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Sutherland Shire Environment Centre is a not-for-profit community organisation that has been actively involved in advocating for the environment in the Sutherland Shire and our surrounding bio-regions since 1991. On behalf of our members we welcome the opportunity to respond to the Royal National Park, Heathcote National Park, and Garawarra State Conservation Area Draft Plan of Management.

We have reviewed the three planning documents: the Draft Planning Considerations, Draft Plan of Management, and Draft Mountain Biking Plan, carried out extended research, consulted extensively with our members, former NPWS rangers, managers, PhD level ecologists, and experienced field naturalists.

This submission consists of three sections.

The first is this preamble, which raises issues we believe merit more serious consideration in the new plan of management. These relate to:

- Protecting the natural values of the parks – general comments relating to the National Parks and Wildlife Act p.3
- Increasing Usage, compliance, resource allocation, and staffing pp.3-7
- Outstanding issues in relation to previous plan of management performance indicators p.8
- Feral pests, dated field surveys, and the ecological integrity of the parks p.9
- Park connectivity and wildlife corridors pp.10-11
- The draft mountain bike plan of management - pp.12-28
- Port Hacking additions to the Royal National Park Estate – pp.29-31
- Spring Gully - recommendation for strategic acquisition – p.32
- The Metropolitan Colliery, Camp Gully Creek, and the risk to the ecological integrity of the Hacking River – pp.33-41

The second section is a more detailed account making the case for a wildlife crossing at Cawleys Road Bridge, by Sutherland Shire Environment Centre member Bob Crombie.

The third section is our response to the proposed schedule of operations as set out in Table 6 of the draft plan of management.

Overall, we submit the new draft plan of management should be withdrawn or heavily revised to ensure conservation values and the requirements of the National Parks and Wildlife (NPW) Act 1974 are upheld.



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Sutherland Shire Environment Centre



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Sutherland Shire Environment Centre

Protecting the natural values of the park - general comments relating to the National Parks and Wildlife Act

Protecting the natural values of the park was listed as a priority for a majority of people responding to the 2017 discussion papers.¹ It is good to see ‘protecting natural values’ emphasised with the vision expressed in the draft plan emphasising the importance of “the ecological integrity and biodiversity” of the parks.² It is also encouraging that the management principles of the National Parks and Wildlife Act are delineated as parameters guiding the new draft plan of management.³

The NPW Act sets out the legal obligations of NPWS: activities that are not consistent with the Act should not be incorporated in the plan of management. Of particular importance we note those points in the Act requiring:

- the conservation of nature, and protecting ecological integrity for future generations.
- the conservation of objects, places or features (including biological diversity) of cultural value.
- promoting public appreciation, understanding and enjoyment of natural and cultural heritage and the need for conservation.
- sustainable visitor use that is compatible with the conservation of natural and cultural values.
- providing for the management of land reserved.
- provide for appropriate research and monitoring.

The Act supports “Sustainable visitor use”: the key word here is “sustainable”. This means activities which do not compromise those parts of the Act concerned with “the conservation of nature, and protecting ecological integrity for future generations.” The draft plan of management notes the Royal and Heathcote National Parks, and Garawarra State Conservation Area are “one of the most species-rich group of parks in Australia”.⁴ The Royal and Garrawarra are recognised on Australia's National Heritage List as having “outstanding significance to the nation”.⁵

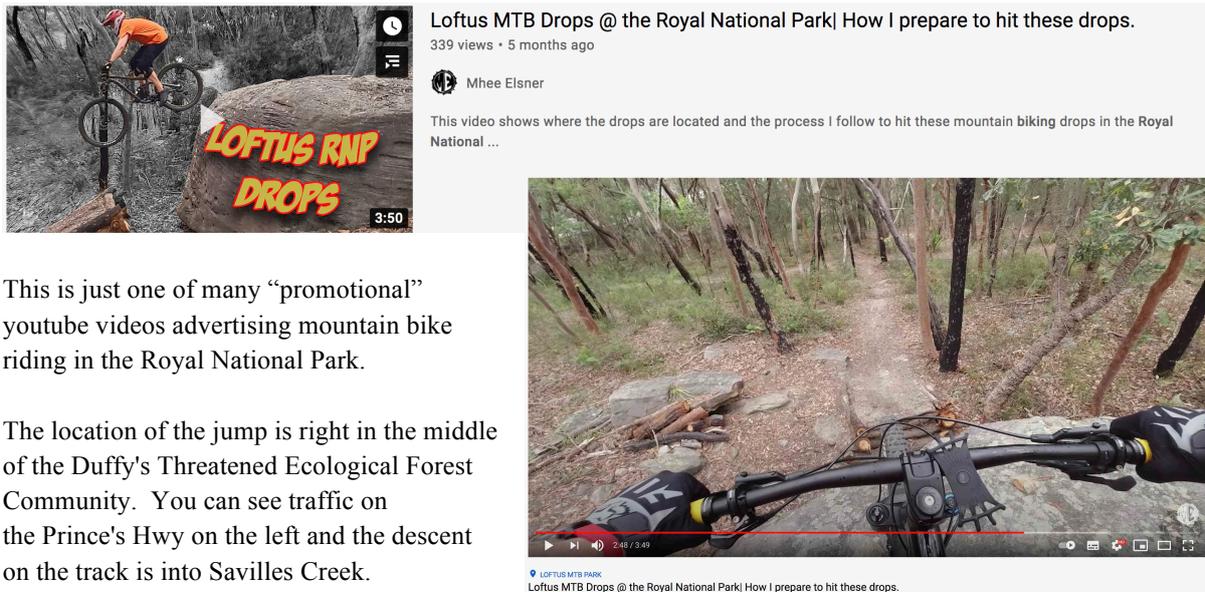
These areas merit the highest degree of care and protection. We submit that this draft plan of management does not fully support this aim, and fails to supply key performance indicators identifying the degree which NPWS has fulfilled its mandate to date.

Increasing Usage, compliance, resource allocation, and staffing

The number of people visiting the Park each year is estimated at over six million.⁶ The capacity of Royal National Park is finite - increasing demands on the park should not permit the destruction of the natural attributes which attract people to the area in the first place.

We support the concept of Zones One and Three: with the provision that spot zoning is not permitted in Zone One. We do not support the plan for “visitor opportunities in Zone 2 areas.

Many endangered species and endangered ecological communities exist in the 'Zone 2' areas. Maps of mountain bike tracks are shown in the plan of management, but not all the tracks, or the extent to which they traverse endangered ecological communities. Mountain bikes have caused significant damage to fragile habitat in these areas, much of which has taken place out of view of the general public. Disguising the extent of damage, and what will occur if it continues is not in keeping with the requirements of the Act. It should not be legitimised by formally transforming these areas into a themed adventure sports park, as will occur with the tacit acquiescence to braiding between tracks that the reclassification of this zone approves.



This is just one of many “promotional” youtube videos advertising mountain bike riding in the Royal National Park.

The location of the jump is right in the middle of the Duffy's Threatened Ecological Forest Community. You can see traffic on the Prince's Hwy on the left and the descent on the track is into Savilles Creek.

These “how to” videos encourage and support illegal trail building, and let other riders know the location of new unauthorised trails. Conservation values are not apparent – in the photo on the right, note the trees which have been cut and stacked to create the jump <https://www.youtube.com/watch?v=uos32jTJMK0>

We discuss the mountain bike draft plan of management and damage to the ecology of the parks in further detail below. There is an urgent need to restore park values, remove illegal trails, and reinstitute environmental conservation in areas impacted by mountain bike damage.

We note that within the park approximately 25-40 species have already become extinct - the number is approximate as the last overarching NPWS survey was published ten years ago, in 2011, with the report *The Vertebrate Fauna of Royal & Heathcote National Parks and Garawarra State Conservation Area*.⁷ The field surveys which contributed to that report are even older. The draft plan of management nevertheless cites a number of threatened communities and species within the park: “12 threatened ecological communities, 16 threatened plants and 44 threatened animal species”.⁸

The objectives of the NPWS Act make it imperative that adequate monitoring and strict compliance regimes are implemented to protect the ecological integrity of the parks. To do otherwise is inconsistent with the Act.

Our members have consistently raised concerns relating to lack of effective resourcing and the number of rangers in the Royal National Park. Visitation rates have increased significantly over the past few years. We have requested, **but have not received information regarding staffing levels.** On weekends and during busy periods it seems only 3 rangers are available to monitor the Royal, Heathcote, Garrawarra, and the Georges River National Parks. Feedback from our members is that it often appears that the primary role of NPWS staff is to act as parking police.

Sutherland Shire Environment Centre values the work of volunteers in the park: especially Friends of the Royal National Park, and their significant long term contribution assisting NPWS to manage problems such as weeds and rubbish. Our concern is the extent to which volunteer groups are being relied on to step in for staffing shortfalls.

In terms of compliance no effective action is being taken to address illegal activities taking place: mountain bike riders on illegal trails and dog walking are the most notable examples.



Off leash dogs and close up of owners on the Temptation Creek Management Trail.

Over years such activities have escalated, unchecked, and have become normalised. This has in turn resulted in an aggressive culture of entitlement. Our members have consistently raised these concerns with us over many years. Dozens of our members have complained that many dog owners respond aggressively if questioned about their dogs being in the park.

A management plan should detail what actions need to be taken to comply with the Act, and point to funding shortfalls which are obstructing progress.

On the Anana Hill Management Road Trail.
This track is frequently used by dog owners taking a shortcut through the park to reach the sporting oval near Greys Point School, rather than walking along North West Arm Road.



On the Anana Hill Management Road Trail.



Dog owners at the top of Greenhaven after exiting the park with two dogs on leash.



Women with 3 off leash dogs on Savilles Creek Track. Approx 10 people with dogs were seen on this track within a 1 hour period on this day. When informed that it was National Park and dogs were not permitted, most seemed aware they were breaking the law. This area is adjacent to Kirrawee which has an off-leash dog park.

Man with off-leash dog on Florence Parade management Trail approaching junction with Temptation Creek Management trail.



On-leash dog taken past signage towards Karloo Pools near Heathcote.

Previous plan of management (2000) performance indicators

The previous plan of management (2000) promised the “protection and where necessary restoration of nature conservation values”.⁹ There appear to be few performance indicators that measure and report progress on this goal. What animals / plants have become locally extinct since the publication of the last management plan? What gaps in knowledge exist? On the whole, as noted above, data cited in the Planning *Considerations* document is 10-20 years old. No comprehensive species count, field surveys, or analysis has been conducted since the *Vertebrate Fauna* report was completed in 2011. The Royal National Park is listed as a site involved in a Saving our Species program for the broad-headed snake¹⁰, but large areas of habitat have been compromised by illegal mountain bike trails which have been allowed to proliferate.

The *Considerations* document released with the draft plan of management notes that 10 years ago “recommendations for monitoring, further survey and research” were made.¹¹ It is not apparent these recommendations have been acted on. Will a broad, systematic monitoring program within the three reserves be implemented in the near future? Do NPWS staff have time to carry out systematic surveys and analysis? Is fauna sighting data uploaded to Bionet happenstance? Is research being outsourced due to funding cuts? What amount of research is being carried out by volunteers compared to rangers? Further information regarding such performance indicators should be made public. What plans are in place to protect iconic animals in the parks? Swamp Wallabies? Lyrebirds, koalas, and greater gliders? What research has been done re platypus? The last were sighted in 2004, near Camp Gully Creek. We have a detailed plan for mountain bikes tracks, but not protection of native species.

Progress on many stated objectives in the 2000 Plan of Management appear to have been slow to non-existent. For example, no measurable impact on the number of feral deer is evident despite a stated goal of humane eradication¹², and detailed strategies for achieving this in the 2011 *Vertebrate Fauna* report.

The *Vertebrate Fauna* report noted off-leash dogs were a major disturbance to Oystercatcher habitat at Constables Point and Jibbon Beach.¹³ Despite multiple complaints to Sutherland Shire Council and Royal National Park managers by our members over the years, as noted above, off-leash dogs remain a problem and suggested NPWS management responses have not been implemented.



Off leash dog chasing endangered Oystercatchers at Deeban Spit. Breaches such as this occur on a frequent, and often daily basis.

Feral pests, dated field surveys and, the ecological integrity of the parks

A plan of management should not be empty rhetoric. The full range of risks which threaten the ecology of the parks needs to be accounted for and addressed. Actions taken to ensure “ecological integrity and biodiversity” is protected, and risks mitigated, should not be tokenistic. Unfortunately it seems that despite the failure to meet performance objectives in the previous plan of management, the current draft plan does not do enough to address threats driving plant and animal species within the parks to the brink of extinction. Feral pest control is barely mentioned in either the draft plan of management or the *Considerations* document. Despite its ecological riches, there is a relative dearth of academic research on the Royal National Park, Heathcote, and Garrawarra. More recent surveys and analysis to ascertain the health and numbers of native populations in each park is urgently required. Actions taken should be proactive to address on-going risks that compromise plant and animal populations, not only regarding immediate threats to endangered species.

We applaud the successful aerial culling deer operation which has taken place over the last few months, and support this being conducted on a more frequent basis. Just as evident is an urgent need for effective fox control measures. Fox predation is a “key threatening process”. Environment Centre members living in Bundeena and Maianbar have reported that the mammals they most commonly see in the Royal National Park now are foxes and deer. Wallabies are rarely sighted. The 2011 *Vertebrate Fauna* survey attributes the disappearance of Rednecked Pademelons from the reserves to fox predation.¹⁴ The *Considerations* document states that “Scat analysis in the parks has shown that foxes commonly prey on the long-nosed bandicoot, swamp wallaby, swamp rat and threatened eastern pygmy-possum.”¹⁵ All ground dwelling birds in the parks face these threats. Fox are also problematic for adjacent habitat: less than 200 nesting pairs of Pied Oystercatchers have been recorded in NSW.¹⁶ A pair have been attempting to nest at Deeban Spit: in 2016-18 Oystercatcher eggs from that location were taken by foxes.

There seems to have been a complete lack of action on the part of NPWS management to address the issue over many years now. Meanwhile there has been little to no recent comprehensive field surveys or research to study the impact of predation. NPWS is failing its duty of care in this regard. The vertebrate fauna survey is outdated; even ten years ago a number of birds and other animals in the parks were listed as endangered.

Fox control measures should be included in the plan of management explicitly, as a high priority, with action items implemented as a matter of urgency. To do otherwise is wholly incompatible with the requirements of the NPW Act which call for the ecological integrity of these parks to be protected for future generations.

It is not clear by what rationale the draft plan of management has failed to emphasise the importance of this issue.

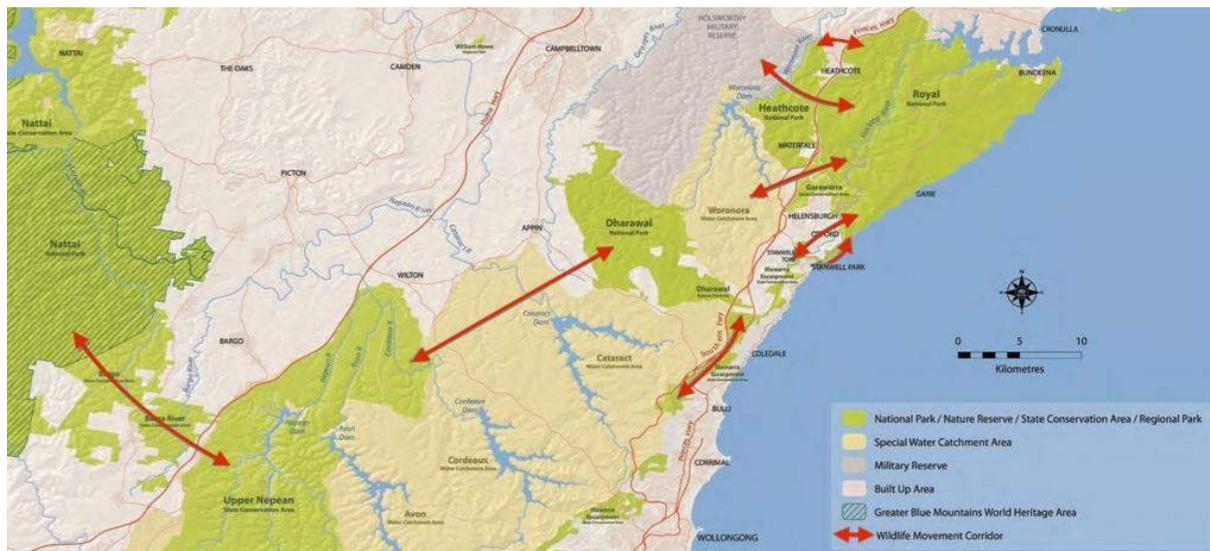
Park connectivity and wildlife corridors

As a matter of risk management, and in keeping with the objective of the NPW Act we submit the plan of management should prioritise actions to restore connectivity between Heathcote National Park, the Royal, the Garawarra State Conservation Area, and surrounding habitat. The plan of management acknowledges the importance of “crucial habitat links with inland ecosystems”¹⁷, and supports addressing this in principle, but with vague statements rather than actions.¹⁸ This is not sufficient. The issue should be dealt with as a matter of urgency. Even with devastating bushfires, similar to those in 1994, over time a species would repopulate one area from another. However, fragmentation of the Reserves prevents this. Genetic diversity is another issue.

Goldingay (2012) lists habitat degradation as one of three significant challenges for park management: the other two are habitat connectivity, and fire management.¹⁹ He refers to the Royal as a ‘habitat island’, the Princess Highway and the F6 act as 30-40m wide barriers, and the South Coast train line adds another 25m to that distance.²⁰ As the draft plan of management *Considerations* document notes:

“The effects of these barriers are most critically felt during catastrophic events such as extensive and severe wildfire... These barriers are likely to be a major factor in the local extinction of several species.”²¹

If such barriers are a factor in local extinctions why is this not addressed as a priority in the plan of management? The Garawarra and Royal are relatively small reserves, isolated from surrounding natural lands.



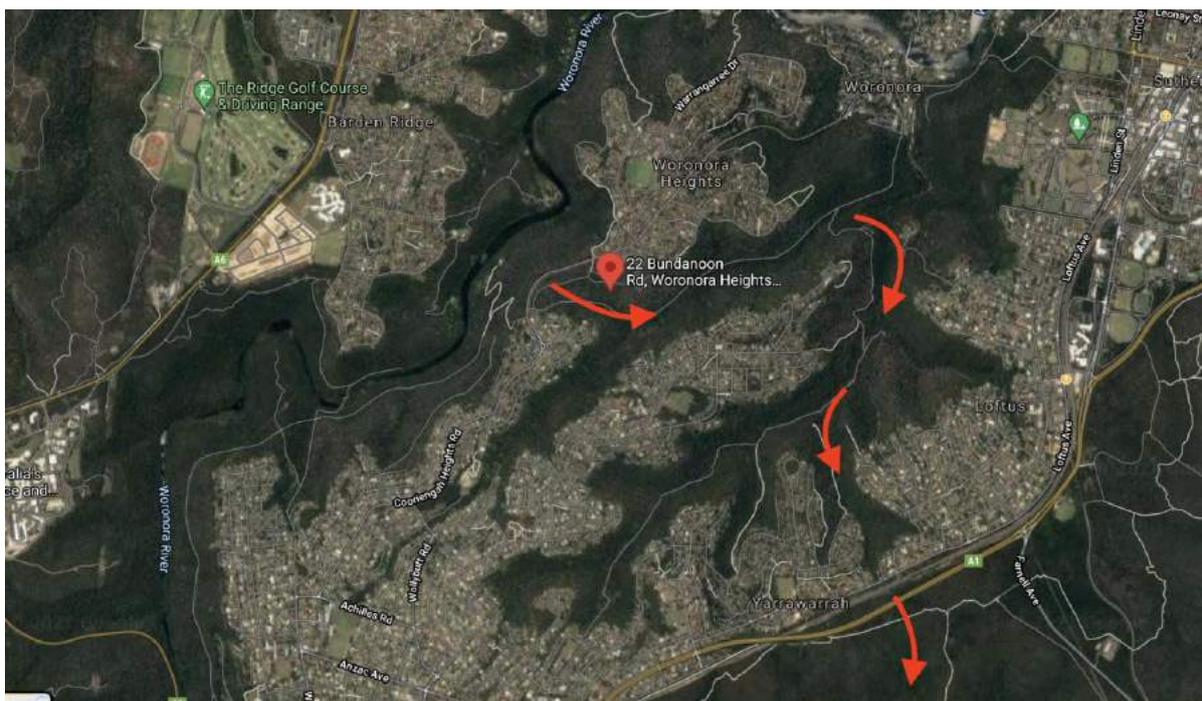
Mosley 2012, Fig.7 CP7 - note the addition of a potential overpass site near Loftus

Greater Glider numbers in the Royal National Park collapsed following the 1994 fires. There have been less than a half a dozen sightings in the last 10 years. Recovering this population should be a matter of urgency. Instead nothing is done, but we have a mountain bike plan

that traverses several endangered ecological communities, forming an additional barrier and threat to habitats. Meanwhile Bionet data shows multiple sightings of koalas in the Royal and Heathcote National Parks. Koalas face the possibility of extinction in the wild by 2050: these populations are a significant part of our common wealth: an intergenerational asset. They should be declared as such under category 188H of the NPW Act, and overpasses and underpasses between reserves put in place to sustain the species.

A precedent for wildlife crossings in Sydney exists with a number of underpasses and overpasses between national parks have been incorporated as part of the Mona Vale Road upgrade²². It is reasonable to expect such measures should be instituted to protect the biodiversity of Australia's first national park. We have **attached** a proposal drafted by one of our members, Bob Crombie, a former NPWS ranger regarding a potential overpass at Cawley's Road Bridge. The Environment Minister Matt Kean requested this be included with our submission to the draft plan of management.

Additional possibilities include a location 3km south of the Cawleys Road Bridge, where the Princess Highway passes under the F6. This could be modified to serve as an underpass. Another potential crossing is located between Loftus and Yarrawah where the highway narrows, with a koala corridor leading up to a vegetated area between Roebourne St and Celosia Place, as per the image below. We submit the plan of management should include considered recommendations regarding these or similar sites.



Another possible site for an overpass, following the koala corridor from Woronora River.

Mountain Bike Plan of Management

Our members do not support the proposal for an expanded 54 km network of mountain bike trails within the Royal and Heathcote National Parks, and the Garawarra State Conservation Area. There are 150 km of management trails and public access roads already existing in the three parks. We submit that mountain bike activities should be restricted to currently approved bike tracks - these are sufficient to cater for the majority of people and families who enjoy the experience of cycling amidst exceptional surroundings.

Mountain biking on single tracks is simply **the wrong activity to allow in reserves that are so critical for providing a nature ‘oasis’ for large population centres**. The proximity of these reserves to Sydney and the Illawarra subjects them to exceptionally high visitation rates²³ which increases both the responsibility to maintain the natural values for the enjoyment of the majority of visitors,^{24, 25} while stretching the resources to do so. The expansion of mountain biking as proposed in this plan of management will disproportionately damage the natural and cultural values of the reserves for a thrill-based activity that can be catered for in areas that have not been set aside for environmental conservation.

The extension of the mountain bike network which the draft plan proposes is inconsistent with the objectives of the National Parks and Wildlife Act, especially those sections which require NPWS to conserve nature, and protect the ecological integrity of the parks for future generations. We do not support the visitor zone 2 delineated in Table 2 as it sacrifices significant portions of the parks to ongoing damage from mountain bike users. These areas contain multiple endangered ecological communities, threatened and endangered species. Damage to these is listed as an **offence in 2.4 of the Threatened Species Act 2016 No. 63**. The unauthorised, dense network of trail building in these areas has already fragmented and destroyed large areas of habitat. Unauthorised tracks need to be closed and illegal activities within the park stopped. Remediation of these tracks should be prioritised over creating an even larger network to appease the demands of a small group of extreme sports enthusiasts.

The economic burden for expanding mountain biking in the reserves is likely to greatly exceed any economic gain. In part, this is because the scale is too small to attract tourists regardless of the proposed additions²⁶. The financial contribution of mountain bikers to the reserves or local businesses would be miniscule: 72% of mountain bikers live within a 30 minute drive of the reserves and 41% use their bikes to get there²⁷. Even the 48% who arrive by car are likely to park in adjoining suburbs rather than pay park entry fees. Costs for ongoing maintenance and remediation of unauthorised tracks will obscure any small economic benefit.

The proposal fails to properly identify and provide details on the mitigation of negative impacts. We note the **omission (below)* of critical data from published literature, park maps and on the ground observation**. Adherence to the management principles of the National Parks and Wildlife act should require Environmental Impact Surveys of current

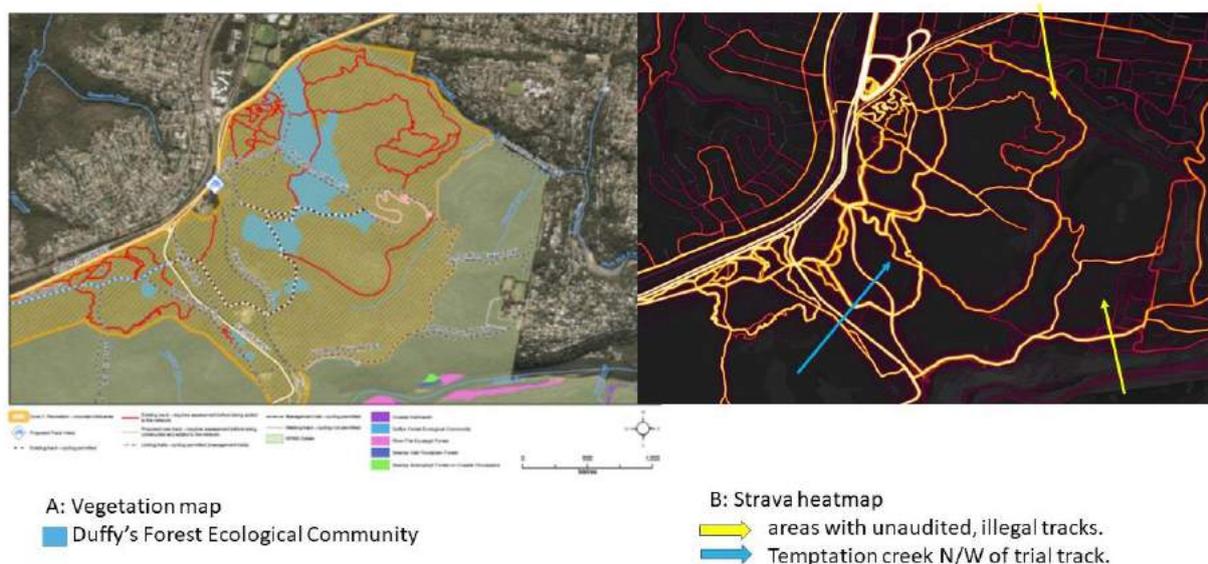
damage from mountain bikes prior to proposal of an expanded network. The use of the mountain bike consultancy company Dirt Art reflects a bias for sport over conservation and seems to be a case of regulatory capture. The primary objective of this business is an expansion of locations for the sport that sustains their business which includes track building, track design, marketing the sport, consultancy to the industry, and lobbying.²⁸ Clearly this business has a primary interest in an adventure sport, which does not involve protecting the ecological integrity of the parks for future generations.

*** Noted omissions from the mountain bike plan of management**

- **Effects of slope²⁹** - this is as relevant to erosion as soil type. Research by NPWS on the trial tracks has not explored this issue in any detail. Helensburgh zone B possesses both steep slopes and fragile soils that drain into the Hacking River. Many of the proposed tracks in the Temptation Creek area are already greatly eroded due to steep slope.
- **Threatened and fragile habitats within the proposed network** - mitigation of damage to riparian regions and the threatened Duffys Forest Ecological Community (East Heathcote and Temptation Creek), threatened Southern Sheltered forest (Helensburgh zone area A), Tall forest/rainforest corridor between Royal NP and the upper Hacking Valley and Illawarra Escarpment (Helensburgh zone area B) are not addressed (Figures 1-3).
- **Negative effects on native fauna including threatened and endangered species** - zone 2 includes habitats for Giant Burrowing Frog, Red-crowned Toadlet, Rosenbergs Goanna, New Holland Mouse, and Eastern Pygmy-possum³⁰ therefore adverse effects are likely due to collision with bikes³¹, increased predation by feral animals³², disruption of breeding cycles from amplifying human incursion³³, spreading of weeds and fungal pathogens^{34,35}, bright lights used by groups of night-time cyclists³⁶.
- **Negative effects on threatened and rare species of native flora** - those present in zone 2 include: Villous Mint Bush (*Prostanthera densa*), *Xanthorrhoea* spp., prickly tree fern (*Cyathea leichhardtiana*), sassafras (*Doryphora Sassafras*), Coachwoods (*Cerapetalum apetalum*), native tamarind (*Diplogottis australis*) and the woody climber (Parsonia staminea). These are supported by valuable stands of turpentine (*Syncarpia glomulifera*) and giant blackbutt (*Eucalyptus pilularis*), Scrub turpentine (*Rhodamnia rubescens*), Red Cedar (*Toona ciliata*), Lilly Pilli (*Acmena smithii*).
- **Proximity to sites of Aboriginal cultural significance.**
- **Prevention of damage** (braiding, erosion, damage of vegetation, unauthorised signage, vandalism of park signage, prolific unauthorised trackwork and feature building)
- **Significant underestimation of unauthorised tracks** - numerous unauthorised tracks were not included in the audit. See Figures 1B, 2B, 3B, 3C.
- **Inclusion of maps showing tracks that will be closed and remediated.** While the plan specifies that tracks will be closed due to 'culturally and ecologically sensitive areas in Heathcote National Park' and identifies some tracks in ecologically sensitive areas in Helensburgh Area B, no detail is given showing which unauthorised tracks will be closed.
- **Demonstration of effective track closure or remediation**

- **Plan or schedule** indicating how and when >>>50 km of unauthorised tracks will be closed and rehabilitated³⁷.
- **Management of electric assist and other motorised bikes.** These vehicles are becoming more popular. They are heavier, often have wider tyres and allow riders to travel faster and cover more distance exacerbating negative impacts.
- **Justification of resource allocation** - a network inclusive of a range of skill levels to cater for a tiny fraction of visitors.
- **Safety and liability** issues arising from steep tracks catering for advanced riders. Increased risk of injury on single width tracks and lack of emergency vehicle access to attend to those who become injured³⁸.

Figure 1: Temptation Creek



Evidence

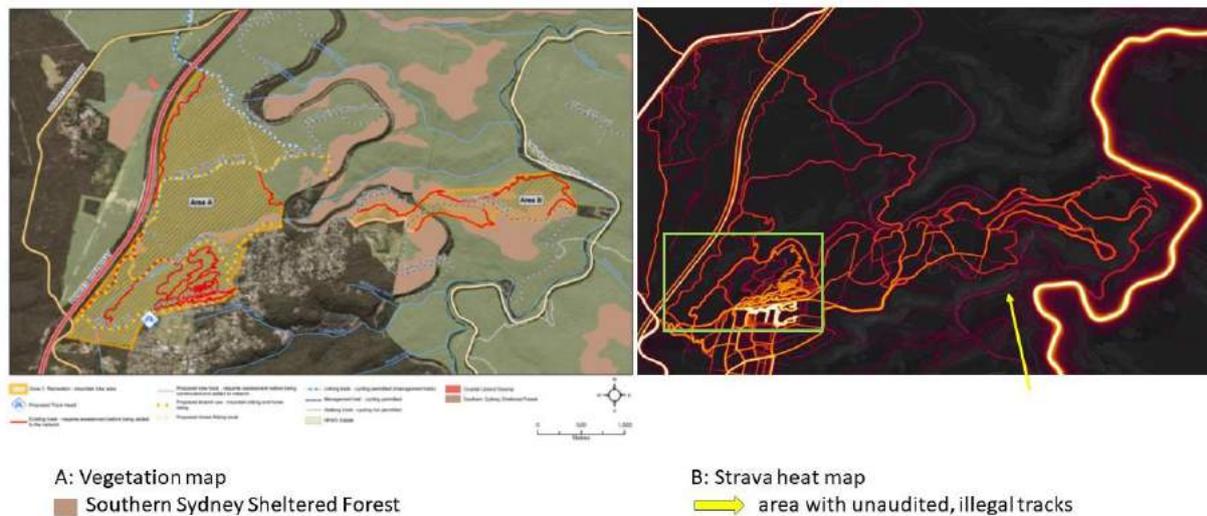
Over the past couple of decades, an **enormous expansion of unauthorised mountain bike tracks** has been observed in these reserves (See Figures 1B, 2B, 3B, 3C) **impacting flora, fauna and Aboriginal heritage sites**. This activity has been exacerbated by a well-organised and persistent campaign by mountain bike stakeholders to establish squatter's rights by building and promoting the use of unauthorised tracks via professionally-developed websites^{39, 40} and social media. The vast majority, 85% of riders using these tracks are male, predominantly between the ages of 35-54⁴¹.

Erosion, devegetation, habitat fragmentation and an amplified human incursion in fragile habitats are all well-documented effects of mountain biking in natural areas⁴² and are having observable impacts in the areas being used by mountain bikes in the three reserves. The carving up of previously intact areas by authorised tracks is shown in Figures 1-4. Fragmentation of habitat in the reserves is noted in the draft plan of management as one of the greatest threats to biodiversity along with human disturbances and illegal track construction.⁴³

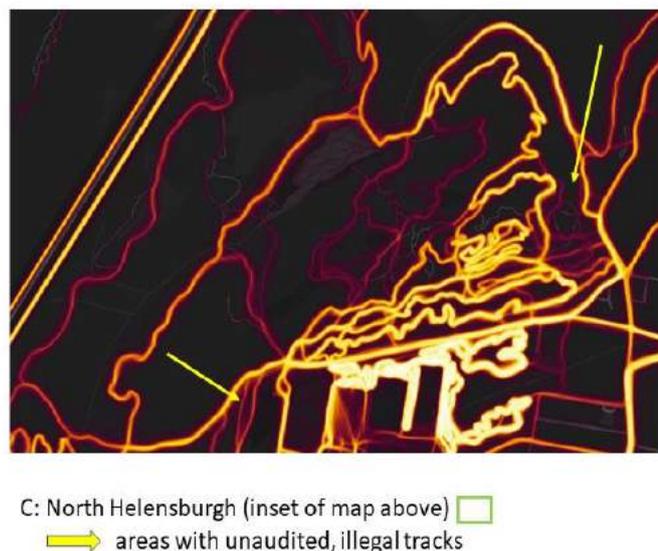
which it traverses. This is surprising given the evidence of fragmentation and damage in the Temptation Creek area. Our members attribute an increasing scarcity of wildlife in the area to the number of unauthorised tracks and bikes in the area. This includes a population of Swamp Wallabies, which Sutherland Council says will become locally extinct if the network proceeds as planned.⁴⁹

The plan does not include a map of unauthorised tracks that are not part of the proposed network or any assessment of the damage they have caused to these communities. An overlap of tracks with these communities is shown in Figures 1-4. Notable areas include the section of Temptation Creek, North/West of the approved single track (Figure 1B, blue arrow), the Royal National Park adjoining the Eastern side of East Heathcote containing a substantial section of Duffys Forest Ecological Community (Figure 2C) with large numbers of unauthorised tracks being used by mountain bikers (Figure 2D). Similarly, unauthorised tracks South Helensburgh B are causing considerable damage to a section of Southern Sydney Sheltered Forest.

Figure 3: Helensburgh



The fact that significant devegetation, erosion and fragmentation has already been caused by mountain bike activity in these areas and is not noted in the draft plan is a serious omission. There is an urgent need for closure and remediation of these tracks to protect the threatened ecological communities. Resource allocation should be directed towards this as a priority over any expansion or endorsement of tracks for mountain biking.



Mountain bikes also disseminate weeds and fungal pathogens⁵⁰. The *Considerations* document notes the detection of plant diseases phytophthora and myrtle rust in the reserves as a key threatening process under the NSW Biodiversity Conservation Act⁵¹ and states that humans have the greatest capacity to transport them. Amphibian chytrid fungus⁵² is of particular concern for the threatened species of frogs that inhabit creeks in zone 2. Opening these areas for mountain biking, as proposed in the draft plan, brings a considerable risk of introducing these diseases to vulnerable flora and fauna.

First-hand observations are provided by Environment Centre members who have regularly visited the reserves over an extended period of years to decades. Evidence of damage from mountain bike activity is substantiated by the inclusion of video links and photos to highlight the damage from mountain bike activity. We have focused on the Temptation Creek area which has been greatly impacted by >>25 km of unauthorised tracks.



Photo 1: water dragon - basking reptile in danger from being killed or injured by bikes travelling at speed on 'even flow', unauthorised bike track in Temptation Creek area.

For an instance of snake in the path of a mountain bike rider on a track at Loftus see this video, which is just one of many "promotional" videos that serve to advertise the illegal tracks: <https://www.youtube.com/watch?v=0Io1qKLDSQ0>

The snake is shown on the track at 1:46, and the video has a helpful slow motion repeat.

The ‘holy trail’ along Temptation Creek is just one example of a location that has been apidly **degraded due to devegetation, erosion, construction of features and purposeful removal of the understory by mountain bikers.**

This YouTube video was taken by someone riding this track under wet conditions: <https://www.youtube.com/watch?v=JMBDj2pBFiY>⁵³ Given that creek areas are prone to erosion due to moist soil and are **comprised of fragile ecological communities and threatened fauna including the Giant Burrowing Frog**, it is highly objectionable that the plan, while noting that this track ‘retains moisture and becomes boggy after rain’ recommends it be included in the network, albeit with modification.⁵⁴ Details on how modifications will address further degradation are not provided.

In addition, **this track passes within 3 metres of a natural rock bridge**, featured in photo 1 of the draft plan⁵⁵, **with a large number of Aboriginal sharpening grooves** (Photo 6), putting them at risk of irreparable damage.



Photo 2: trail braiding and constructed jump feature on ‘holy trail’ unauthorised track alongside Temptation Creek area.



Photo 3: bike track erosion on “holy trail” in close proximity to Temptation Creek.



Photo 4: devegetation and erosion amplified on the ‘holy trail’ due to braiding



Photo 5: tree broken by mountain bike activity on 'just huck it' - an unauthorised, steep track with significant braiding which connects 'holy trail' the Florence Pde management road. No specific mention is made of this track in the plan.



Photo 6: natural rock bridge with sharpening grooves located < 3 metres from 'holy trail'.

Management Failures

Provision of a trial single-track has not been successful in curbing illegal track building.

An enormous number of unauthorised tracks have been formed and used by mountain bikers since the trial 6 km single track was opened for mountain biking in 2002. Many of these tracks originate from the trial track (Figures 1A, 2A, 2D). The results of the trial have never been released or publicised.

Vandalism by members of the mountain biking community is common and has been beyond the capacity of NPWS to manage. In addition to purposeful removal and damage of vegetation, construction of features and erosion (noted in the above section, names of numerous unauthorised tracks have been spray painted onto rocks or nailed into trees (Photo 7, 8). Many of these were removed by Park management after they were reported in 2006, however, some were not removed and new ones have appeared. Large-scale features have been illegally constructed in various areas of the reserves (Photos 9, 10) and are not removed despite NPWS being informed of their existence.

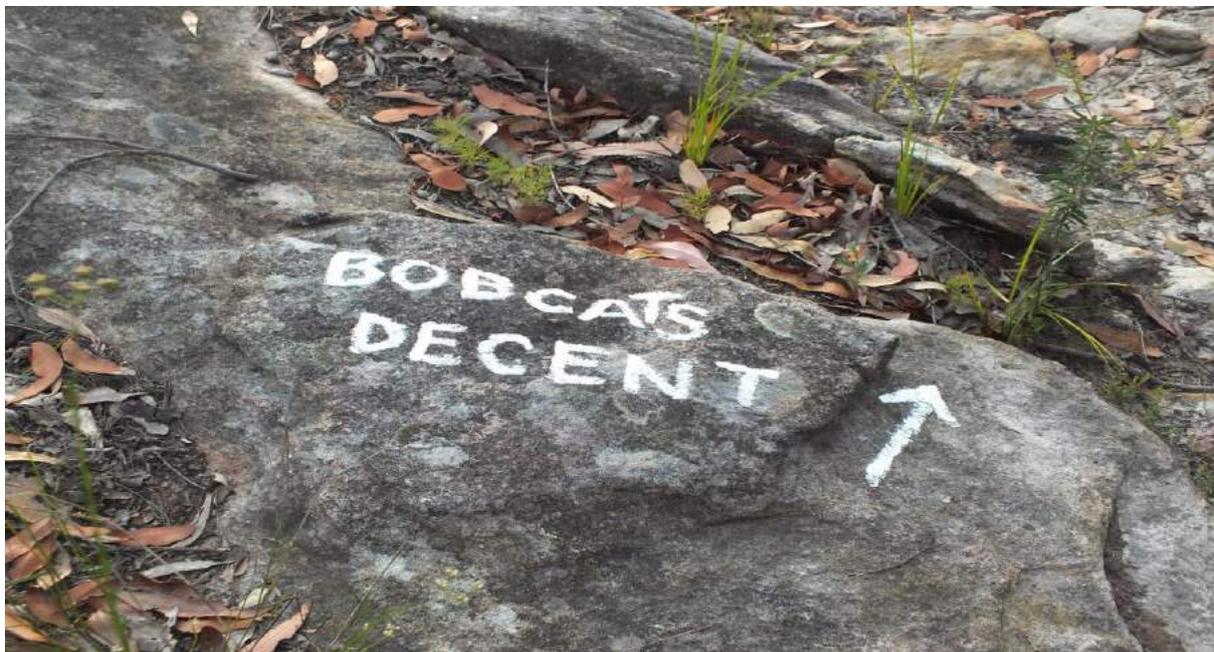


Photo 7: spray painting on rocks to label unauthorised track. This sign was reported to park management in 2006 but has not been removed.



Photo 8: sign nailed into tree to label unauthorised track. A previous sign for this track was removed by park management.



Photo 9: Royal National Park, Goarra Ridge East Heathcote (Photo by Ian Hill)



Photo 10: Heathcote National Park (Photo by Ian Hill)

All attempts by NPWS to close and remediate unauthorised mountain bike tracks have been unsuccessful. NPWS signage and barriers erected to close tracks are vandalised and removed, sometimes within days. This included a sign on the ridge above the junction to Savilles and Temptation Creek that designated a path as ‘no mountain bikes - walkers only’ and included an explanation that biking activity on the steep slope causes erosion that harms the habitat of the Giant Burrowing Frog, a threatened species. The sign was removed by vandals within a month of installation. The pole remains but the sign has never been replaced despite requests from our members (photo 11).

At least 3 other signs on the Temptation Creek Management road were erected by Park management at the trailheads of unauthorised tracks to inform riders that they were closed. The signs were vandalized / removed within months although the posts remain (Photos 12, 13, 14).



Photo 11: Vandalism of NPWS sign specifying ‘no mountain bikes - walkers only’ with educational information about the Giant Burrowing Frog. Savilles Creek and Temptation Creek ridge trail.

In addition to signage, orange webbing was installed at the trail heads of the ‘holy trail’ to close this area off to bikes. This was vandalised, cut, pushed aside and removed in less than a week. It was never replaced. A post at the head of the ‘holy trail’ near the Temptation Creek management road. The addition of a gate may have been planned, presumably to allow temporary or permanent closure of this track. It was never completed, although the post remains (Photo 15)

The inability of the NPWS or the mountain bike community to keep these problems in-check illustrates the flawed expectation that monitoring and maintenance of the track network can be facilitated by volunteers from the mountain bike community⁵⁶.



Photo 12: Vandalised signage at the junction of Temptation Creek management road, adjacent to unauthorised 'holy trail' that instructed 'walkers only'.



Photo 13 above: Vandalised signage at the junction of Temptation Creek management road that indicated unauthorised 'Savilles Creek' track closure.



Photo 14: Vandalised signage at the junction of Temptation Creek management road that instructed 'walkers only' for the 'Temptation Creek Savilles connector' trailhead.



Photo 15: graffiti sign spray painted onto rocks and post indicating a never completed plan to close the unauthorised 'holy trail.

Increased risk of injury to riders, walkers and wildlife. There is already considerable conflict between walkers and cyclists using tracks in the three reserves. This is not surprising given that 34% of mountain bikers are motivated by 'excitement and risk' compared to 3% of walkers⁵⁷. Our members have reported numerous near misses by bikes speeding on tracks with their riders unwilling to give way to walkers. **Compliance with the IMBA Code of Conduct is highly unlikely without enforcement.** (See photo 16)

Electric assist mountain bikes are becoming more common and will increase the likelihood of injury due to their increased weight and speed. **The provision of black tracks, such as Bobcats and Even Flow, that cater for advanced riders is ill-advised and dangerous.** As noted in the 2015 Trail Audit report, 'Emergency access to some areas of the Royal National Park site will be quite problematic due to long sections of isolated trail, steep slopes and challenging rocky terrain'.⁵⁸ The hazards that the single-width tracks pose to riders, walkers and wildlife (Photo 1) and the risk of litigation are indicative of a poorly assessed plan.

Night-time riding is problematic. Groups of riders with bright lights are riding through the park at night impacting on the behaviour of nocturnal fauna and increasing the risk of impact and injury/death of vulnerable species, such as the broad-headed snake⁵⁹ as well as to other park users. This activity is likely to increase as 79% of survey respondents expressed a desire

to participate if it were officially permitted⁶⁰ yet there is no mention of how this activity will be managed in the draft plan.



Photo 16 and 17: near “Bobcats” around the Temptation Creek zone, a barely averted collision – this bike is travelling so rapidly the walker has only just a second to move before she is forced off the narrow track. These photos do not convey the speed. Bikes travelling at this speed ensure these tracks are no longer safe or peaceful for walkers. The risk and likelihood of accidents is increased, especially for elderly walkers or parents with small children.

In other videos which promote and showcase other unauthorised tracks this rider congratulates and thanks illegal track builders. The near collision starts from 0:16 <https://www.youtube.com/watch?v=csLYpAqc1VM>

Issues with non-Compliance are acknowledged in the plan with a suggestion that they will be solved by better mapping, signage of tracks and encouraging self-regulation among user groups. The above evidence indicates that none of these measures have been successful in the past and it is counter-intuitive to think that building an even larger network will assist with compliance and management.

Mountain bikers who prefer the excitement of single tracks to challenge their technical skills are unlikely to remain on a network of approved tracks. Instead they will seek continued novelty by developing additional unauthorised tracks. Finite resources should be directed towards the closure and remediation of unapproved tracks as proof that this can be done successfully before any expansion to the network is considered.



Photos 18 and 19: 'feature building' at a Temptation Creek trail, near the Florence Creek trail, ramps and planks drilled into the rockface, and nearby graffiti spray painted on the rock.



Recommendations concerning the draft Mountain Bike Plan of Management

- No expansion of a single-track network and closure and remediation of existing unauthorised tracks, including those not accounted for in the DirtArt Audit. Tracks in culturally and ecologically sensitive areas should be closed as a priority. Mountain biking is best restricted to existing fire management trails which are of a width that is compatible with the speed at which bikes travel. Single tracks (whether bi-directional or one way) are too narrow and cannot safely cater for both cyclists and walkers.
- As a priority NPWS should work with companies that have apps showing illegal mountain bike trails to have those trails removed from the apps. Currently the plethora of trails shown only serves to promote and advertise illegal activities. i.e. advertised as suitable for mountain biking - advertising illegal trails should be illegal.
- The NSW Office of Sport and Recreation should identify alternative locations for single track and advanced level mountain biking in areas that are not set aside for environmental conservation. We note the success of Mill Creek⁶¹ which is located on reclaimed land in Lucas Heights and has been operating with volunteers and the assistance of Sutherland Council since 2012. Commercial forests have been recommended as ideal locations as they are less fragile environments and do not pose the same threats to conservation⁶². Private landholders may also be amenable to a fee-based system for mountain biking on their land. Expansion of mountain bike tracks on public lands should be delayed until the draft NPWS State cycling plan is completed and an EIS should be required before granting approval.
- Better policing of illegal tracks is urgently needed. In particular, the frequent monitoring and prompt closure of illegal tracks when they are built and issuing of fines to people building or using them. An increase in staff/rangers and resources is required.
- Clear signage and maps, both online and at the visitor centre should clearly indicate to visitors which tracks are allowed to be used by bikes. Signage that is damaged or removed needs to be promptly replaced.
- An education program is required to ensure local bike shops and schools are fully cognisant of which tracks are legal and which are not. This program needs to be run annually to inform new school groups that participate in mountain biking as an elective sport.
- Park Values and conservation requirements of the Wildlife Act should eliminate consideration of mountain biking events due to large environmental impact and conflict with other users.
- Consider implementing a registration system for bikes to assist rangers with compliance. QR codes could be posted at trailheads with a requirement for cyclists to register before entering.

Port Hacking additions to the Royal National Park Estate

The Hacking River runs for 42 km starting 2 km west of Stanwell Tops, through the Royal National Park, to Port Hacking Point. The natural beauty and diversity of plants and animals in and around the Royal National Park watercourses leading to Port Hacking is exceptional, and a critical part of the overall Port Hacking estuary ecosystem.

As an integral part of the Royal National Park ecosystem we submit that key areas of Port Hacking adjacent to the Royal National Park be incorporated in the Royal National Park Estate: in particular the water, marine beds and intertidal shoal areas of Cabbage Tree Basin, Southwest Arm, the tidal sections of the Hacking River and Deeban Spit. Ideally this would be expanded to include all intertidal zones adjacent to the Royal National Park.

The Port Hacking estuary is a complex and dynamic environment, with sand shoals that shift and move. The intertidal waters and shoal areas around the Royal National Park feature endangered Posidonia seagrass⁶³, endangered Coastal Saltmarsh⁶⁴, a diminished and shrinking number of molluscs and shellfish⁶⁵, as well as endangered and critically endangered shorebirds listed under both State and Federal environmental protection laws.

The Environmental Protection and Biodiversity Conservation Act refers to the need to protect species which inhabit this area as a ‘matter of national environmental significance’.⁶⁶ Australia is also a signatory to several international agreements which seek to protect migratory shorebirds (the Bonn Convention, Ramsar Convention, JAMBA, CAMBA, ROKAMBA). The Deeban Spit tidal flats are critical habitat for these birds, used by them for both roosting and feeding. Shorebirds that regularly inhabit the area which have NSW / Federal / International Union for the Conservation of Nature Red List Status include -

Eastern Curlews	- Critically endangered
Sanderling	- Vulnerable
Red Knot	- Endangered
Curlew Sandpiper	- Endangered
Osprey	- Vulnerable
Terek Sandpiper	- Vulnerable
Little Tern	- Endangered
Bar-tailed Godwit	- Vulnerable
Pied Oystercatcher	- Endangered
Sooty Oystercatcher	- Vulnerable
Sooty Tern	- Vulnerable ⁶⁷

Port Hacking itself sits within the parameters of the NSW government’s Coastal Management planning framework - the State Environmental Planning Policy (Coastal Management) 2018. Under this Policy Sutherland Shire Council is responsible for preparing an overall estuary plan for the Hacking⁶⁸, but this has not been done. Council reports indicate that funding to begin drawing up a plan is not expected to be available until 2022-3.⁶⁹

While there is no overall estuary plan in place, Port Hacking is under the jurisdictional control and management of both state and local government. The Intertidal Zone (ITZ) is Crown land, and as such falls under the purview of the Crown Land Management Act⁷⁰. Sutherland Shire Council only has authority to the high tide mark. Other state government agencies have management responsibilities of the waterways. Roads and Maritime is concerned with maritime safety and regulations; the Department of Primary Industries is concerned with fish and fishing. These agencies work separately and are concerned with regulations and compliance as opposed to an overall management plan for the ecosystem. Regulations intended to protect endangered plants and animals in Port Hacking are failing to prevent species decline.

Sutherland Shire Council does assist with public awareness campaigns and protection for endangered and critically endangered shorebirds, but feral animals are an ongoing problem. Deer are shredding the coastal saltmarsh: this vital habitat for a range of species is being destroyed. Dogs are frequently brought into areas they are not supposed to go, and the Deeban Spit tidal flats are being treated as a dog park: Council only has authority to the high tide mark which leads to problematic issues with compliance. The area requires effective, informed, and responsible management that considers the ecosystem as a whole.

Another example illustrating the need for the Deeban Spit area to be included within the purview of NPWS management was evidenced by recent events that impacted the Bonnie Vale precinct. Heavy rain inundated Cabbage Tree Basin in early 2020. Around the same time, high tides, rough seas, and shifting sand shoals conspired to block the Cabbage Tree Creek entrance to the Basin. There were public calls to protect the ecosystem, debate as to whether intervention was required to prevent plants and animals dying, whether Cabbage Tree Basin was an intermittently open and closed lagoon (ICOLL), and what actions should be taken if that was the case.⁷¹ (Despite ongoing concern about mangrove die-back, from the 1930s the reduction of the amount of seagrass and coastal saltmarsh has been the most profound change in the Basin; the mangroves have grown five-fold.⁷²) When a new entrance to the Basin finally opened, strong altered tidal flows compromised the Bonnie Vale campground, requiring sand / rock bags to be put in place by NPWS (no doubt at considerable cost) in an effort to stop much of the beach area and part of the campground from washing away. **Climate change and sea level rises will only exacerbate such events.**

As the management of this area is under review we suggest one option that be considered in keeping with the principle of adaptive reuse is an environmentally friendly seawall similar to the one installed with the Carss Bush Park Channel and Foreshore Naturalisation project, “marine habitat to “reintroduce saltmarsh, mangrove and intertidal rock platform habitats using sandstone terraces and concrete structures”.⁷³ Such a seawall would allow easier access to the water, seating and picnicking. It could be designed to ‘speak’ to the heritage 1921 seawall. The ongoing use of unattractive sandbags is an indictment on the planning mishmash of that whole area, multiple agencies etc.

It requires informed planning to protect endangered flora and fauna, to support visitation, to educate the public, to take into account and manage flow on impacts through the dynamic and changing Port Hacking intertidal ecosystem as a whole. The Royal National Park is adjacent to the Port Hacking intertidal areas so it is a better fit and would reduce inter-government agency duplication to have these fall under one management plan. Successful management of the ecology by NPWS would of course require additional resource allocation.



Spring Gully - recommendation for strategic acquisition

Spring Gully is 5.6 hectares of pristine gully forest and wetland at Bundeena which originally belonged to the Scouts and was offered to the NPWS for acquisition in 2011. In 2013 the NPWS approved its purchase for addition to the Royal National Park. Spring Gully was instead purchased by the current owner who is proposing to clear over four hundred trees, of which at least fifty-five are significant hollow bearing trees, within known Eastern pygmy possum habitat. The intent is to construct a residential dwelling and six safari tents for twelve tourists. The NSW Office of Environment and Heritage has described Spring Gully as “a rich mosaic of endangered ecological communities listed under the Threatened Species Conservation Act”.

We ask that NPWS recommend this land be protected; request that the Minister cancel the access license through the Royal National Park which enables this development, and ask that Spring Gully be purchased as a proper extension of the Royal National Park.

Professor David Keith from the University of New South Wales has advised that the proposed development, including the proposed access road upgrade through the Royal National Park, poses direct impacts to a number of Endangered Ecological Communities: critically endangered Eastern Suburbs Banksia Scrub; has indirect impacts on Bangalay Sand Forest; Sydney Freshwater Wetland; Swamp Sclerophyll Forest; and Coastal Upland Swamp. He has described the local occurrence of Eastern Suburbs Banksia Scrub on this land as significant.

In 2014 the Mayor of Sutherland Shire Council wrote to local members of parliament stating “The land is a logical extension to the Royal National Park”. In 2016, Rob Stokes, the current Planning Minister, wrote to the Nature Conservation Council stating “Should the owner wish to sell the property I would be pleased to advocate for its purchase by Government if reasonable. I am aware of the values of the site”.

Endnotes

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- ¹ *NSW National Parks and Wildlife Service, Royal National Park, Heathcote National Park and Garawarra State Conservation Area Discussion Papers, Summary of submissions*, 2019, NSW Department of Planning, Industry and Environment, p.6, p.8
- ² *Royal National Park, Heathcote National Park & Garawarra State Conservation Area Draft Plan of Management*, 2021, NSW Department of Planning, Industry and Environment, p.4 (hereafter, *Draft Plan of Management*)
- ³ *Draft Plan of Management*, 2021, pp.8-9
- ⁴ *Draft Plan of Management*, 2021, p.7
- ⁵ *Draft Plan of Management*, 2021, p.11
- ⁶ *Draft Plan of Management*, 2021, p.7, and “Call for more rangers to manage six million visits a year to Royal National Park” in *The Leader*, 13 August, 2019
- ⁷ *The Vertebrate Fauna of Royal & Heathcote National Parks and Garawarra State Conservation Area*, 2011, NSW Department of Environment, Climate Change and Water, pp. 54-61 (hereafter, *Vertebrate Fauna*)
- ⁸ *Draft Plan of Management*, 2021, p.11
- ⁹ *Draft Plan of Management*, 2021, p.8
- ¹⁰ *NSW National Parks and Wildlife Service, Royal National Park, Heathcote National Park and Garawarra State Conservation Area Draft Planning Considerations*, 2021, NSW Department of Planning, Industry and Environment, p.19 (hereafter, *Considerations*)
- ¹¹ *Considerations 2021*, p.19
- ¹² *Draft Plan of Management*, 2021, pp.23-4
- ¹³ *Vertebrate Fauna 2011*, p.188, p.190-1
- ¹⁴ *Vertebrate Fauna 2011*, p.159
- ¹⁵ *Considerations 2021*, p.23
- ¹⁶ NSW Office of Environment and Heritage, Pied Oystercatcher – profile: <https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10386>
- ¹⁷ *Draft Plan of Management*, 2021, p.7. Wildlife corridors around the Royal National Park and surrounding areas have been recognised by NPWS since the 1970s, and were formalised in the 1985 NPWS study *The Upper Hacking Catchment, a Natural Resource Survey*. Unfortunately much of this connectivity is compromised.
- ¹⁸ “Fragmentation of habitat is one of the key threats to biodiversity in the region. Retaining intact vegetation and maintaining or improving connectivity is a management priority in these parks... Together with habitat fragmentation, cats, foxes, deer and high frequency fire present the greatest threats to biodiversity.” *Draft Plan of Management*, 2021, p.11
- ¹⁹ Goldingay, R.L. 2012, “What role does ecological research play in managing biodiversity in protected areas? Australia’s oldest National Park as a case study” in *Proceedings of the Linnean Society of New South Wales* 134: B119-B134.
- ²⁰ Goldingay 2012, p.B127
- ²¹ *Considerations 2021*, p.20
- ²² <https://roads-waterways.transport.nsw.gov.au/documents/projects/sydney-north/mona-vale-road/mvr-project-update-2018-03.pdf> And <http://www.pittwateronlinenews.com/Fauna-Passes-Mona-Vale-Road-2018-Commence.php>
- ²³ *Considerations 2021*, p. 40
- ²⁴ There is also a strong gender-bias. The 2015 *DirtArt Trail Audit Report* found 85% of mountain bikers in the reserves to be male. This report was commissioned by the New South Wales Parks and Wildlife Service, NSW Office of Environment and Heritage (hereafter *DirtArt 2015 Trail Audit Report*)
- ²⁵ The 2010 *NPWS Cycling Policy Review and Sustainable Mountain Biking Strategy* discussion paper found 4% of park visitors are cyclists. In the Dirt Art survey referenced in the discussion paper, the respondents who indicated an historical preference for cycling on unsealed roads/tracks (Table 2) ranged between 11% and 20%. Based on this, the proportion of cyclists in national parks who require the type of facilities posed in the strategy, would be at most 20% of the cyclists who are park visitors. That is, 0.8% or less of park users. The number of mountain bikers in the three reserves has increased since 2010 due to a lack of compliance measures and should not be used to justify the expansion. NSW Department of Environment, Climate Change and Water, 2010,

<https://www.environment.nsw.gov.au/resources/parkmanagement/10769cyclingmbikedp.pdf>

²⁶ *DirtArt 2015 Trail Audit Report*

²⁷ *DirtArt 2015 Trail Audit Report*

²⁸ “Dirt Art has led the design of over 4,000km of trails, and construction of over 1,000km of trails across hundreds of projects throughout Australia and around the world.” Dirt Art: <https://www.dirtart.com.au/services/>

²⁹ Goeft, U. and Alder, J. 2001, “Sustainable mountain biking: a case study from the southwest of Western Australia” in *Journal of Sustainable Tourism* 9: 193-211

³⁰ Bionet Atlas <http://www.bionet.nsw.gov.au/>

³¹ Burgin, S. and Hardiman, N. 2012, “Is the evolving sport of mountain biking compatible with fauna conservation in national parks?” in *Australian Zoologist* 36 (2): 201–208

³² Catling PC and Burt RJ. 1995, “Why are red foxes absent from some eucalypt forests in eastern New South Wales?” in *Wildlife Research* 22, 535-545.

³³ Knight, R.L. and Cole, D.N. 1995, “Wildlife responses to recreationists” in *Wildlife and Recreationists: Coexistence through Management and Research* edited by R.L.Knight and K.J. Gutzwiller, Island Press, Washington DC.

³⁴ *Vertebrate Fauna* 2011, p.191

³⁵ Pickering CM, Hill W, Newsome D, Leung YF. 2010, “Comparing hiking, mountain biking and horse riding impacts on vegetation and soils in Australia and the United States of America” in *Journal Environmental Management* 91(3): 551-62

³⁶ *Vertebrate Fauna* 2011, p.192

³⁷ *NSW National Parks and Wildlife Service, Royal National Park, Heathcote National Park and Garawarra State Conservation Area Draft Mountain Biking Plan*, 2021, NSW Department of Planning, Industry and Environment, p.9, p.21 (hereafter *Draft Mountain Biking Plan*)

³⁸ *DirtArt 2015 Trail Audit Report*

³⁹ Trailforks Mapping Inc. Royal National Park Mountain Biking Trails: <https://www.trailforks.com/region/royal-national-park-9807/?activitytype=1&z=12.3&lat=-34.09026&lon=151.02818>

⁴⁰ Singletracks: Mountain bike trails > Australia > New South Wales > Sutherland > Royal National Park <https://www.singletracks.com/bike-trails/royal-national-park-2/>

⁴¹ *DirtArt 2015 Trail Audit Report*

⁴² Burgin, S. and Hardiman, N. 2012 “Is the evolving sport of mountain biking compatible with fauna conservation in national parks?” in *Australian Zoologist* 36 (2): 201–208

⁴³ *Draft Plan of Management*, 2021, p. 11

⁴⁴ Goeft, U. and Alder, J. 2001. “Sustainable mountain biking: a case study from the southwest of Western Australia” in *Journal of Sustainable Tourism* 9: 193-211.

⁴⁵ Pickering CM, Hill W, Newsome D, Leung YF. 2010, “Comparing hiking, mountain biking and horse riding impacts on vegetation and soils in Australia and the United States of America” in *Journal Environmental Management* 91(3): 551-62

⁴⁶ Knight E.H. and Fox B.J. 2000, “Does habitat structure mediate the effects of forest fragmentation and human-induced disturbance on the abundance of *Antechinus stuartii*?” in *Australian Journal of Zoology* 48: 577-595

⁴⁷ Knight, R.L. and Cole, D.N. 1995, “Wildlife responses to recreationists” in *Wildlife and Recreationists: Coexistence through Management and Research* edited by R.L.Knight and K.J. Gutzwiller, Island Press, Washington DC.

⁴⁸ Burgin, S. and Hardiman, N. 2012 “Is the evolving sport of mountain biking compatible with fauna conservation in national parks?” in *Australian Zoologist* 36 (2): 201–208

⁴⁹ Sutherland Shire Council: Shire Strategic Planning Committee Business Paper, 12 July 2021, p.268 <https://cms.ssc.nsw.gov.au/files/sharedassets/website/document-library/governance/council-meetings/2021-07-12-pln-business-paper.pdf>

⁵⁰ Pickering CM, Hill W, Newsome D, Leung YF. 2010, “Comparing hiking, mountain biking and horse riding impacts on vegetation and soils in Australia and the United States of America” in *Journal Environmental Management* 91(3): 551-62

⁵¹ *Considerations* 2021, p.23

⁵² *Vertebrate Fauna* 2011, p.191

⁵³ Please note there are many other videos promoting illegal tracks:

<https://www.youtube.com/watch?v=JMBDj2pBFiY>

⁵⁴ *Draft Mountain Biking Plan* 2021, p.8

⁵⁵ *Draft Mountain Biking Plan* 2021, p.4

⁵⁶ *Draft Mountain Biking Plan* 2021, p.22

⁵⁷ Chiu, L. and Kriwoken, L. 2003 “Managing Recreational Mountain Biking in Wellington Park, Tasmania, Australia” in *Annals of Leisure Research*, 6:4: 339-361

⁵⁸ *DirtArt 2015 Trail Audit Report*

⁵⁹ *Vertebrate Fauna* 2011. The Broad headed snake is officially listed as Endangered in NSW, at risk of extinction, and the suggested advice for Broad headed snake rock habitat is to “Limit vehicle and pedestrian access to and recreational use of sandstone escarpments where this species occurs.”

<https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10413>

The Royal National Park is listed as a “priority management site”

⁶⁰ *DirtArt 2015 Trail Audit Report*

⁶¹ Sutherland Shire Council, Mill Creek Mountain Bike Trails:

<https://www.sutherlandshire.nsw.gov.au/Outdoors/Sport/Cycling/Mill-Creek-Mountain-Bike-Trails>

⁶² Hardiman N. and Burgin, S. 2013 “Mountain biking: downhill for the environment or chance to up a gear?” in *International Journal of Environmental Studies*, 70:6: 976-986

⁶³ “Populations of *Posidonia australis* in Port Hacking, Botany Bay, Sydney Harbour, Pittwater, Brisbane Waters and Lake Macquarie have suffered such a large reduction in abundance and geographic distribution that they have been listed as endangered populations under the threatened species schedules of the NSW Fisheries Management Act 1994. This loss is likely to have had significant historical and ongoing impacts on marine and estuarine biodiversity and productivity as *Posidonia australis* plays an important role in providing nursery areas, feeding grounds and shelter for many aquatic animals.” NSW Department of Primary Industries:

https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0007/635857/Endangered-populations-of-Posidonia-australis.pdf

For a further information of a specific study on the loss of seagrass and coastal saltmarsh in Cabbage Tree Basin and Port Hacking see also Williams R.J. and Meehan A.J. 2004, “Focusing management needs at the sub-catchment level via assessments of change in the cover of estuarine vegetation, Port Hacking, NSW, Australia” in *Wetlands Ecology and Management* 12: 499–518

⁶⁴ Coastal Saltmarsh is listed as endangered under the NSW Biodiversity Conservation Act, and as an “Endangered Ecological Community”: “Due to the reduction in the extent of saltmarsh in New South Wales and ongoing threats to its survival, Coastal Saltmarsh has been listed as Endangered Ecological Community (EEC) under the Threatened Species Conservation Act 1995.” NSW Department of Primary Industries:

https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0007/459628/Coastal-Saltmarsh-Primefact.pdf

⁶⁵ There are restrictions around Cabbage Tree Point and the area from Simpsons Beach at Bonnie Vale to Costens Point which is “closed to the taking of all shellfish including pipis, mussels, oysters, cockles, whelks and turban snails”. NSW Department of Primary Industries:

https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0020/614522/recreational-fishing-guide-sydney-south.pdf

Reports from Sutherland Shire Environment Centre members indicate these restrictions are not working. Little research or monitoring of local populations appears to have been carried out.

⁶⁶ *EPBC Act Policy Statement 3.21—Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species*, Commonwealth of Australia 2017

<http://www.environment.gov.au/system/files/resources/67d7eab4-95a5-4c13-a35e-e74cca47c376/files/bio4190517-shorebirds-guidelines.pdf>

⁶⁷ Further information relating to Shorebird distribution in Port Hacking is available from the Birdlife Australia Shorebird database: <https://birdlife.org.au/projects/shorebirds>

⁶⁸ “Coastal management programs set the long-term strategy for coordinated management of the coast ... they are prepared by local councils in consultation with their communities and relevant public authorities.”

NSW Department of Planning, Industry and Environment:

<https://www.environment.nsw.gov.au/topics/water/coasts/coastal-management/framework>

⁶⁹ Sutherland Shire Council has noted that “Based on current resources and timeframes for applying for grant funding, a CMP [Coastal Management Plan] for Port Hacking cannot commence until 2022.” Shire Infrastructure and Public Domain Committee Business Paper, 13 July 2020, p.19

<https://www.sutherlandshire.nsw.gov.au/files/sharedassets/website/document-library/governance/council-meetings/2020-07-13-inf-business-paper.pdf>

⁷⁰ The Crown Land Management Act is administered by the NSW Department of Planning, Industry and Environment. It is an offence to pollute or contaminate “Crown land or waters”: NSW Department of Planning, Industry and Environment, DOC18/071673, October 2019

https://www.industry.nsw.gov.au/_data/assets/pdf_file/0006/161547/Greater-powers-to-stop-illegal-activity-on-Crown-land-fact-sheet.pdf

⁷¹ “Council rejects claims Cabbage Tree Basin in Port Hacking is dying” in *The Leader* 10 March, 2020

<https://www.theleader.com.au/story/6670448/debate-over-basins-health/>

⁷² Williams R.J. and A.J. Meehan 2004, “Focusing management needs at the sub-catchment level via assessments of change in the cover of estuarine vegetation, Port Hacking, NSW, Australia” in *Wetlands Ecology and Management* 12: 499–518

⁷³ “Georges River Council opens stage of Carss Bush Park Channel and Foreshore Naturalisation project” in *The Leader*, 25 September, 2019

<https://www.theleader.com.au/story/6403814/great-wall-of-carss-parks-marine-habitat-project/>

⁷⁴ Google maps: <https://www.google.com.au/maps/place/Camp+Gully+Rd,+Helensburgh+NSW+2508/@-34.1878309,150.9959146,1695m/data=!3m1!1e3!4m5!3m4!1s0x6b12dd105c3527ed:0x7ad633325ac483f18m2!3d-34.1888272!4d150.9909739>

⁷⁵ Trevor Brown & Associates, 2016, *Independent Environmental Audit - Metropolitan Coal, May 2015*, Report: MC/REV2/JANUARY2016, p.64 -

https://peassetstorage.blob.core.windows.net/assets/files/operations/australia/metrop/2016/1601_metropolitan%20independent%20environmental%20audit%202015%20final.pdf

⁷⁶ *Metropolitan Coal 2016 Annual Review*, Project No. MET-08-08/8.1, Document No. 00855774, Peabody Energy Australia Pty Ltd, see p.115

<https://www.peabodyenergy.com/Peabody/media/MediaLibrary/Operations/Australia%20Mining/New%20South%20Wales%20Mining/Metropolitan%20Mine/Metropolitan-Coal-2016-Annual-Review.pdf>

⁷⁷ NSW Environment Protection Authority, POEO Public Register, Non-Compliance detail Licence number: 767, Annual Return Jan 2009 – Dec 2009

<https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?id=767&periodid=30540&searchrange=licence&option=noncompliance&range=POEO%20licence>

⁷⁸ Mosley 2012, *The First National Park: a natural for World Heritage*, Envirobook, p.134. See also Albani, A.D. and Cotis, G. 2013, *Port Hacking: Past and Present of an Estuarine Environment*, ISBN 978-0-7334-3376-4, p.324

⁷⁹ The Hills Bark Blower: <https://barkblower.com.au/projects/metropolitan-colliery/>

⁸⁰ “Peabody reopening Australia’s Metropolitan coal mine” in *Argus Media*, 3 May, 2021

<https://www.argusmedia.com/en/news/2211254-peabody-reopening-australias-metropolitan-coal-mine>

⁸¹ Trevor Brown & Associates, 2016, *Independent Environmental Audit, May 2015 - Metropolitan Coal*, REPORT: MC/REV2/JANUARY2016, p.64

https://peassetstorage.blob.core.windows.net/assets/files/operations/australia/metrop/2016/1601_metropolitan%20independent%20environmental%20audit%202015%20final.pdf

⁸² “Toxic water from old mine entering Sydney’s drinking catchment, research warns”, *ABC News*, 21 August, 2017: <https://www.abc.net.au/news/2017-08-21/toxic-water-entering-sydneys-drinking-catchment-warning/8824650>

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⁸⁴ “Mine pollution levels in Blue Mountains could be some of world’s worst, insect species dying out”, *ABC News*, 26 Feb 2017: <https://www.abc.net.au/news/2017-02-26/blue-mountains-pollution-mine-wollangambe-river/8303644>

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