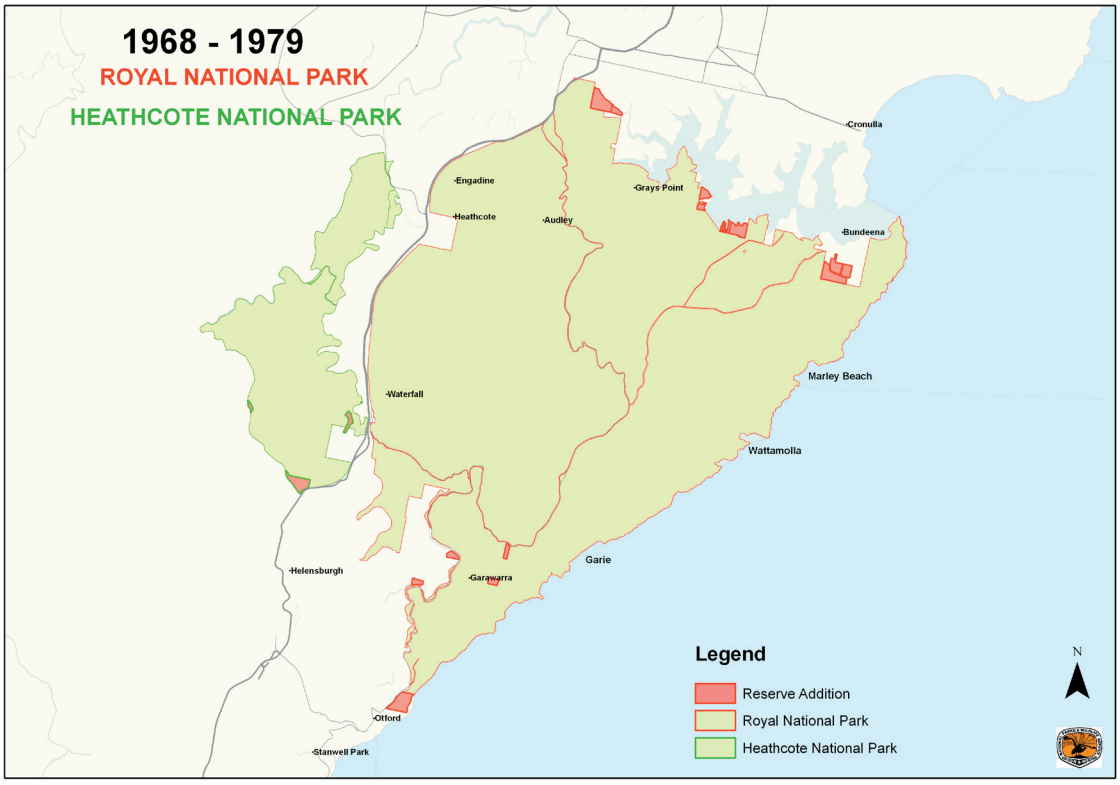

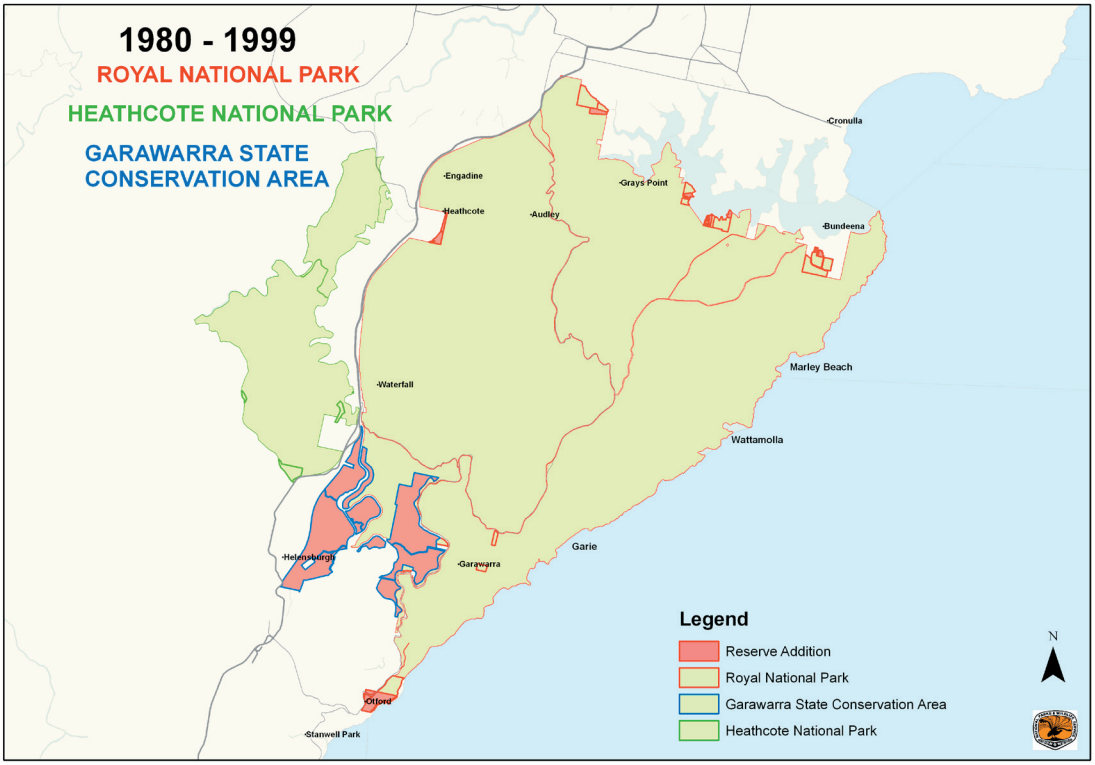

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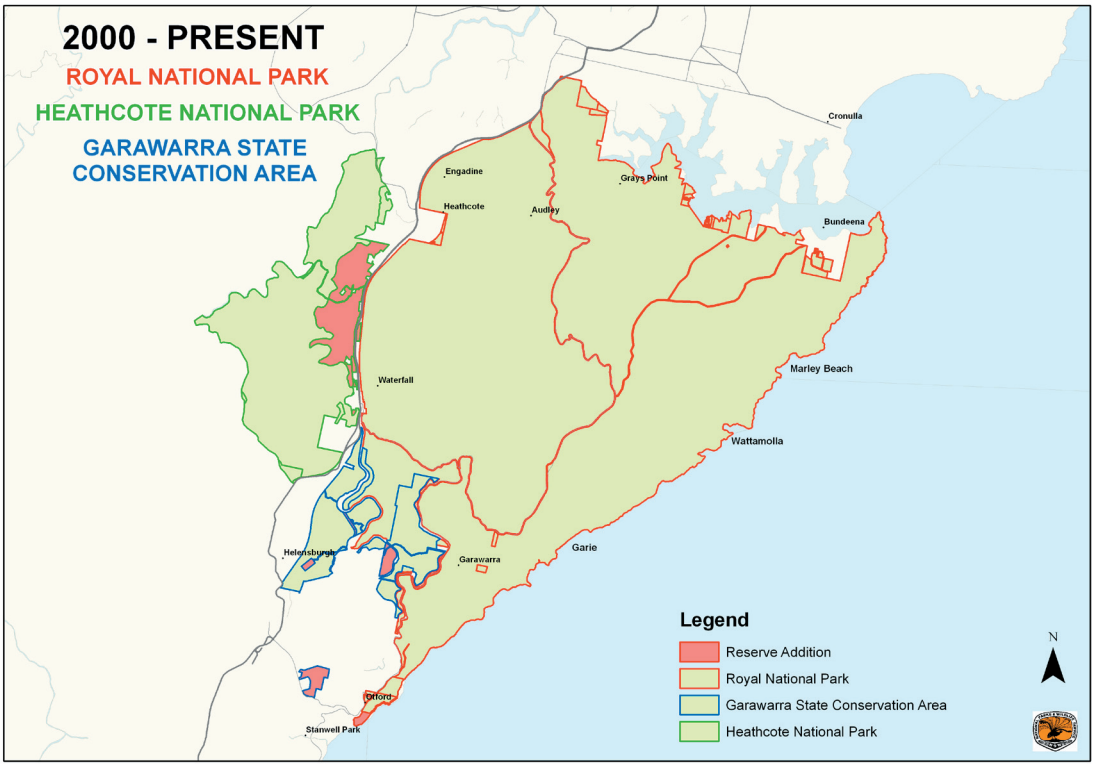
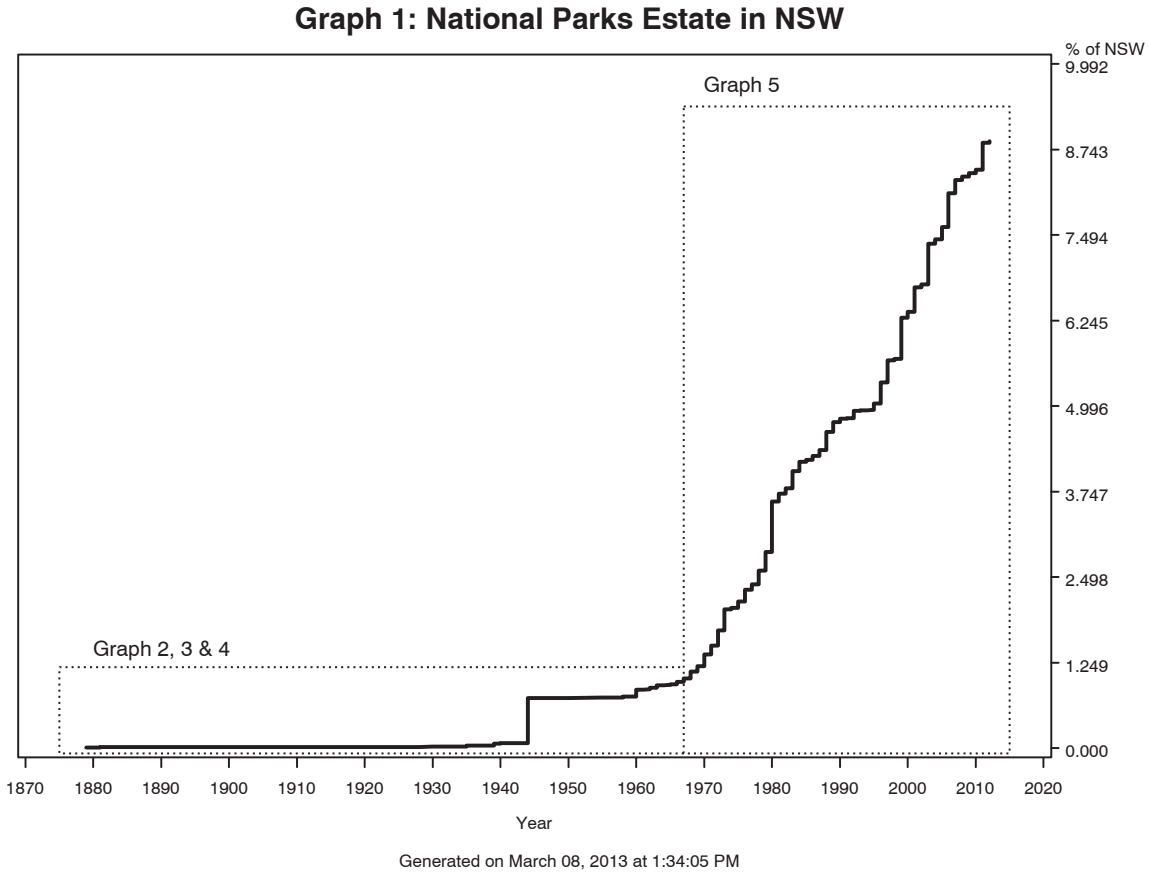
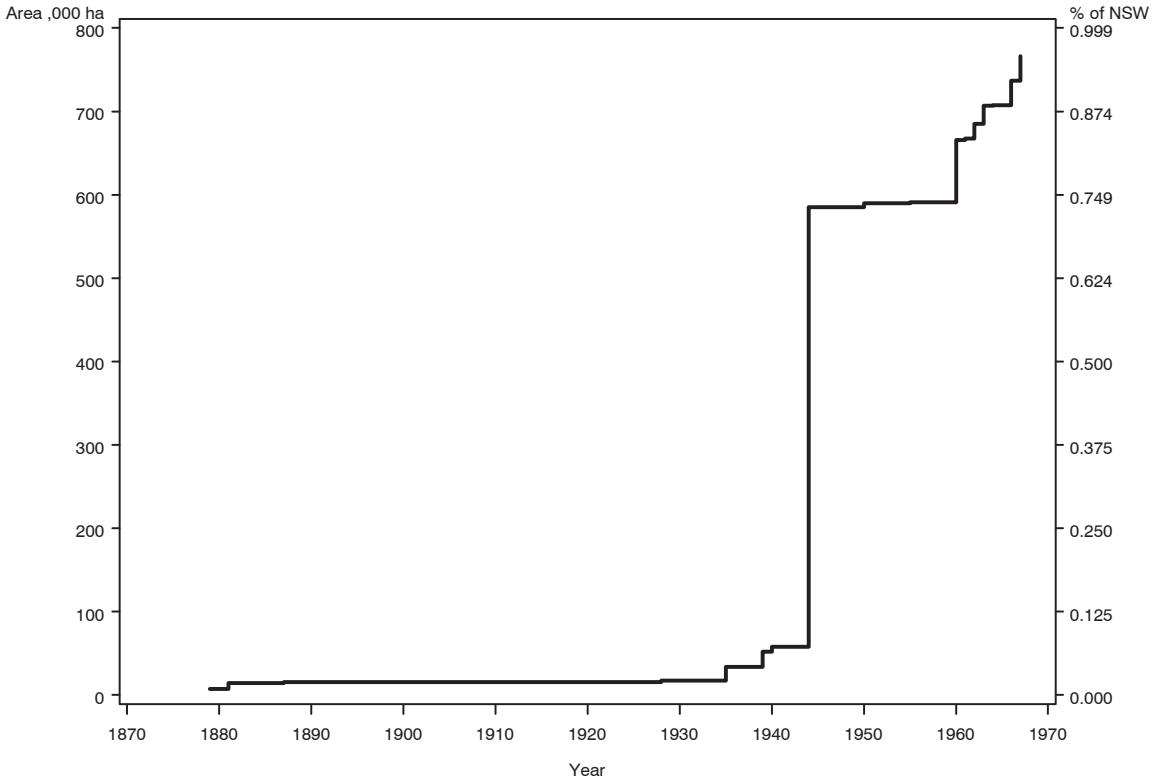


Fig. 17 (next 3 pages). The growth of NSW National Parks and Nature Reserves from the dedication of Royal National Park in 1879 to the end of the 2011-12 financial year.

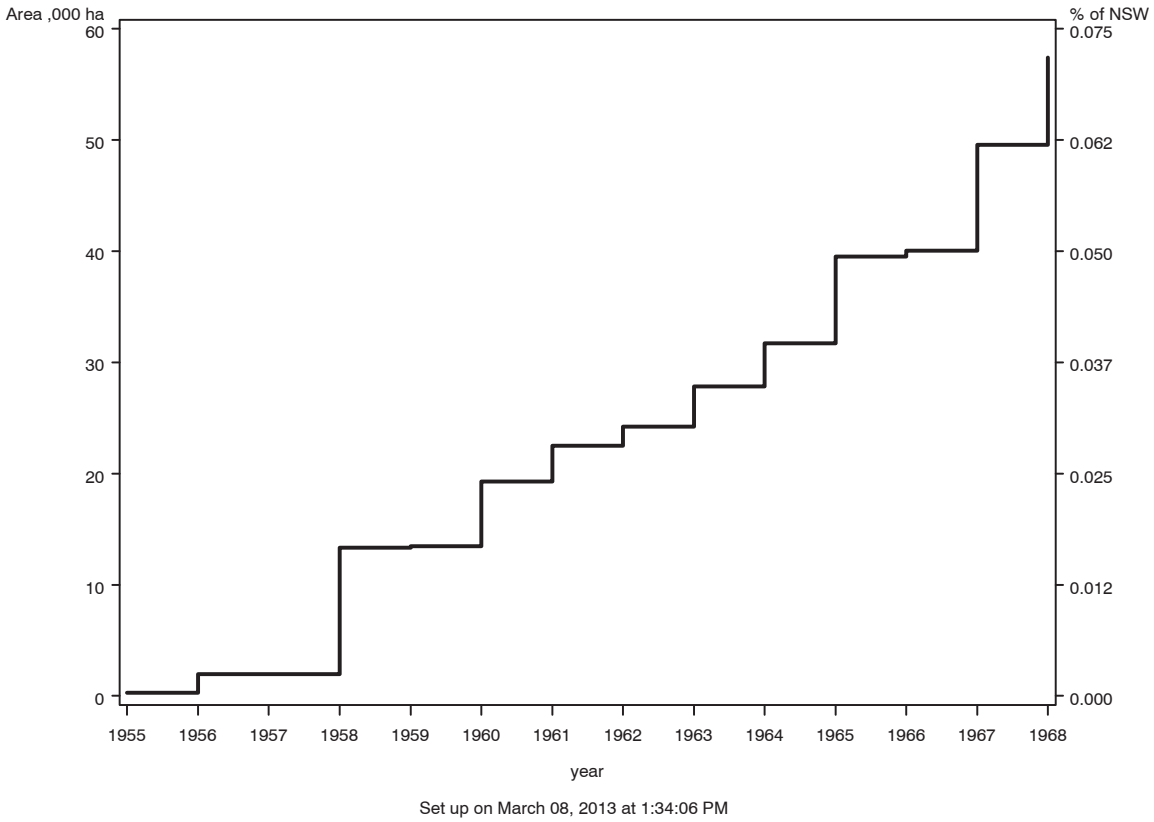
Fig. 17 has been produced as a series of graphs, numbered 1-5. Graph 1 provides a context for the four subsequent graphs, which have been constructed using the same data but are produced on different scales corresponding to the area involved. Graph 2 shows the area of National Parks from 1879 until the formation of the NSW National Parks and Wildlife Service in 1967, which integrated the selection and management of National Parks and Nature Reserves into one organisation. Note that the scale has been adjusted from Graph 1 to show more detail, in accordance with the smaller areas of National Parks prior to 1967. Graph 3 shows the area of Nature Reserves from 1955-1967, dedicated under the *Fauna Protection Act* 1948. Graph 4 shows Graphs 2-3 combined. Graph 5 shows the growth of both National Parks and Nature Reserves in the period 1967-2012. In Graphs 2-5, one vertical axis shows area and the other shows the percentage of NSW that is dedicated as National Parks and Nature Reserves. These graphs are original. While the information to construct the 1897-1967 graphs is formally available, it is difficult to locate. However, we were able to construct these graphs due to the expert help of Mike Prentice and Cathy Johnson of the Reserve Establishment and Land Information Section (OEH), where meticulous records are kept. The details of the dates and area of dedication of National Parks and Nature Reserves prior to 1967 is given in Appendix 2. These are presented here to provide easy access to these data.



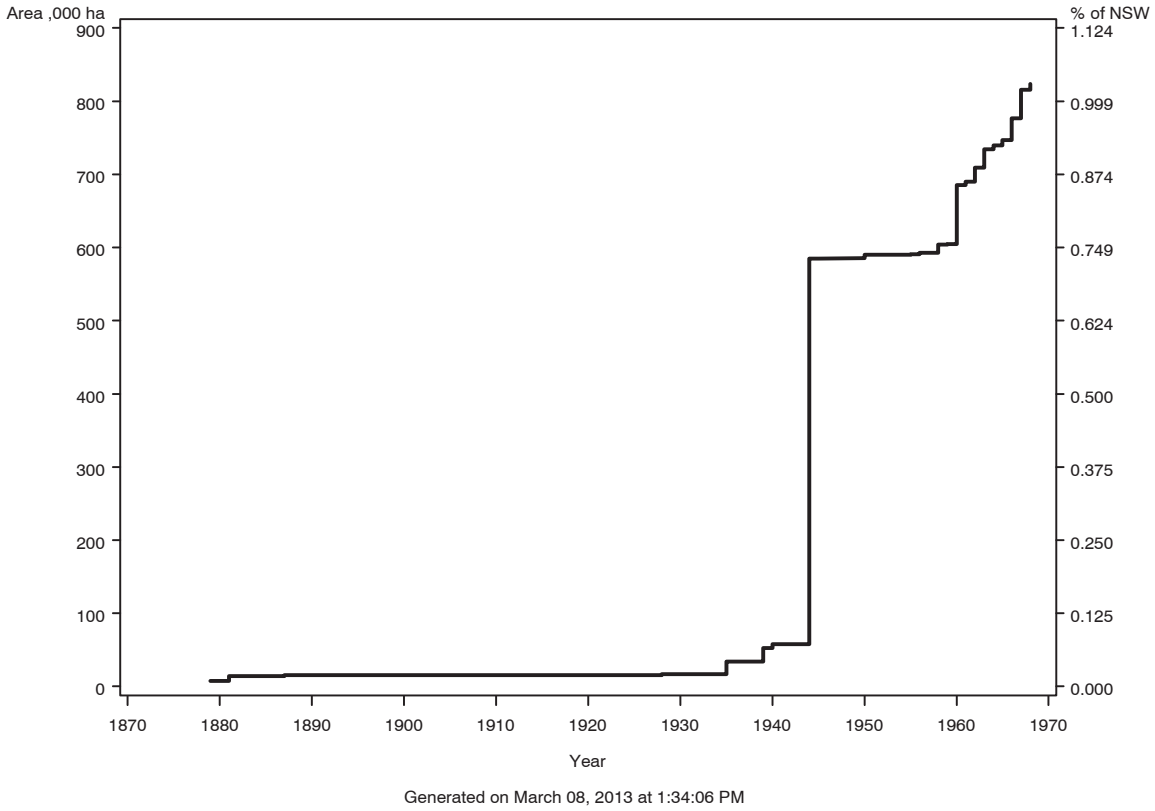
Graph 2: Area of National Parks up to 1967



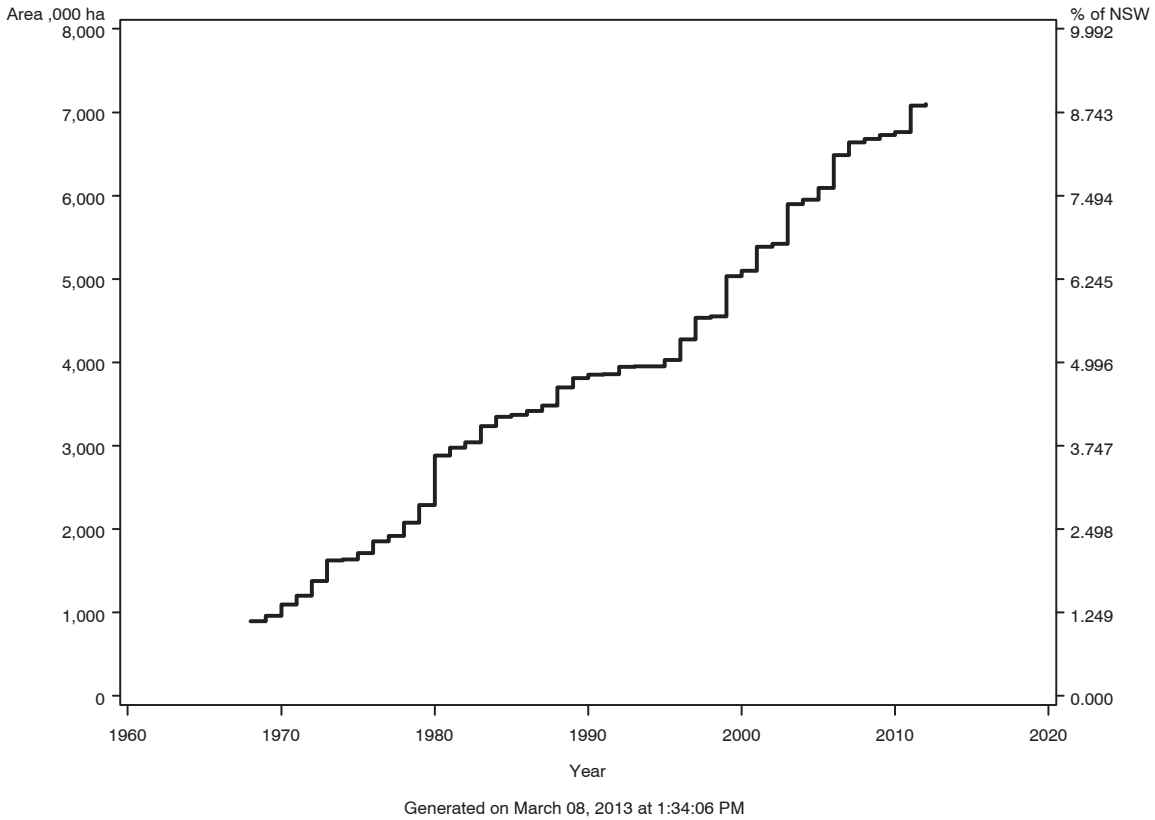
Graph 3: Area of Nature Reserves up to 1967



Graph 4: National Parks plus Nature Reserves up to 1967



Graph 5: National Parks plus Nature Reserves since 1967



"the exposure of articles for sale" and the hunting of both native and introduced fauna (Elwell 1893: 17). The responsibility for enforcing these policies lies with "all employees of the Park Trust", who have been "sworn in as special constables" and are henceforth "enjoined and empowered" to ensure their effective implementation. In the Trustees' estimation, they have been successful:

"This policy of preservation is already achieving the desired results, for the National Park is now the haunt of a great variety of beautiful birds. […] The almost extinct lyre-bird, free from molestation, can be daily seen, about sunrise and sunset, seeking its food among the brush glades and stately ferns on the banks of Bola Creek. Now and again the satin-bird, the regent-bird, the rifle-bird, all famed for their beauty of plumage, and which, in their wild state, are becoming rarer and rarer owing to the insatiable and wanton cruelty of prowling hoodlums and men of higher degree who degrade the name of sportsman, can be seen flitting from tree to tree in some of the deeper recesses of this guarded reserve."

The paragraph concludes with the only mention of mammals: "A few marsupials remain. Sometimes on a still night the eerie howl of the dingo can be heard on the lonely mountain sides, and the handsomely-marked native cat has been known to leave evidences of nocturnal depredations" (Elwell 1893: 17-18).

A number of points about fauna management can be drawn from these notes. The most striking is that, by 1914, the National Park was seen as a sanctuary for animals. This was not mentioned in 1879. This development could be taken to reflect the influence of the Zoological Society and its interest in acclimatisation, and the particular interests of its convenor and amateur ornithologist Walter Bradley – one of the original Trustees. Either fauna was an unheralded initial interest in setting up National Park, or it was a concern that did not come to fruition until shortly after the park was established and professionally managed. The next point of interest is that the Trustees recognised the incompatibility of stock and national park aims. However, the loss of fauna beyond the park was laid at the door of the hunter, not the clearing of land, nor the running of cattle and sheep. What is evident is the pride in the fact that the National Park did hold birds of such beauty that the Trustees knew would gain public approval. The phrase 'almost extinct' shows an insight into what fate a species might face if not protected. Although it is unclear whether this phrase refers to the state of the lyre-bird population within the Park or within Australia more widely, the use of such language is remarkable given that, at the time, no working knowledge existed of the extinction of any Australian vertebrate. Although Gould recognised that the numbers of certain species were declining, and recognised the possibility of total disappearance, there remains no evidence of any knowledge of past extinction. There were few laws that protected fauna: despite broadening the scope of protection offered to specific fauna, the *Birds and Animals Protection Act 1918* was in many ways ineffective (Stubbs 2001), and it was not until the *Fauna Protection Act 1948* that native birds and mammals received widespread legislative protection which provided for the establishment of faunal reserves. Jarman and Brock (2004) provide a history of these laws and the evolution of the concept of 'endangered species'.

As an ecologist with a particular interest in fauna conservation, I look at Royal National Park in a regional context, with a particular interest in the koala *Phascolarctos cinereus*. Royal National Park does not hold the high quality habitat that koala populations need to survive. It does hold patches of koala habitat, but it is the land in and around Campbelltown, to the west of Royal National Park, with an arc of land to the south, that carries koala habitat, and indeed a koala population that has been there continuously since European settlement (Lunney et al. 2010a,b). Koalas can literally walk from Campbelltown to Royal National Park; indeed, tagged koalas have demonstrated this ability. In view of this, the Park can be recolonised, with the major barrier being the Princes Highway, a killing zone on the western edge of Royal National Park. It is the position of koalas in Royal National Park, or the current lack of koalas, that Tim Flannery has targeted to expose what he sees as the weakness of our national parks in regard to wildlife conservation. Flannery's argument is brief: "If we look around at our national parks today, what we see in the great majority of cases are marsupial ghost-towns, which preserve only a tiny fraction of the fauna that was there in abundance two centuries ago. A classic example is Royal National Park south of Sydney. It's the nation's oldest park, yet over the last few decades it has lost its kangaroos, its koalas, its platypus and greater gliders. Clearly, it is a fallacy to believe that proclaiming more such reserves will do very much to preserve Australian wildlife." (2003:39)

My interpretation of koala distribution is that it is much more tied to factors such as soil fertility, watered lands and nutrient-rich leaves. The lands which fit these criteria are now mostly agricultural lands, which have largely been cleared so that habitat loss is the primary cause of the decline of the koala

in NSW (Reed et al. 1990; Reed and Lunney 1990). Koala conservation is an issue for land use planning to protect koala habitat on private land, as is the management of other threats, such as fire, dog attack, disease and death on the roads, as stated in the NSW 2008 Koala Recovery Plan (DECC 2008). There are plans in place to tackle these matters and the Senate (2011) recently released its findings into the health and status of the koala. It is concerned for its future in Australia. It did not, however, identify the supposed failure of national parks as a problem. Flannery is right to point out that we cannot rely solely on national parks and nature reserves to conserve all our wildlife, for their conservation does depend heavily on the lands with the rich soils, which of course were the ones cleared early and so comprehensively (Lunney & Moon 2012). However, it is hard to read such a sensible cautionary note into Flannery's sentences. It is easier to read his text as being dismissive of parks and reserves for conserving wildlife. In this regard, his argument is reminiscent of the criticism of the reserve system contained in the Commonwealth's 1996 *State of the Environment* report, which contended that as the existing system did not reflect terrestrial biodiversity, it had "only limited value as an antidote" to the threats facing biodiversity (Commonwealth 1996: 49; Lunney 1998).

What is alarming is the logic of the leap that Flannery makes from saying that Royal National Park had lost its koalas to arguing that proclaiming more reserves will not do very much to preserve our wildlife. Flannery had not established that koalas were there at first settlement, or ever flourished there. Partly, this is due to the fact that the fauna records of the Park are patchy and heavily weighted towards recent decades (although he does not acknowledge this). This evidentiary deficiency, however, does not of itself justify Flannery's conclusions. I have yet to find an early record, but my general thesis is that koalas were not likely to be present so close to the coast because a large population of Aboriginal people, mostly living on the food from the sea and the estuaries, would have hunted any local koalas to extinction. Locations further from the coast, such as Campbelltown, or the adjacent locations, Bargo and Nattai, where the koala was first seen in Australia by Europeans, are more likely because, in my conjecture, the local Aboriginal population would have been at a lower density. The appearance of koalas in Royal National Park may well reflect the loss of the local Aboriginal population of hunters.

It does seem to be a limited argument to select a few large mammals, consider them to be extinct in one location, and thereby write off all the parks and reserves for wildlife conservation. We might note too that Royal National Park was not set up on modern ecological principles for wildlife conservation. Why write off all the national parks and nature reserves on the basis that the first national park in Australia does not hold all of its original fauna? By all means, Flannery can point to the limitations of our parks and reserves for wildlife conservation so that we continue to tackle all the issues facing our fauna, but those limitations present, in my view, no case for abandoning what I regard as the best means we have ever devised for fauna conservation. There is no surprise that the NSW environment minister Bob Debus should reply to Flannery and state: "Let me rebut Dr Flannery's plainly ridiculous allegation that the Royal National Park…is a 'marsupial ghost town'. […] On the contrary, the NPWS is able to demonstrate that the Royal National Park does in fact provide important habitat for numerous small marsupials." He added, "In any event, Royal National Park does not exist in isolation. It is on the very edge of a continuous reserve system that runs for hundreds of kilometres" (2003:114).

The kerfuffle over Flannery's paper raises a number of important points. It shows that we do need to examine the history of an area to be able to interpret it ecologically. Arguably Flannery blundered with koalas because he knew too little about the history of Royal National Park, the specific context for its dedication in 1879, and the history of koala management in Australia. In 1879, koalas, along with other native fauna, were shot for the fur trade and as pests. Lunney and Leary (1988) document the koala fur trade at the end of the 19th century for the Bega district in the Eden region of NSW, and Gordon and Hrdina (2004) document the millions of koalas shot for the fur trade in Queensland in the early 20th century. Given these research findings, it would seem odd to propose that the species was in need of reservation of land. As the early accounts of the Park reveal, it was the Park's beautiful birds and plants that first captured the imagination. Ecological history does rely on getting the historical part of the equation right before one can speculate successfully on the cause and effect of change in wildlife numbers and distribution. The koala story of Royal National Park has not yet run its course, but it will, in my view, not support Flannery's thesis.

Further evidence which challenges Flannery's thesis has been provided by a number of koala sightings in and around the area of Royal National Park. Park rangers have reported finding a deceased koala, initially released at Kentlyn on the west side of the Georges River on 29 July 2012. By late September

2012, the koala had returned to the Sutherland area and was found dead on the western side of the Princess Highway. Additionally, a local resident living in Kirrawee photographed a koala in September 2012 (Fig. 18) from the balcony of their house, located on the northern boundary of the Park adjacent to Savilles Creek. According to Park employee Glenn Harvey (pers. comm 2013), the koala has been observed in this area for "the past couple of years". Furthermore, she states that the koala has also been sighted in the Kirrawee High School grounds and "slightly further north on Hunter Street". Harvey also reports recent sightings of "two koalas at Deer Pool" on 23 March 2013 and of one koala crossing the road at McKell Avenue (near the Park toll box) on 25 March 2013. She states that these were "credible" but unconfirmed sightings.

These sightings demonstrate that koalas inhabit the area to the Park's west and are within walking distance of the Park. This koala population is a continuous population that inhabits Campbelltown and tagged koalas have been recorded as walking as far as Campbelltown to the western edge of the Park (Lunney et al. 2010a). The fact that koalas occur within the Park but have not proliferated is evidence that Royal National Park is essentially not koala habitat. Thus, one could conclude that the Park has not 'lost' its koalas but that, instead, it never had them in abundance. A similar story is emerging for the greater glider (*Petaroides volans*). Andrew et al. (in press) detail the reappearance of the glider after its presumed disappearance in recent decades. Royal National Park was never known for containing many greater gliders, and the extensive fires of 1994 may have eliminated the small population from the Park. This work points to the fact that this glider species was never a common animal in the Park, but is capable of reaching the Park. Thus the Park has, once again, not lost its greater gliders, for it did not (excepting small patches) provide high-quality glider habitat in the first place. More broadly, this points to the importance of conserving lands which encompass the full range of habitats in a state, including the fertile lands which support species such as the koala and the greater glider.

Whatever Flannery's views on the parks and reserves system may have been in 2003, he declares strong support for it in his latest essay 'After the Future'. He contends that "the creation of the national parks system must surely be seen as the principal environmental achievement of the past half- century" (2013: 26). His comments show that even those who criticise the parks and reserves system on the basis of the 'CAR' criteria – comprehensiveness, adequacy, and representativeness – still recognise the intrinsic value and significance of the system. Given the frequency of such criticisms, even among ecologists, it is crucial to acknowledge that the parks and reserves system is an evolving idea. Consequently, one's judgement regarding its adequacy needs to be tempered by an historical perspective which recognises the importance of context. Our focus should lie on how the system might be improved, rather than on its shortfalls in view of contemporary ecological criteria.

Fig. 18. A koala sighted at Gore Avenue, Kirrawee, New South Wales (19 September 2012). Photograph by Erin Meagher.

FUTURE THREATS

At the 'Transforming Australia' conference in July 2011, Flannery launched the report on the climate change forecast for the NSW south coast (Climate Commission 2011a). This impact statement was accompanied by 'The Critical Decade' report (Climate Commission 2011b). Both project an array of worrying impacts. Alongside concerns for biodiversity and the increasing vulnerability of coastal towns due to rising sea levels, the report notes that higher temperatures will increase the likelihood of large and intense fires in the region. At particular risk are areas such as the Royal National Park and the forested escarpment behind Wollongong, including the Woronora Plateau.

As Mooney, Radford and Hancock (2001) demonstrate, fire has long been an issue for the Park, with significant fire events occurring throughout the twentieth century. This raises the issue of scale. In our study of the impact of the 1994 bushfires on the koala population at Port Stephens, we concluded that koalas rapidly re-occupy the burnt forest within months, and are breeding in the forest by the next breeding season (Lunney et al. 2004, 2007). The issue was not how many hectares were burnt, but how many were left.

In the case of Port Stephens, the fire consumed only half of the koala habitat, so recolonisation was rapid, with individual koalas walking up to 1 km per day. For Royal National Park and its non-flying fauna, the central concerns are where the refuges lie, how to manage them, and the fire history of these sites. Fire history is an integral part of an ecological history of an area. Movement from nearby areas is possible, but the barriers, particularly the major roads, are an issue of considerable significance. For koalas, re-colonising from Campbelltown is possible, but greatly hindered by the barrier of the Princes Highway. In this context, the park can be seen as too small for some species, but not a 'ghost-town'.

The International Union for Conservation of Nature's selection of Australia as the host of the 2014 World Parks Congress reflects a growing international recognition of the global significance of Australia's parks. It is therefore opportune to place Royal National Park in historical and ecological perspective. Given that the Park has existed for 135 of the 226 years since the European settlement of Australia, it reflects enormous changes in Australian society; indeed, it can be taken as a barometer of social and political attitudes, especially in regard to the development of a conservation ethic. In the years since its dedication, our understanding of what constitutes a national park has undergone a distinctive intellectual shift. This has paralleled a transformation of our understanding of fauna conservation and land use, and the role of government in the management of land. It is tempting to examine Royal National Park solely from an historical perspective or an ecological one; what is more novel is integrating the two interpretive frameworks in order to understand what the dedication of the park signified in 1879, and how this has since changed. For the Park, this has meant analysing a variety of sources, including maps, records of fauna, media reports, and statistical data. Looking at the environment of the park in the context of its socio-political history, as a major part of our first steps toward nature conservation, and in view of future threats, all point to the necessity of integrating historical and ecological thinking.

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APPENDIX 1

Gallery: Linnean Society Conference (September – October 2011). All photos by Dan Lunney.

Emma Gorrod loading Paul Adam's Royal National Park presentation in the conference room at Kamay Botany Bay National Park (29 September 2011).

David Keith on the Forest Path, Royal National Park (1 October 2011).

Val Attenbrow on the Forest Path explaining the Aboriginal use of the Park (1 October 2011).

David Keith on the heath in Royal National Park, showing where some of his long-term plots are located (1 October 2011).

John Pickett describing the geological attributes of a site (1 October 2011). What is most prominent in the photo is the clearing, and it shows what the park would look like if it were to be cleared, or had been cleared in the previous two centuries.

A sure sign of the continuing presence of the cryptic Javan rusa deer (*Cervus timorensis*) in Royal NationaLPark (1 October 2011).

John Pickett explaining the geological basis of Royal National Park (1 October 2011).

A felled tree on the Forest Path, part of which still remains, as does the stump. A education notice nearby states: “Logging was permitted on at least two occasions in the first quarter of this [20th] century”.

Appendix 2. Parks and Reserves (pre-1967).

Park/Reserve	Modifications	Financial Year	Area (Ha)
Royal NP	1	1879	7284.34
	2 (+)	1881	14164.00
	3 (+)	1883	14171.69
	4 (+)	1887	14698.18
	5 (+)	1900-1964	15383.72
	6 (+)	1964	15769.39
	7 (-)	1966	14384.55
	8 (-)	1967	14250.20
	9 (+)	1967	14851.96
Blue Mountains NP	1	1960	62726.27
	2 (+)	1963	68739.9
	3 (+)	1966	95028.28
	4 (+)	1967	98772.03
	5 (-)	1967	98367.34
Brisbane Water NP	1	1960	6070.28
	2 (+)	1960	6147.98
	3 (+)	1965	6181.98
	4 (+)	1966	6610.94
	5 (+)	1967	6692.69
	6 (-)	1967	6691.48
Dharug NP	1	1967	11748.83
Gibraltar Range NP	1	1963	13961.65
	2 (+)	1966	15378.05
Kosciusko NP (now Kosciuszko)	1	1944	527019.68
	2 (+)	1945	527270.59
	3 (+)	1950	531438.85
	4 (+)	1950	531756.93
Ku-ring-gai Chase NP	1	1962	14244.93
	2 (-)	1962	14238.46
	3 (-)	1967	14187.47
	4 (+)	1967	14285.4
Morton NP	1	1939	18210.85
	2 (+)	1963	18213.69
	3 (+)	1965	18214.9
	4 (-)	1965	18214.5
	5 (+)	1967	18240.8
Mount Kaputar NP	1	1960	4168.26
	2 (+)	1967	14244.93
New England NP	1	1935	16855.16
	2 (+)	1940	22520.76
	3 (+)	1942	22723.1
	4 (+)	1959	22724.72
	5 (-)	1959	22723.1
	6 (-)	1967	22237.48
	7 (+)	1967	22844.5

Warrumbungle NP	1	1962	3237.49
	2 (+)	1967	6239.04
Barangary State Park	1	1887	849.84
	2 (-)	1967	797.23
Bouddi State Park	1	1959	473.48
	2 (+)	1959	518
	3 (+)	1967	530.14
Bundanoon State Park	1	1961	1347.6
Dorrigo State Park	1	1928	1416.4
	2 (-)	1930	1415.59
	3 (+)	1936	1566.13
Gloucester Tops State Park	1	1960	1550.76
Heathcote State Park	1	1963	1578.27
Mount Warning State Park	1	1966	2116.51
Muogamarra State Park	1	1955	829.61
	2 (+)	1962	1120.98
	3 (-)	1967	1112.89
Bare Island Historic Site	1	1965	1.21
Captain Cook's Landing Place	1	1900	95.51
	2 (+)	1965	105.22
	3 (+)	1967	283.28
Hill End Historic Site	1	1967	27.52
La Perouse Monuments Historic Site	1	1956	7.28
	2 (+)	1967	7.69
Mootwingee Historic Site	1	1967	485.62
Vaucluse House Historic Site	1	1967	7.69
Barren Grounds Nature Reserve	1	1956	1489.241
	2 (+)	1960	1776.5674
Bell Bird Creek Nature Reserve	1	1965	53.4184
Bermaguee Nature Reserve	1	1967	607.0275
Bird Island Nature Reserve	1	1960	7.2843
Black Ash Nature Reserve	1	1965	89.0307
Boondelbah Nature Reserve	1	1960	9.3078
Boorganna Nature Reserve	1	1955	267.0921
	2 (+)	1958	308.2688
	3 (+)	1962	382.7308
Bowraville Nature Reserve	1	1963	54.6325
	2 (+)	1964	58.477
Brush Island Nature Reserve	1	1964	46.5388
Buddigower Nature Reserve	1	1964	137.5929
Cocopara Nature Reserve	1	1964	1308.347
	2 (+)	1965	4646.998
Cook Island Nature Reserve	1	1960	4.6539
Coolbaggie Nature Reserve	1	1963	381.2133
Cudmirrah Nature Reserve	1	1959	125.4522
Curumbenya Nature Reserve	1	1965	2832.795
	2 (+)	1967	8599.556

Devils Glen Nature Reserve	1	1965	40.4685
Five Islands Nature Reserve	1	1960	26.7092
Georges Creek Nature Reserve	1	1968	1189.774
Goonawarra Nature Reserve	1	1967	437.0598
Goura Nature Reserve	1	1967	390.521
Gurumbi Nature Reserve	1	1956	151.757
Illawong Nature Reserve	1	1964	50.5856
John Gould Nature Reserve	1	1955	26.3045
Julian Rocks Nature Reserve	1	1961	0.4047
Limpinwood Nature Reserve	1	1963	2321.273
	2 (+)	1967	2442.6785
Lion Island Nature Reserve	1	1956	8.0937
Little Broughton Island Nature Reserve	1	1961	36.4217
Macquarie Nature Reserve	1	1966	2.4477
Manobalai Nature Reserve	1	1968	2913.732
Moon Island Nature Reserve	1	1960	1.0117
Mount Seaview Nature Reserve	1	1965	194.2488
Munghorn Gap Nature Reserve	1	1961	2853.029
	2 (+)	1968	2994.6688
Muogamarra Nature Reserve	1	1960	303.5147
	2 (+)	1965	801.2788
	3 (+)	1967	803.9093
Nadgee Nature Reserve	1	1958	11331.18
	2 (+)	1961	11655.9397
	3 (+)	1966	11836.0245
Narrandera Nature Reserve	1	1966	72.8433
North Rock Nature Reserve	1	1959	4.0469
Pulletop Nature Reserve	1	1963	145.0796
Quanda Nature Reserve	1	1963	429.3708
	2 (+)	1967	853.8854
Round Hill Nature Reserve	1	1960	5179.968
	2 (+)	1964	5252.8113
	3 (+)	1967	5637.2621
Rowleys Creek Gulf Nature Reserve	1	1962	1659
Sherwood Nature Reserve	1	1967	1359.742
South West Solitary Island Nature Reserve	1	1961	3.2375
Split Solitary Island Nature Reserve	1	1961	3.6422
Tabletop Nature Reserve	1	1966	103.5184
The Basin Nature Reserve	1	1964	2272.711
The Charcoal Tank Nature Reserve	1	1966	86.4002
The Hole Gulf Nature Reserve	1	1965	737
The Rock Nature Reserve	1	1963	271.139
Tollgate Islands Nature Reserve	1	1959	12.1406

Tucki Tucki Nature Reserve	1	1963	1.4948
	2 (+)	1964	3.2375
	3 (+)	1967	4.0026
Winburndale Nature Reserve	1	1968	3642.165
Wongarbon Nature Reserve	1	1966	99.1478

Appendix 3. National Parks Estate (1968-2013) at 30 June of the financial year.

Financial Year	Area (ha)
1968	894,872
1969	960,901
1970	1,096,776
1971	1,201,814
1972	1,379,278
1973	1,626,702
1974	1,638,563
1975	1,714,789
1976	1,852,407
1977	1,917,887
1978	2,076,950
1979	2,291,591
1980	2,884,692
1981	2,975,628
1982	3,039,640
1983	3,236,999
1984	3,346,667
1985	3,368,447
1986	3,415,196
1987	3,485,124
1988	3,697,308
1989	3,811,073
1990	3,853,541
1991	3,859,959
1992	3,945,810
1993	3,951,314
1994	3,955,318
1995	4,030,559
1996	4,273,545
1997	4,536,513
1998	4,553,084
1999	5,032,553
2000	5,099,674
2001	5,387,102
2002	5,419,344
2003	5,899,882
2004	5,948,814
2005	6,092,447
2006	6,487,055
2007	6,641,256
2008	6,682,405
2009	6,725,069
2010	6,763,629
2011	7,077,769
2012	7,079,707
2013	7,083,343