P & J SMITH ECOLOGICAL CONSULTANTS

P.J. SMITH B.Sc.Hons, Ph.D.
J.E. SMITH B.Sc.Agr.Hons, Dip.Ed., Ph.D.

44 Hawkins Parade, Blaxland NSW 2774
Phone 0484 784 820 Peter
0487 988 047 Judy
Email: smitheco@ozemail.com.au

Submission in regard to

Bowdens Silver Project

State Significant Development No. 5765

Dr Judy Smith and Dr Peter Smith

P & J Smith Ecological Consultants

1 July 2020

Introduction

We thank you for the opportunity to comment on the proposed Bowdens Silver Project at Lue.

We object to the proposed Bowdens Silver Project - the project is not in the Public Interest and does not meet the principles of Ecologically Sustainable Development. Consideration of the *EPBC Act Policy Statement 1.1 Significant Impact Guidelines,* which provide overarching guidance on determining whether an action is likely to have a significant impact on matters protected under national environment law — the *Environment Protection and Biodiversity Conservation Act 1999* - indicate that the proposed activity, despite the proposed mitigation and off-setting measures, will have a significant and unacceptable impact on such matters.

We believe that the risks and likely impacts associated with the project, including in regard to loss of terrestrial and aquatic biodiversity; human health; pollution and degradation of air and water quality including with lead and cyanide; noise; alteration of existing surface water flows; baseflows of Lawsons Creek and Hawkins Creek; artificial movement of water between two different catchments (the Hunter River Catchment that flows to the east and the Cudgegong River

catchment that flows to the west); and increased heavy vehicle traffic are unacceptable. The planned remediation, stabilization and regeneration of the project site on completion of the proposed project are inadequate.

In this submission, we wish to state our particular concern is in regard to the likely impacts of the proposal on terrestrial biodiversity. We are terrestrial ecological consultants with expertise in both flora and fauna. We have worked continuously as principals of our ecological consulting firm *P and J Smith Ecological Consultants* since 1985. Dr Judy Smith holds a PhD in Zoology and Ecosystem Management, Dr Peter Smith holds a PhD in Botany. Our ecological consulting firm is based in the Blue Mountains. Since 1985 we have worked widely across Australia but particularly in the Greater Sydney and Blue Mountains areas. We are familiar with the flora and fauna of the Lue area and the route of the proposed water pipeline between Lue and Ulan/Moorlarben. We are also very familiar with the flora and fauna of important nearby internationally recognized biodiversity conservation areas including the Greater Blue Mountains World Heritage Area/Key Biodiversity Area and the Capertee Valley and Mudgee-Wollar Key Biodiversity Areas (KBAs). Two of our grandchildren are past pupils of Lue Public School.

Location of proposed project

The proposed project is only 2 km north-east of Lue and 26 km east of Mudgee. It is in the catchment of Lawsons Creek which flows to the Cudgegong River and thence to Lake Burrendong.

The proposed project is located approximately 20 km from the Greater Blue Mountains World Heritage Area and Key Biodiversity Area (Wollemi National Park) to the east, 30 km from the Capertee Valley Key Biodiversity Area to the south, and 20 km from the Mudgee-Wollar Key Biodiversity Area to the north. Existing habitat within the area of the proposed project plays an important role in facilitating the movement of fauna between the above important areas for biodiversity. The recent 2019-20 bushfires were unprecedented in terms of their scale and severity. These fires burnt around 75% of the Greater Blue Mountains World Heritage Area and an estimated 25% of all Koala habitat in south-eastern Australia. All areas of unburnt habitat, particularly in areas such as Lue that are in close proximity to major biodiversity areas, are now important refuges which are needed if we are to prevent the local extinctions of many plants and animals.

Existing terrestrial biodiversity values of the proposed project site

EnviroKey Pty Ltd (2020), in their ecological assessment for the proposed project prepared for Bowdens Silver Pty Ltd, found that the proposed mine site (which includes the mine area and water pipeline corridor) supports a very rich and significant terrestrial flora and fauna. EnviroKey found that the proposed site supports:

- 11 native vegetation types
- One critically endangered ecological community. Three of the eleven native vegetation types identified by EnviroKey in their study area are forms of 'White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands' ('Box-Gum Woodland'), which is a Critically Endangered Ecological Community listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and an Endangered Ecological Community listed under the NSW *Biodiversity Conservation Act 2016.* Worldwide, less than 5% of this critically endangered ecological community now

remains in good condition. The community generally occurs as small fragmented remnants. EnviroKey (2020) notes that a portion of the Box-Gum Woodland comprises "only" derived grassland and not trees and shrubs, which have already been cleared by past agricultural activities. However, examples of this critically endangered ecological community from which trees have been removed are also considered vitally important, particularly as most of the plant species diversity of this community occurs in the ground layer vegetation. Examples of this ecological community, both with or without a tree layer, are considered to be critically endangered and as such are afforded legal protection. The three native vegetation types within the study area that equate to the threatened Box-Gum Woodland are:

  - **CW 112** Blakely's Red Gum – Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion (273.15 ha in study area). This is a highly cleared vegetation type with an estimated 95% of this community already cleared in the Central West.
  - **CW 111** Rough-barked Apple – Red Gum – Yellow Box Woodland (Medium/Good_Medium) on Alluvial Clay to Loam Soils on Valley Flats in the Northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion (336.30 ha in study area) and **CW 111** Rough-barked Apple – Red Gum – Yellow Box Woodland on Alluvial Clay to Loam Soils on Valley Flats in the Northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion (Moderate/Good_Poor) (201.71 ha in study area). It is estimated that 67 % of this community has already been cleared in the Central West
  - **CW 216** White Box Grassy Woodland in the Upper Slopes sub-region of the NSW South Western Slopes Bioregion (Moderate/Good_Medium) (9.18 ha in study area). This is a highly cleared vegetation type with an estimated 94% of this community already cleared in the Central West.

- 14 threatened fauna species which are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and/or the NSW *Biodiversity Conservation Act 2016,* including the Koala, Barking Owl, Dusky Woodswallow, Hooded Robin, Diamond Firetail, Varied Sittella, Scarlet Robin, Speckled Warbler, Brown Treecreeper, Grey-crowned Babbler, Eastern Cave Bat, Greater Broad-nosed Bat, Eastern Bentwing Bat and Large-eared Pied Bat. These threatened species are all part of a suite of woodland species which are now suffering rapid and widespread declines.
- Core Koala habitat. EnviroKey (2020) recorded a number of tree species, including Rough-barked Apple *Angophora floribunda*, White Box *Eucalyptus albens*, Blakely's Red Gum *E. blakelyi*, Ribbon Gum *E. viminalis*, and Scribbly Gum *E. rossii* within the study area, all of which are listed as Koala feed tree species under Schedule 2 of SEPP (Koala Habitat Protection) 2019. Given the presence of Koala feed tree species and recent records within and adjacent to the proposed mine and water pipeline, it is considered likely that the Study Area contains Core Koala Habitat as defined by SEPP (Koala Habitat Protection) 2019. A year-long State parliamentary investigation report that has just been tabled has predicted that the Koala will become extinct in NSW before 2050 unless there is urgent government intervention to prevent habitat loss.
- Additional threatened fauna species, including the Squirrel Glider and Spotted-tailed Quoll, occur in the vicinity and are predicted to occur in the study area.
- Two threatened flora species listed under the NSW *Biodiversity Conservation Act 2016* (Ausfeld's Wattle *Acacia ausfeldii* and Silky Swainson-pea *Swainsona sericea*). A large number (239) of Ausfeld's Wattle plants were recorded at eight locations along the proposed water pipeline in the study area. It is noteworthy that Ausfeld's Wattle is identified as a 'Red Flag' species in the NSW BioBanking Credit Calculator, i.e. it is a

species that is considered unable to withstand any further loss if it is to survive in the future.

- Suitable, likely important, habitat for the Regent Honeyeater. The Regent Honeyeater is critically endangered at both state and national level, is currently declining despite a tree planting effort in the district to restore habitat for the species, and sits on the brink of extinction in the wild. The Regent Honeyeater was not recorded on site by EnviroKey during their surveys. This is not surprising given the relatively short period of their fauna surveys, the extreme rarity of the Regent Honeyeater (it is estimated that only 350-400 birds survive in the wild), and because the Regent Honeyeater is not sedentary but rather is known to move widely and to be reliant on widespread patches of habitat for its survival. The proposed mine and water pipeline site is situated between two known key breeding areas for the Regent Honeyeater: the Mudgee-Wollar area and the Capertee Valley area. EnviroKey (2020) (page 114) conclude that it is reasonable to expect that the study area "could contain important habitat for the species [Regent Honeyeater]".
- Two migratory species listed in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Rainbow Bee-eater and White-throated Needletail).
- 267 native flora species
- 122 native species of birds
- 16 native species of mammals
- 18 native species of reptiles
- Six native species of frogs

The impacts of the proposed project on biodiversity values

EnviroKey (2020) state that the proposed project would result in:

- A total disturbance footprint of approximately 495.54 ha.
- Clearing of 381.71 ha of native vegetation. Clearing of vegetation would be undertaken within 18 months of project commencement.
- The removal of 182.27 hectares of NSW *Biodiversity Conservation Act 2016* listed Box-Gum Woodland (including 21.80 ha of CW 112, 94.09 ha of CW 111 and 66.38 ha of CW 216), of which 147.82 ha meets the legal classification of the Commonwealth *Environment Protection and Biodiversity and Conservation Act 1999* critically endangered 'Box-Gum Woodland'.
- Loss of integrity within the 519.2 ha of Commonwealth-listed critically endangered Box-Gum Woodland that would remain within the Study Area on completion of the project. This remaining Box-Gum Woodland would be fragmented by the proposed action. Such fragmentation of an ecological community invariably leads to long term degradation of the community due to factors such as increased weed and feral animal invasion, changed microclimate and increased predation at increased edges, increased erosion and changes in the local hydrology. The Noisy Miner is also likely to increase in numbers with increased fragmentation. This is a native species but one that is recognised as a Key Threatening Process under the NSW legislation because it has major impacts on other bird species when it becomes too abundant. EnviroKey (2020) note that the proposed action could (though they deem it "unlikely") also cause mobilisation of chemicals or pollutants into the remaining Box-Gum Woodland that could destroy or inhibit growth. This is a very substantial area of critically endangered ecological community that will suffer long term degradation.
- The removal of 139.59 ha of known core Koala habitat.

- The removal of 182.27 ha of important Regent Honeyeater habitat including Box-Gum Woodland. It is unclear how many remnant Box-Gum Woodland trees as occur along the proposed water pipeline outside of mapped Box-Gum Woodland remnants would also be cleared. Loss of their woodland habitat and mature remnant trees (as occur along road sides) is the major threat to the Regent Honeyeater as well as to the other threatened woodland birds that inhabit the study area. Due to past clearing for agriculture, and more recent clearing for other developments such as mining, the Box-Gum Woodlands, once extensively distributed across inland eastern Australia, have now largely been cleared, making them one of the most threatened ecosystems in Australia. Thomas *et al.* (2000) estimate that in south-eastern NSW the extent of Box Gum Woodland has been reduced to around 5% of its pre-1750 distribution. Within the Central West of NSW, between 67% and 95% of the forms of Box-Gum Woodland present in the study area and proposed for clearing, have already been cleared. Pre 2019-20 bushfire estimates indicate that only 350-400 mature Regent Honeyeaters remain in the wild. This number may well now be lower and the critically endangered species is considered to be on the brink of extinction
- Impacts to at least 13 threatened species that are listed in NSW as 'ecosystem credit' species.
- Impacts to at least six threatened species that are listed in NSW as 'species credit' species.
- Loss of Ausfield's Wattle plants. Ausfeld's Wattle is identified as a 'Red Flag' in the NSW BioBanking Credit Calculator i.e. it is a species that is considered unable to withstand any further loss if it is to survive in the future. The species is known only from the Mudgee-Ulan-Gulgong area and many populations are confined to roadside vegetation remnants and are small in size (OEH 2019). It is unclear how many Ausfeld Wattle plants would be impacted.
- The project will take water from Ulan Mine which should be returned to the Goulburn River in the Hunter catchment, not redirected as proposed to the Cudgegong River in the Macquarie catchment on the other side of the Great Dividing Range. The May 2018 Commonwealth *Bioregional Assessment for the Northern Sydney Basin-Hunter Subregion* has raised concerns in regard to cumulative risks of potential hydrological change in the Hunter subregion including to ground water dependent ecosystems in that area. The Hunter subregion includes the Ulan Mine site.
- Accumulation of cyanide-bearing waste in the Tailings Storage Facility posing a risk for any fauna which comes into contact with such waste, either directly in the Facility or in contaminated water that has seeped from the Facility.

Proposed site rehabilitation

If approved, proposed clearing of native vegetation would be undertaken within 18 months of project approval. According to EnviroKey (2020), the nature of the proposed project dictates that the major disturbed areas associated with the main open cut pit, processing area and tailings storage facility would remain active throughout the mine life and, as a consequence, the opportunity to undertake progressive rehabilitation of these components would be minimal. It is thus proposed that most of the site rehabilitation would be undertaken within a limited 6.5 year period following cessation of mining. Within this 6.5 year period Bowdens Silver proposes to ensure that the following rehabilitation objectives are met:

• the rehabilitated landform is safe, stable and sustainable particularly with regards to soils and hydrology;

• components of the final landform, including diversion channels, are re-instated or stabilised with native vegetation to specifically provide fauna habitat and corridors;

• the surrounding environment is not polluted by any mine-related activity during the mine life or following mine closure;

• the contaminated areas remaining on site, namely the Waste Rock Emplacement and Tailings Storage Facility are appropriately covered and vegetated to ensure the materials in both component areas do not contribute to any off-site pollution;

• the rehabilitated final landform requires low levels of maintenance; [it is not stated who will provide maintenance in perpetuity]

• the approach to rehabilitation is continually reviewed based on site specific knowledge, research and monitoring; and

• the mining lease over the rehabilitated landforms can be progressively relinquished and the security returned progressively within a reasonable timeframe after the successful completion of rehabilitation activities.

We believe that there is an unacceptable risk that these objectives will not be achieved. The project will involve removal of mature vegetation and fauna habitats that have taken hundreds of years to reach maturity. Such vegetation cannot be removed from a site for a 16.5 year period and then re-established and secured within a 6.5 year period, particularly on ground that has been extensively impacted and modified. Initial proposed rehabilitation will involve sowing of disturbed areas with grass seed. The period taken to move from initial establishment of grass (it is not stipulated if grasses native to the locality will be used) to the recovery of mature hollow-bearing trees (critical habitat for many fauna species) will far surpass a human lifespan.

Adequacy of proposed mitigation measures and biodiversity offset strategy

EnviroKey (2020) state that “the impact assessment has conservatively been undertaken without formally considering that approximately 344 ha of the Mine Site would be revegetated to native woodland and grasslands using species consistent with the existing vegetation communities. In the long-term, these rehabilitation areas would further reduce impacts to biodiversity.” EnviroKey do not elaborate as to what they mean by “long-term”. It will take hundreds of years to re-establish vegetation communities as they now occur on the mining site and along the water pipeline. We do not believe that species and communities, such as the critically endangered Regent Honeyeater and threatened Koala, can wait so long.

Of particular concern is the critically endangered Box-Gum Woodland (Regent Honeyeater habitat) that will be removed from the site and that is very poorly represented in conservation reserves (it occurs predominantly on fertile soils outside reserves, the reserves themselves being generally located on poorer soils). Despite the “personal observations” (page 308) of EnviroKey (2020), this is one of the most threatened and most studied ecological communities in Australia. The relatively large remnant at Lue is highly significant. Research into the restoration and rehabilitation of the critically endangered Box-Gum Woodland (as found at the Lue site) is being undertaken by the Fenner School of Environment and Society, Australian National University, and led by Dr Damien Michael, Senior Research Officer. This research is being undertaken because this ecological community has already declined to a critical level and “Currently, we lack effective methods for returning threatened plants to areas of box-gum woodland from which they have been lost, or including them in revegetation and restoration projects aimed at bringing back this

habitat type. Techniques are particularly lacking for ground cover plants like forbs (flowering herbs)."

Proposed offsets entail seeking credit to retain some existing native vegetation in the proposed project area, using existing off-site native vegetation to secure the establishment of Biodiversity Stewardship Agreements and the potential purchase of credits from third parties who have established Stewardship Agreements. If these schemes do not fully eventuate then payment would be made into the Biodiversity Conservation Trust. There is no detail as to how such offsets will be managed or secured in perpetuity i.e. beyond the life of the current generation.

There appears to be no consideration given to the fact that the retained native vegetation within and surrounding the project site (which is to be used as an "off-set") will have been fragmented and thus degraded by edge effects during the 16.5 year life span of the mining operation. Initial clearing operations will result in injury and mortality of fauna. Most fauna cannot simply move to adjacent habitats and re-establish territories – such habitat, if it exists, is already occupied. It is likely that some species will become extinct in the reduced areas of habitat remaining on site. Retained on-site vegetation will be fragmented, subject to noise over the period of mine operation, and subject to on-going increased weed invasion and feral animal invasion and altered hydrological conditions.

The proposed off-setting, whether on-site or off-site, relies on changing the legal status of existing stands of native vegetation. Given the high conservation value and current restrictions curtailing the loss or degradation of this critically endangered ecological community, it is highly unlikely that such areas would ever have been subject to future intense agricultural activity (as is given as justification for off-setting). Indeed, many local individuals and community groups are now working hard to restore such habitats and receiving government and private sponsorship to support their efforts. The end result will be a net loss of critically endangered Box-Gum Woodland and Regent Honeyeater and Koala foraging and breeding habitat.

Conclusion

We believe that the likely loss of biodiversity that would result from the proposed Lue Silver mine project is unacceptable. It will lead to habitat loss, habitat fragmentation, loss of habitat connectivity and wildlife corridors, and degradation of remaining habitat.

Despite the proposed mitigation measures and off-setting, we believe that the project will have a significant negative impact on the critically endangered Box-Gum Woodlands and Regent Honeyeater, as well as other threatened woodland birds and other species including the Koala. The proposed project (including off-set and mitigation measures) will lead to a net loss of Box-Gum Woodland. It is clearly contrary to the first objective of the *National Recovery Plan for Box Gum Woodland (White Box – Yellow Box – Blakely's Red Gum and Derived Native Grassland),* prepared in 2010 by the NSW Department of Environment, Climate Change and Water on behalf of the Australian Government, which is to

> *Achieve no net loss in extent and condition of the ecological community throughout its range*.

Evaluation of a development application by a consent authority must consider the Public Interest. We do not believe that it is in the Public Interest to risk the continued existence of critically endangered vegetation communities, such as the Box-Gum Woodland, nor to place species such as the critically endangered Regent Honeyeater and threatened Koala at an increased risk of extinction. It is not in the Public Interest to undertake activities, such as in this project, which will undermine the efforts of many individuals and groups who have been working to ensure the continued existence of local biodiversity such as will be lost due to this project.

In order to be approved, the proposed project must be in keeping with the principles of Ecologically Sustainable Development. Ecologically Sustainable Development can be defined as "development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends".

The principles of Ecologically Sustainable Development include:

- Conservation of biological diversity and ecological integrity
- Inter-generational and intra-generation equity
- Sustainable use
- Precautionary principle

We believe that the proposed project is not in keeping with these principles. Despite proposed mitigation and off-setting measures, there will be an irreversible loss of biological diversity and ecological integrity. While some members of the current generation will benefit financially from the project, other members risk suffering significant detrimental impacts due to the project. There is no equity for future generations who will be left with diminished biodiversity as well as a possibly contaminated and very large Tailings Storage Facility (covering approximately 117 ha), open cut mine void (covering close to 50 ha) and waste rock emplacement (covering approximately 77 ha) to manage in perpetuity. The proposed Tailings Storage Facility that is to be left to future generations is only marginally smaller than Lake Wallace (125 ha) at Wallerawang.

Bowdens Silver state that they would commission a "Plan" that documents actions and procedures that would be followed in the "highly unlikely" event that a partial or full failure of the Tailings Storage Facility occurs. Bowdens Silver do not state who will undertake, in perpetuity, the required safety and regular surveillance and monitoring intended to avoid partial or full failure of the Tailings Storage Facility. To create a situation in which there is any possibility (even if "highly unlikely") of partial or full failure of the Tailings Storage Facility, either during the life of the project or under the watch of future generations, is not in keeping with the Precautionary Principle nor the principle of Inter-generational Equity.

The Australian Government's *EPBC Act Policy Statement 1.1 Significant Impact Guidelines* provide overarching guidance on determining whether an action is likely to have a significant impact on a matter protected under national environment law — the *Environment Protection and Biodiversity Conservation Act 1999*.

According to these *Guidelines*, an action is likely to have a significant impact on a critically endangered or endangered ecological community (such as the Box-Gum Woodland that is to be removed from the study area) if there is a real chance or possibility that it will:

• reduce the extent of an ecological community

• fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

• adversely affect habitat critical to the survival of an ecological community

• modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns

• cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

• cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

• interfere with the recovery of an ecological community.

Under these same *Guidelines*, an action is likely to have a significant impact on a critically endangered or endangered species (such as the Regent Honeyeater for which the study area provides likely important habitat) if there is a real chance or possibility that it will:

• lead to a long-term decrease in the size of a population

• reduce the area of occupancy of the species

• fragment an existing population into two or more populations

• adversely affect habitat critical to the survival of a species

• disrupt the breeding cycle of a population

• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

• introduce disease that may cause the species to decline, or

• interfere with the recovery of the species.

Clearly, the proposed project is contrary to these *Guidelines*. The EnviroKey (2020) Biodiversity Assessment Report states (page 308) that, in regard to the *Significant Impact Guidelines* and the critically endangered Box-Gum Woodland, that yes, the proposed action 'will interfere with the recovery of this ecological community'. EnviroKey go on to infer that this is not of consequence because:

> "*the CEEC* [Box-Gum Woodland, critically endangered ecological community] *is reasonably well represented in the wider locality. This comment is based on the basis of personal observations rather than a reliance on broad-scale regional mapping by OEH* [Office of Environment and Heritage], *given that in our experience, this is largely inaccurate. Therefore, the extent of CEEC is the wider locality cannot be accurately quantified.*"

Such a statement is unsubstantiated speculation that has no place in a scientific assessment. It is beyond comprehension that any critically endangered ecological community, including the critically endangered Box-Gum Woodland, one of the rarest ecological communities in Australia, is reasonably well represented anywhere.

We recommend that the proposed Bowdens Silver Mine not be approved.

References

Department of Environment, Climate Change and Water NSW. 2010. *National Recovery Plan for White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Department of Environment, Climate Change and Water, Sydney.

EnviroKey Pty Ltd. 2020. Part 9a Biodiversity Assessment Report Sate Significant Development No. 5765. Prepared on behalf of Bowdens Silver Pty Ltd. EnviroKey Pty Ltd, Tathra.

Herron, N.F. *et al.* 2018. *Impact and risk analysis for the Hunter subregion.* Product 3-4 for the Hunter subregion from the Northern Sydney Basin Bioregional Assessment. Department of the Environment and Energy, Bureau of Meteorology, CSIRO and Geoscience Australia, Australia.

OEH. 2019. BioNET: The website for the Atlas of NSW Wildlife: A whole-of-government system for flora and fauna sightings information [Online].

Thomas, V., Gellie, N. & Harrison, T. (2000) *Forest ecosystem classification and mapping for the Southern CRA region, Volume II Appendices.* NSW National Parks & Wildlife Service, Southern Directorate. A report undertaken for the NSW CRA/RFA Steering Committee.