

Submission – Environmental Impacts

Broader Western Sydney Employment Area





Cover photo: *Vegetation likely to be cleared under the proposed BWSEA.*

Above: Development at nearby Oran Park – an area not considered ‘bushland’. It is the landscape-scale conversion of rural to urban land which is decimating western Sydney’s wildlife. The proposed BWSEA – with or without offsetting of ‘bushland’ areas – will clear vast areas of rural habitat and result in an unacceptably great loss to Sydney’s natural heritage.

All photos are taken from the BWSEA proposal area and Southwest Growth Centre.

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Summary

The proposal is to rezone approximately 40 square kilometers of western Sydney to develop new industrial lands. A proposal of this magnitude must be balanced with equally serious consideration for its impact on the local community and environment. Regrettably this has not been the experience with the Western Sydney Growth Centres, nor with the BWSEA proposal to date. A fundamental shift in attitude is necessary to provide true community involvement in the planning of our region.

Some key areas for consideration are considered below.

Consultation with local community groups

DP&I failed to consult with any local community environment group in the 8 year evolution of this proposal despite numerous meetings with commercial property developers (many of whom featured prominently in recent ICAC hearings).

The emerging practice of limiting ‘community’ consultation to landowners and property developers is highly inappropriate and out of step with public expectations.

Public participation is an active process. Providing an avenue to record public concerns is not public consultation. It is wonderfully ironic that the YouTube advertisement for the BWSEA (encouraging the public to ‘have your say’) has disabled comments. Similarly, the BWSEA has provided no contact for key public interest groups to correspond with – merely a portal for registering submissions. By contrast, the door is very much open for big business to liaise directly with DP&I on the BWSEA.

Genuine consultation with local community groups is desperately needed to restore public confidence in the planning process and the DP&I.

For the BSWEA this must include early engagement and serious discussions with key local environment groups including the Western Sydney Conservation Alliance and Cumberland Conservation Network.



Above: a local community wildlife tour during the former BWSEA exhibition

Ecological assessment requirements

No ecological assessment has been made of the proposal. An assessment was lodged with a former BWSEA proposal but not included in notification documents for the present proposal. This former *Biodiversity and Riparian Assessment* failed to meet basic assessment standards (refer below). A number of comments demonstrated that the authors had not even visited the area under assessment and the report was unable to estimate the extent of native vegetation in the study area.

The NSW public deserves a genuine ecological assessment for a proposal of such magnitude. Such an assessment must be done before any precinct planning to ensure that a balanced, informed proposal can be presented. In particular it is ridiculous to set targets for vegetation to be retained or offset requirements before the biodiversity of the target area has been thoroughly surveyed. This is a considerable task and will require significant resourcing.

It is understood that an ecological assessment and offset strategy will be presented on public exhibition prior to any precinct planning for the BWSEA. Confirmation of this process is formally requested.

To assist in planning for the BWSEA potential biodiversity issues and solutions for the BSWEA have been identified in this submission.

Suitable survey effort.

The subject area has not been subject to any serious biodiversity survey.

It is not valid to assess the proposal on the assumption that threatened biodiversity is present. Initially this can seem a valid, precautionary approach. However it is impossible to make serious and valid consideration for biodiversity which is merely 'assumed present'. Experience shows that field data is necessary to understand the biodiversity present and provide it real protections and offsets.

Similarly an 'assumed presence' methodology cannot assess the magnitude of impact, because there is no information on the population size of threatened species to be impacted. We are anecdotally aware that the BWSEA region is key habitat for the Swift Parrot and Regent Honeyeater. However without surveys it is impossible to estimate the populations of these species and therefore impossible to have any meaningful discussions about the impact on these species.

The NSW OEH has developed scientifically-developed guidelines for field survey effort. The relevant sections have been extracted as Appendix one of this submission for convenience.

The entire BWSEA region must be surveyed according to these survey effort guidelines so that the DP&I and the public can make a true assessment of the impact of the proposed activity.

Derived native grasslands

Refer also to 'Offsetting' below.

Most native vegetation in the BWSEA consists of native pasture with scattered trees. In NSW this is classified as critically endangered Cumberland Plain Woodland despite the absent or sparse canopy. The open woodland/grassland habitat makes aerial interpretation impossible, and as a result most of the critically endangered vegetation in the BWSEA is currently not mapped.

The former ecological report demonstrates a comprehensive misunderstanding of the ecology of Cumberland Plain Woodland as a grass-forb ecosystem, and instead focusses on the density of canopy cover. The majority of diversity in the Cumberland Plain is at ankle height, and the most diverse flora and fauna on the Cumberland Plain are found in areas with little or no canopy cover. Classic examples of this rule include Faulkland Crescent Reserve (Kings Park), areas of Camden Golf Club (Narellan) and the Tyson Rd grasslands (within the former BWSEA area at Greendale).

From my experience on-the-ground in this region, I estimate that at least half the Cumberland Plain Woodland present has little or no canopy cover and is not mapped. This figures presented in the Biodiversity and Riparian Assessment are based on canopy-cover mapping only and cannot be used for any assessment purposes.

It is important to note that many grasslands are slashed or grazed on a rotational basis (hence the lack of canopy). The *apparent* diversity of these remnants is strongly dependent on the

timing of these activities. For example at Central Gardens (Merrylands) the *detectable* species diversity of grassland increased from 50 to 120 species post-slashing. The BWSEA must clearly consider that diversity will typically be more than double that recorded at the time of survey.

Because grassland and regenerating remnants are not mapped we presently have no valid ecological information on which to consider the necessary areas for protection or the scale of offsets needed. From my field experience, I can confirm that these grasslands include populations of threatened flora (including *Grevillea juniperina* subsp. *juniperina* and *Marsdenia viridiflora* var. *viridiflora*) and are key habitat for rare and threatened fauna including the Speckled Warbler and Jacky Winter.



Above: unmapped and thinly treed vegetation is frequently of high management viability and key habitat for endangered fauna

Viability mapping

The 'viability' mapping presented in the former biodiversity report is unfounded and must be replaced by field validated data. The rule set presented for viability mapping has a single input which is 1990s air photo mapping of canopy density. In the Cumberland Plain canopy density is **not** positively correlated with management viability or with diversity or fauna value. As case in point some 'high viability' stands presented in the *Biodiversity and Riparian Assessment* are in

fact African Olive infestations on exotic pasture. Conversely, some of the most diverse flora & fauna in the BWSEA study area are grasslands which are not mapped as vegetation at all.

The viability mapping as an assessment tool must be replaced. There is no alternative for on-ground studies of flora and fauna by competent ecologists to inform conservation planning for the BWSEA.

Offsetting considerations

Offsetting derived native grasslands

For the purposes of this submission the term ‘offsetting’ is used to refer to the in-perpetuity conservation of land to mitigate development elsewhere. Such actions do not of course offset habitat loss and they result in real (and heavy) net loss of biodiversity. While technically these are mitigation measures they will be referred to here as offsetting to reflect the use by OEH and for convenience.

Any offsetting calculations need to include the full gamut of biodiversity lost. This requires offsetting calculations to incorporate considerable habitat not presently mapped as native vegetation.

It is therefore critical that on-ground survey is conducted to determine the extent of this vegetation before any negotiations regarding offset requirements for the BWSEA.

Unfortunately the BioBanking Methodology in NSW is not well suited to the assessment of structurally open woodland on the Cumberland Plain. This has two unintended outcomes:

- Few or no offsets are typically generated to compensate for the loss of grassy ecosystems
- Offset sites operating under the BioBanking methodology are required to achieve woody thickening which is resulting in a loss of native woodland species

These problems will require three responses from the BWSEA:

- On-ground survey of native grassland on all participating properties to determine the extent of native grassland vegetation, prior to any negotiations regarding offset requirements
- Calculation of offsets for native grassland loss
- Provisions to ensure that offset sites are (and remain) suitable for the threatened open woodland specialist species which will be impacted by the BWSEA

Ensuring offsets are suitable for the biodiversity impacted

Offset sites in hilly woodland on the western and southern edges of the Cumberland Plain (Razorback to Brownlow Hill) are **not** quality habitat for Swift Parrot or Regent Honeyeater.

Offsets for these species must be restricted to equivalent high quality habitat on fertile flats of the Cumberland Plain. The financial implications for an offset fund must be considered. The Growth Centres policy of removing Shale Plains Woodland on fertile flats and ‘offsetting this’ with Moist Shale Woodland on marginal slopes was financially attractive. However it did not provide any genuine assistance for the biodiversity that has been impacted.

Similarly consideration is needed to ensure that offset sites are suitable for Jacky Winter and migratory robin species like the Scarlet Robin. These require structurally open habitat, whereas the BioBanking methodology requires structural thickening of offset areas.

Reporting existing biodiversity offsets

A considerable proportion of remnant vegetation in the proposed BWSEA consists of offsets for previous development. The extent of existing offset areas is significantly greater than that mapped in documentation for the previous BWSEA proposal in June 2013. For example all vegetation remaining at Twin Creeks is gazetted offset area for bushland clearing on that property, and similar offsets exist on the Austral Bricks land holding south of Wonderland on the western side of Wallgrove Road.

The existing offset areas must be honored by the BWSEA assessment. They should be classified as ‘existing offset areas’ and not sneak into the figures of vegetation to be retained as has occurred with the GCC.

The FAQs reports that ‘*approximately 254 hectares has already been preserved*’. This is a reference to existing offsets in the BWSEA. As well as being a significant underestimate, this is highly misleading and suggests the BWSEA has protected these lands. Future references to existing offsets must accurately represent the facts, for example:

Former bushland clearing has resulted in XXXX hectares of existing offsets which will be additional to offsets for any future development.

The BWSEA must ensure at all times that reporting acknowledges existing offsets clearly. Again it is critical that calculations of existing offset areas do not sneak into the figures of vegetation to be ‘retained’ or ‘protected’. Instead they should be clearly identified as existing offsets for previous land clearing.

Existing offset shortfall

Some former WSEA developments were approved under the EPBC on the provision of a collective 100 ha offset area. These developments proceeded and no amendment or revocation of this offset has been granted. Subsequent developments were approved on a basis of a 60 ha offset however these did not modify the former approvals. We presently have a 40 ha offset deficit. Unless the WSEA region is excluded from the BWSEA these offset deficits must be acknowledged and fulfilled through the BWSEA process.

State vs Federal offset requirements

It is important to note that the BioBanking offset ratios and guidelines are not founded on any published research. They are a legislative tool, and typically do not provide a no-net-loss outcome. In particular, they conflict with the Federal offset ratio of 1:20, which is loosely based on the minimum effective offset ratio estimated from published research.

It is very important that assessment reporting clearly differentiates between references to no-net-loss outcomes *ipso facto*, outcomes according to State law, and outcomes according to Federal law.

Source of Offset funds

Any offsetting should be paid for in entirety by the beneficiaries of the development (landowners/developers). As much as 50% of the Growth Centers offsets are being reimbursed by the taxpayer, not through developer levies. This is effectively a public subsidy of the developers and is grossly inappropriate. The source of biodiversity offset funds must be publically acknowledged.

Offsetting reference group

Any offset scheme will require management through a reference group. It is likely the BWSEA offsets will be managed through the NSW Environment Trust and potentially the Sydney Growth Centres offset reference group. This group does not have a local environment representative (although a seat is held for a representative from a state group)

Any reference group (new or existing) for offset decisions must have representation from a local (Western Sydney) environmental group.

Biodiversity areas and public open space

Bushland managed for recreation (i.e. local parks and bike trails) retain very little biodiversity value, although they can be key community resources. Planning must clearly delineate up-front between areas dedicated for recreation and areas for conservation. Confusion and 'double-dipping' between these uses remains a key area of conflict in the Sydney Growth Centers.

While passive recreation in most natural areas should be encouraged, experience with the GCC has seen 'biodiversity' protection areas destroyed to provide key active recreational space.

Threatened woodland birds require large, quiet areas and are not found in the vicinity of picnic areas, cycleways or similar public open space uses.

Land set aside for biodiversity protection should not overlap areas to supply public open space. The Sydney Growth Centres have demonstrated the dire consequences of duplicating these requirements – e.g. at Shanes Park. Land should instead be managed for a single outcome only – either public open space or biodiversity conservation.

Biodiversity priorities – riparian areas vs. woodland

The previous *Biodiversity & Riparian Assessment* and some submissions (e.g. Penrith Council) recommended that riparian areas be used as biodiversity priorities and offsets. While this is convenient *vis a vis* development potential it does not protect that biodiversity at risk from the proposal.

The endangered biodiversity of the region and the vegetation to be most impacted by the proposal are both overwhelmingly terrestrial woodland not riparian forests. Since 1995 there has been little to no loss of riparian vegetation in the region while as much as 20% of the remaining critically endangered woodland has been lost.

Conservation priority must be given to Cumberland Plain Woodland as the most threatened community regionally and the community most impacted by this proposal. Prioritization of creeklines because of their limited development potential is not valid.

Biodiversity corridors

Any biodiversity corridors identified (existing or proposed) should differentiate between those for riparian and those for woodland biodiversity. The flora & fauna of riparian forest and terrestrial woodlands are completely different. Wildlife corridors for Cumberland Plain Woodland and woodland fauna (e.g. Jacky Winter, Speckled Warbler) are critical and need to themselves comprise terrestrial woodland or grassland. Riparian areas do not assist woodland species or ecological communities.

Key ecological values of BWSEA area

The region currently supports healthy populations of thousands of species of wildlife. Some notable species of concern include:

- The Speckled Warbler, a charismatic small woodland bird on the brink of extinction in the Cumberland Plain
- The Jacky Winter, one of Sydney's rarest birds
- The remarkable Fishing Bat, a vulnerable species found at dams and other open water in rural areas
- Populations of Eastern Grey Kangaroos which are vital to ecosystem health and cannot survive in creeklines or suburban contexts.

It is critical to note that none of these species adapt to matrix urbanization – they require large rural areas or very large remnants for survival.

At least four endangered or vulnerable wildflowers are found in the region:

- *Dillwynia tenuifolia*
- *Grevillea juniperina subsp. juniperina*
- *Persoonia nutans*

- *Pultenaea parviflora*

Additionally some dozens of rare and regionally vulnerable species are present.

Jacky Winter

The Jacky Winter was once one of the most common birds in Sydney. In 1903 AJ North described this species as '*without exception the most familiar bird in Sydney and the suburbs*'.



Above: Jacky Winter at Greendale

This is now one of the rarest birds in Sydney where it is largely restricted to the Cumberland Plain. Independent proposals have been made to list the species as vulnerable in NSW and the Cumberland Plain population as endangered; however due to the growing backlog of endangered species nominations neither nomination has been submitted.

The region is one of the best remaining sites for seeing Jacky Winter. While not formally listed, this is a highly significant species in danger of extinction in the Cumberland Plain. The DP&I and OEH should consider serious options for the protection of this species. It should be noted that this is an open woodland species and its habitat is not thickly treed to qualify for BioBanking purposes. The failure of BioBanking to provide for structurally open habitats in the Cumberland Plain is a serious problem both for assessment of impacts and for offsetting.

Migratory species and World Heritage impact

The Cumberland Plain wildlife does not exist in isolation. Many migratory and nomadic species currently rely on the rural land which makes up the BWSEA. It is fascinating to watch the arrival of long-distance migrants: in Winter the Tasmanian Silvereyes and Swift Parrot, and in summer the Pallid Cuckoo, White-throated nightjar, Sacred Kingfisher, Dollarbird, Rainbow Bee-eater, Fairy Martin, and Reed Warbler.

However for lack of space we will focus on those groups of greatest conservation concern: the migratory Robins, the Swift Parrot and the Regent Honeyeater.

There are five woodland robins native to the Cumberland Plain (plus the habitat generalist Eastern Yellow Robin). Three of these are migratory. The Scarlet Robin is present in the Plain from around April to August then returns to the Blue Mountains. The Flame Robin also visits the plain in Winter, although some animals remain in the mountains. And the Rose Robin remains in the Plain through the winter and migrates north in the summer.

It is not coincidental that both resident woodland robin species – the Red-capped Robin and Hooded Robin - are now virtually extinct in the Cumberland Plain. Clearly, the migratory robin populations are being supported by better bushland conservation in their Blue Mountains habitat. Conversely land clearing on the Cumberland Plain is now a key threat to their survival in the Blue Mountains.

The **Scarlet Robin** is listed as a vulnerable species. The scale of the proposal makes it impossible to avoid serious, permanent impacts on this species *within the Blue Mountains World Heritage Area*. Put simply, the clearing of many square kilometers of rural Cumberland Plain cannot be considered insignificant to a population migrating annually from the Blue Mountains. This impact is not acceptable and was not even considered in the *Biodiversity & Riparian Assessment*.

The **Regent Honeyeater** and **Swift Parrot** are two Tasmanian migrants, both iconic species already at extremely low numbers and falling. As a result these species are very rare visitors to the BWSEA area, however the region is key habitat. Both OEH and DP&I seem unable to comprehend that both species are now so rare that we cannot expect to detect them in a short ecological survey. This does not justify the conclusion that habitat is not vital. Both species are declining because of *landscape scale* woodland clearing, and unless this is stopped it is ridiculous to assume that the species declines can be stopped let alone reversed. The *status quo* is a rate of decline which will see both species extinct in the wild within my lifetime. Land clearing is no longer an option in the Cumberland Plain unless as a society we accept responsibility for the extinction of some of our most iconic wildlife.

Pultenaea parviflora

Considerable populations of this Cumberland Plain endemic are located within the BWSEA. Options for their conservation will need to be considered.



Above: *Pultenaea parviflora* in the BWSEA

Few if any of these populations are currently mapped. The survey efforts undertaken for the GCC are not adequate in this regard. The OEH survey effort guidelines incorporated in Appendix 1 should be undertaken at a minimum to ensure that populations of this species are suitably identified before planning the BWSEA.

Setting regional planning goals

It is incumbent on DP&I to identify the limits of growth in the Cumberland Plain. What is the desired end point? Are we to lose **all** wildlife and **all** rural lifestyle in the Cumberland Plain? We are well on track to realising that outcome within the next 30 years.

It is not enough to simply identify areas for growth. We also need to clearly identify the limits to growth.



Above: Planners are rarely connected with the region they impact or understand the scale of change realised. The speed and severity of change has decimated both the community and the environment of Western Sydney

Upcoming Federal endangered listing of Castlereagh Woodlands

The BWSEA will be impacted by the approaching Federal listing of the Endangered Ecological Community *Hinterland Sand Flat Forest and Woodland of the Sydney Basin Bioregion*.

Ecologically speaking these are two separate ecological communities each in danger of extinction. However the extreme rate of habitat loss nationally means that ecological communities are becoming threatened faster than they can be assessed and listed. The SEWPAC have amalgamated the ecological communities of *Castlereagh Scribbly Gum Woodland* and *Castlereagh Swamp Woodland* in response.

Given that both *Castlereagh Scribbly Gum Woodland* and *Castlereagh Swamp Woodland* are likely to be affected by the proposal and that the new listing is likely to come to force before the completion of the BWSEA, any legitimate assessment of the BWSEA must consider Castlereagh Scribbly Gum Woodland and Castlereagh Swamp Woodland on their *ipso facto* status as federally endangered ecological communities. Alternatively the BWSEA program including offset targets etc. will need to be revised and re-exhibited after listing of these vegetation communities.

Wildlife Rescue & associated costs

The BWSEA landscape is a living landscape. Even if the 'priority' areas are retained the proposal will remove thousands of hectares of Cumberland Plain grasslands which are habitat for tens of thousands of native animals. Most of this wildlife is not killed directly, but moves into adjoining areas to die of starvation or to be injured on road verges. It is not possible to catch or relocate this wildlife.

It is left to local wildlife carers to rescue this injured wildlife. The influx of road injury rescues which follow broadscale clearing ('*precinct peak*') is a serious problem for wildlife carers. Following the clearing of the original *Western Sydney Employment Area* wildlife care groups were inundated with injured animals and some considered suing for damages.

WIRES volunteers spend in excess of **one million hours** annually on animal rescue and care, the bulk of this effort occurring in the greater Sydney region. It is not appropriate that wildlife volunteers – who oppose DP&Is development aspirations – should be made to foot the enormous cost which results from these developments.

Key ecological remnants

Wonderland.

This region has been approved for development under the original Western Sydney Employment Area. There are some nominal areas to be retained – these are acknowledged and mapped in the Biodiversity and Riparian Assessment. As previously discussed, a 40 ha offset area shortfall remains outstanding for this precinct – it is imperative that this existing requirement is recognized through the BWSEA process.

The existing offset status of this site must be honored by the BWSEA assessment. Vegetation should be classified as 'existing offset areas' and counted separate to vegetation to be retained or removed.

Bakers Lane Erskine Park.

This is another significant area of Cumberland Plain Woodland which is not readily apparent from air photos and has not been surveyed.

Kemps Ck.

This flood-prone area is largely Castlereagh Ironbark and Scribbly Gum woodlands. There are three properties in the north of this area which have sparse canopy, are not or only partially mapped as native vegetation but retain excellent groundcover. It is critical that these areas are protected for their value, and not considered 'cleared' due to the lack of canopy.

Derived grasslands (from Castlereagh woodland) here support large populations of *Dillwynia tenuifolia*. This area complements and connects to the Kemps Creek Nature Reserve to the south (outside the BWSEA) – this connection must be maintained.

Twin Creeks.

This bushland is located within the new golf course, and some of this bushland has already been approved for development (for example the clearing right through the middle). The entire remnant constitutes an offset area for the Golf Course and associated residential development.

The existing offset status of this site must be honored by the BWSEA assessment. Vegetation should be classified as 'existing offset areas' and counted separate to vegetation to be retained or removed.

Recommendations

1. A satisfactory ecological assessment should be made and placed on public exhibition for comment *prior to any further planning* of the BWSEA. Such a report must provide:
 - a. Reliable estimates of the extent of the critically endangered Cumberland Plain Woodland *including*:
 - i. field inspection of all properties
 - ii. mapping of derived native grasslands
 - b. Reliable mapping of threatened flora
 - c. Reliable data on the distribution and approximate size of threatened fauna populations

The field survey should meet at a minimum the OEH guidelines for survey effort.

2. The formerly proposed 600 ha bushland conservation cap must be abolished. The extent of vegetation to be maintained should be determined *after* field survey on the basis of field data regarding the biodiversity to be impacted by the proposal.
3. Genuine consultation with local community environment groups should be undertaken. This should include early engagement and genuine discussions with key groups including at a minimum the Western Sydney Conservation Alliance and Cumberland Conservation Network.
4. Conservation priority must target the threatened species and most impacted ecosystems (woodland), not the undevelopable floodplain and creeks.
5. Any offsetting proposal must be valid and transparent. This will require:
 - a. Calculation of offsets for native grassland loss
 - b. Provisions to ensure that offset sites are (and remain) suitable for the threatened open woodland specialist species which will be impacted by the BWSEA
 - c. Provisions to ensure that offsets target the biodiversity lost. The BWSEA does not contain any hill country or Moist Shale Woodland. As a result offsets on the Razorback will not assist the species being impacted.

- d. Consideration of true offset costs – considering the need to offset on Shale Plains Woodland – i.e. flat, developable lands
 - e. The existing offset areas must be identified and respected in all assessment. These should be classified as ‘existing offset areas’ and not sneak into the figures of vegetation to be retained as has occurred with the GCC.
 - f. Recognition and resolution of the 40 ha offset deficit at the existing WSEA
 - g. Any offsetting should be paid for in entirety by the beneficiaries of the development (landowners/developers) and not by the taxpayer
 - h. Any reference group (new or existing) used to manage offset decisions must have representation from a local (Western Sydney) environmental group.
6. On receipt of valid ecological data, a clear and definable proposal should be presented for public comment identifying core areas for retention, offset ratios and requirements, and wildlife corridors. It is not sufficient to put a flexible methodology on public exhibition and plan by precincts. The community have a legitimate right to comment on a clear well-defined proposal, up-front, for the entire area.
7. Land set aside for biodiversity protection should not overlap areas to supply public open space. Land should be managed for a single outcome only – either public open space or biodiversity conservation.

Appendix 1 – NSW Minimum Survey Effort Guidelines

Extracted from *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (NSW Department of Environment 2004)

Target group	Type	Effort per stratification unit (i.e. per remnant)
Threatened flora	Foot meander searches	30 minutes per search. Number of searches: • 1 per unit <2 ha • 2 per unit 2 – 50 ha • 3 per unit 51-250 ha • 5 per unit 251-500 ha • 10 per unit 501-1000 ha plus additional for each extra 100 ha
Frogs • Giant Burrowing Frog is likely to occur	Night habitat search	30 minutes on two separate nights per unit AND two hours per 200 m of surveyed water body edge
	Nocturnal call playback	One playback on each of two separate nights per unit
Reptiles No threatened species likely to occur	N/A	N/A
Birds • Speckled Warbler • threatened raptors • threatened robins • Swift Parrot • Regent Honeyeater.	Diurnal terrestrial birds	2 ha x 20 minute counts as per NSW bird atlas – to include counts of individuals for each species Number of searches: • 1 per unit <2 ha • 2 per unit 2 – 50 ha • 3 per unit 51-250 ha • 5 per unit 251-500 ha • 10 per unit 501-1000 ha plus additional for each extra 100 ha Must include open habitats and not be restricted to mapped 'remnants' Must be conducted in August to September to ensure valid assessment of region's

		significance for swift parrot and regent honeyeater
	Wetland census	A one-hour census at dawn or dusk, for each identified wetland
	Large forest owls	Sites at intervals of 800 meters – 1km within remnants As Masked Owl are likely to be present each site must have the playback session repeated a minimum 8 visits
Mammals	Terrestrial mammals No threatened terrestrial mammals are likely. Most otherwise common species of small ground mammal are extinct in the Cumberland Plain. Any terrestrial mammals present are of high conservation value.	Survey for small ground mammals by Elliott trapping is strongly recommended, however this cannot be legally enforced as a survey requirement.
	Microbats	Two sound activated Ultrasonic call recording devices utilised for the entire night (a minimum of four hours), starting at dusk for two nights Must be conducted during October to March
Invertebrates	Cumberland Plain Land Snail	No quantitative survey guidelines. Given the intensity of survey necessary to detect this species it may be practical to assume presence in development areas. It is not valid to assume this species presence at offset sites.