

## SCHEDULE FOUR

### Report under the NV Act 2003 in relation to the use of more appropriate local data (section 2.4.3 of the Environmental Outcomes Assessment Methodology)

**Accreditation number:** 30628

**PVP/DA reference number:** CMA8609

It is recommended that more appropriate local data be substituted for the data in the PVP Developer in relation to:

- whether threatened animal species are likely to occur on the land in that vegetation type or habitat feature in the sub region.
- whether riparian vegetation can be used as an offset for clearing of scattered Rosewood, Wilga, Belah, Grey Box and Poplar Box trees in a non-riparian location.

#### **Description of the proposed clearing:**

The property vegetation plan involves the clearing of 630 scattered paddock trees from several existing cultivation fields approximately 11 kilometres east of the town of Collie. The subject property is located within the Castlereagh-Barwon sub-region of the Central West Catchment Management Authority area.

The scattered paddock trees which the landholder would like to remove are a mixture of Wilga (*Geijera parviflora*), Belah (*Casuarina cristata*), Rosewood (*Alectryon oleifolius*), Grey Box (*Eucalyptus macrocarpa*) and Poplar Box (*Eucalyptus populnea*). Of the trees to be removed, slightly more than 50% are Rosewood. A sample of 63 trees to be removed showed 54% were Rosewood, 21% Belah, 18% Wilga and 8% Grey Box. The trees identified for removal were noted as being of low vegetation condition during a site inspection by CWCMA officers.

Measurements taken by CMA officers of a selection of trees proposed for removal showed a range in the diameter of Wilga from 20 – 34cm with no trees having hollows. Belah trees measured were all large, with a range in diameter of 69 – 98cm, with 75% containing hollows. Rosewood trees recorded had diameters ranging from 37 – 47cm with 25% having small hollows (<5cm diameter). Measured Grey Box recorded a range in diameter from 47 – 70cm with nearly all trees having a small hollow but little to no med-large hollows (> 5cm diameter). Only one Poplar Box tree was measured. This tree had a diameter at breast height of 69cm and contained three small hollows.

The vegetation type covering the clearing area was classed as 'Poplar Box grassy/shrubby woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) (Benson 244)'. One of the offset areas is the same vegetation type and is in the waterway of Boothaguy Creek. The size of this area is 80.77ha, however the waterway does not contain many adult trees, and is mostly grass land. The other offset is adjacent to the Marthaguy Creek and is a vegetation type of 'Dirty Gum tall woodland of alluvial sandy lenses (sand monkeys) mainly of the Darling Riverine Plain Bioregion (Benson 206)'.

Question 1

Can the removal of the scattered paddock trees be mitigated from the use of these offsets and the planting of trees so the foraging and habitat of the Little Pied Bat and Yellow-bellied Sheath-tail-bat will not be affected?

Question 2

Are there any species of trees that you suggest can be planted in the waterway to help offset the effects of clearing?

**Details of the data proposed to be substituted:**

Question 1 –

a) The Threatened Species Tool of the PVP Developer indicates that offsets required for the Little Pied Bat and the Yellow-bellied Sheath-tail Bat be vegetation of the same species as that proposed to be cleared (see table below).

	<b>Ability to sustain loss in paddock trees(See Operational Manual for offset &gt; 75% of benchmark)</b>	<b>Special sustain loss and offset requirements</b>
Little Pied Bat ( <i>Chalinolobus picatus</i> )	Yes; offset overstorey cover must be <75% of upper benchmark, have minimum 5X the number cleared, be similar dbh class and same spp. Management of offset must include sufficient replanting of overstorey spp. to replace mature canopy cover to within benchmark range.	
Yellow-bellied Sheath-tail Bat ( <i>Saccolaimus flaviventris</i> )	Yes; offset overstorey cover must be <75% of upper benchmark, have minimum 5X the number cleared, be similar dbh class and same spp. Management of offset must include sufficient replanting of overstorey spp. to replace mature canopy cover to within benchmark range.	

It is proposed in relation to the use of more appropriate local data (section 2.4.3 of the Environmental Outcomes Assessment Methodology) that the requirement for the same vegetation species to be offsets as that being removed should be modified in the case of the Little Pied Bat and the Yellow-bellied Sheath-tail Bat. The reasoning is that in this case the proposed offset areas (which will also include planted trees) should be considered to be higher quality foraging habitat than the scattered trees proposed to be removed. Also, it is considered that mature Rosewood trees, which make up over half of the trees to be removed, do not provide tree hollows of suitable size for the roosting of the Yellow-bellied Sheath-tail Bat and that the Little Pied Bat is highly unlikely to utilise hollows in scattered trees in a cropping paddock compared to areas of intact remnant vegetation nearby.

**Reasons for recommending the proposed substitution:**

1. Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris*)

- A search of the BioNET and NSW Wildlife Atlas databases on the 25/11/2009 reveal a total of 5 records of the species within the Gilgandra local government area (where the subject property is located). No records are near the subject property at Collie. Other records of this species occur all around the subject property outside of the local area, thus this species does have the potential to occur in the proposed development area.
- Ayers *et al.* (1996) stated the species occurs in most wooded habitats, and during the day roosts in large tree hollows. The bat feeds by foraging for flying insects above the tree canopy. The proposed development site is not a wooded habitat preferred by the species, however foraging over the scattered paddock trees can still take place. One of the proposed offset areas adjacent to Marthaguy Creek is at woodland density and thus would be a more preferred foraging habitat by this species over the scattered paddock trees.
- NPWS (2002) in an extensive survey of the Darling Riverine Plains Bioregion (of which the subject property is a part), recorded the species at a wide range of habitat types ranging from *Eucalyptus* and *Casuarina cristata* (Belah) woodlands to open *Acacia pendula* (Myall) woodland and low chenopod / grass plains. It was noted that several sites at which this species was detected were in isolated woodland fragments or in cleared land near woodland fragments. It was suggested the species had at least some ability to persist in environments with reduced roost availability. No records were made from scattered paddock tree habitats. The proposed offset areas would therefore represent more preferred foraging habitat than the scattered trees in a cleared paddock.
- A biodiversity survey of the Brigalow Belt South Bioregion (east of the subject property) recorded the species from numerous eucalypt vegetation communities plus Bloodwood, Smooth-barked Apple and Brigalow (RACD 2002). All sites were woodland / forest patches and not scattered paddock trees. Therefore, the proposed offset areas would represent more preferred foraging habitat than the scattered trees in a cleared paddock.
- Shelly (2006) reported on the results of 40 week-long fauna surveys conducted over several years throughout the Central West Catchment. The Yellow-bellied Sheath-tail Bat was not detected from any sites within cultivation or grassland paddocks (with or without scattered trees). The vegetation types with the highest detections per site (an indication of foraging habitat preferences) were Rough-barked Angophora / Blakely's Red Gum open woodland, Lignum shrubland and Inland Red Box / White Cypress Pine woodland.

Eucalypt woodland areas provided the majority of known species detections and would seem to be preferred habitats compared to more open vegetation types.

- Rhodes and Hall (1997) reported on the finding of a colony of 29 bats found in a dead eucalypt tree in Queensland. This stag tree was estimated to be 20m tall and was located in a cleared paddock. The stag was at least 25m from any other trees. The colony was the largest recorded at that time. It was suggested that the colony required a large tree hollow to hold so many bats as the species is one of the largest of the micro-bats. Thus, large hollow-bearing scattered paddock trees, dead or alive, can be utilised by this species. The proposed development area consists mainly of scattered mature trees of Western Rosewood. Data obtained by PVP officers show that a representative sample of these trees contained very few hollows, with the only hollows noted being of small size. Medium – large hollows were recorded more frequently in large Belah trees which form a small proportion of the trees to be removed.
- Richards (2000) recommended two important management priorities for the Yellow-bellied Sheath-tail Bat as being the retention of large tracts of woodland and forest foraging habitat, and the conservation of tree hollow roosts. The proposed development area is scattered to isolated paddock trees and not tracts of woodland, with the majority of trees unlikely to provide suitable hollows for roosting. The offset areas, however, are a woodland area and an ephemeral waterway that will be enhanced by tree planting. Both sites are considered preferred foraging habitat for this species over scattered trees within cultivation paddocks.
- The Yellow-bellied Sheath-tail Bat requires large tree hollows for nesting and roosting (Ayers *et al.* 1996). The trees proposed for removal in this application are noted as being mostly Rosewood, and as such, are unlikely to contain large tree hollows suitable for roosting should the species occur in the local district.

A survey of tree hollow presence according to tree diameter and height was conducted by Shelly (2005) for most of the tree species in the Central West Catchment of NSW. In the case of Rosewood it was found that small hollows (<5cm entrance diameter) were consistently found in trees above 30cm dbh and medium hollows (5-15cm) consistently occur in trees above 38cm dbh. No large tree hollows (>15cm) were recorded for Rosewood at any tree diameter or height. For Wilga trees, only small diameter hollows were recorded in trees over 28 cm dbh. Belah trees consistently recorded small hollows in trees above 44 cm dbh, medium sized hollows in trees over 53 cm and large hollows in trees above 88 cm dbh. Of the eucalypt species identified to be cleared, Grey Box consistently gave small and medium hollows when above 56 cm dbh and large hollows over 82 cm dbh. Poplar Box was found to consistently have small hollows when above 30 cm dbh, medium hollows above 41 cm dbh and large hollows over 54 cm dbh.

Therefore, it can be considered that limited roosting habitat for the species is present in the majority of trees proposed to be cleared (Rosewood, Wilga), however the larger Belah and eucalypt species do contain hollows but mostly of small size.

## 2. Little Pied Bat (*Chalinolobus picatus*)

- A search of the BioNET and NSW Wildlife Atlas databases on the 25/11/2009 reveal no records of the species within the Gilgandra local government area where the subject property is located. Other records of this species occur in all directions around of the subject property outside of the LGA, thus this species does have the potential to occur in the proposed development area. It is assumed that the lack of records in the local region is a result of no surveys being undertaken in the area rather than the species not actually being present.
- Ayers *et al.* (1996) stated the Little Pied Bat is known from Brigalow, riparian and Bimble (Poplar) Box woodlands as well as mallee areas. The bat can roost solitarily or in small breeding colonies. Therefore, breeding colonies would require larger tree hollows than that

for a single bat. Scattered Rosewood trees in a cleared paddock are unlikely to contain hollows available for breeding colonies of this species. Neither are the planted trees in the proposed offset along Boothaguy Creek until they reach mature age.

- Extensive surveys within the Brigalow Belt South Bioregion have recorded the species from the Pilliga province (that closest to the subject property location). Habitats where the species was recorded were mainly ironbark, Brigalow (*Acacia harpophylla*), White Box (*Eucalyptus albens*), Pilliga Box (*E. pilligaensis*) and Grey Box (*E. microcarpa*) (RACD 2002).
- Extensive surveys within the Darling Riverine Plains Bioregion found the Little Pied Bat in a wide range of habitat types (NPWS 2002). These were all woodlands with the exception of open shrublands of Myall. The surveys indicated a marked preference for Belah habitat types, whether it was the dominant or sub-dominant species. PATN analysis showed the species occurred in all habitat assemblages except for grasslands and shrublands. The report concluded that the species can persist in highly fragmented landscapes at very low densities, however, the emphasis was on woodland remnants as habitat and not scattered paddock trees. The proposed offset areas of woodland adjacent to Marthaguy Creek and of the waterway (Boothaguy Creek) with additional planted eucalypts and Belah would thus be considered a more preferred foraging habitat for the species than the scattered paddock trees even though Boothaguy Creek currently has limited roosting value.
- Duncan *et al.* (1999) in the Action Plan for Australian Bats, described one of the main threatening processes to Little Pied Bat ecology as being *"the loss of mature roost trees in inland areas, particularly in riverine environments and the removal of old buildings or damage to them."* The scattered trees proposed to be removed are not on riparian areas but the offsets are located on (Boothaguy Creek) or adjacent to (Marthaguy Creek) riparian environments.
- Shelly (2006) reported on the results of 40 week-long fauna surveys conducted over several years throughout the Central West Catchment. In a comparison of habitat types utilised by the species it was concluded that the Little Pied Bat *"occurs at significantly lower frequency over open vegetation such as grassland and/or cultivation and Lignum shrubland compared to woodland or forest types. This would indicate that while the bats preference is for utilising structured habitats it can also feed on flying insects that are not reliant on the presence of a tree canopy."* Therefore, the proposed offset areas would be the more preferred foraging habitat for the Little Pied Bat than that of scattered trees within a cleared paddock.
- A survey of tree hollow presence according to tree diameter and height was conducted by Shelly (2005) for most of the tree species in the Central West Catchment of NSW. In the case of Rosewood it was found that small hollows (<5cm entrance diameter) were consistently found in trees above 30cm dbh and medium hollows (5-15cm) consistently occur in trees above 38cm dbh. No large tree hollows (>15cm) were recorded for Rosewood at any tree diameter or height. For Wilga trees, only small diameter hollows were recorded in trees over 28 cm dbh. Belah trees recorded small hollows in trees above 44 cm dbh, medium sized hollows in trees over 53 cm and large hollows in trees above 88 cm dbh. Of the eucalypt species identified to be cleared, Grey Box consistently gave small and medium hollows when above 56 cm dbh and large hollows over 82 cm dbh. Poplar Box was found to consistently have small hollows when above 30 cm dbh, medium hollows above 41 cm dbh and large hollows over 54 cm dbh.

Therefore, it can be considered that limited roosting habitat for the species is present in the majority of trees proposed to be cleared (Rosewood, Wilga), however the larger Belah and eucalypt species do contain hollows but mostly of small size.

- Personal observations made from many surveys in the central west catchment indicate the Little Pied Bat can be found in small colonies as well as pairs and individuals. The species can also utilise loose bark on trees for roosts in addition to tree hollows, buildings and caves. Rosewood is a small tree species that generally does not have loose bark for potential roost habitat. The trade-off area adjacent

to Marthaguy Creek contains White Cypress Pine which the Little Pied Bat is known to roost under the loose bark of dead trees even though the trees rarely form hollows for roosting.

**Recommendation:**

1. It is my opinion that the Yellow-bellied Sheath-tail Bat would only have potential foraging habitat over the scattered paddock trees of the proposed development area as little roost habitat (ie. hollows >5cm) is available. The proposed offset area adjacent to Marthaguy Creek has trees at a woodland density and is considered a more preferred foraging habitat type for this species. The other offset riparian area along Boothaguy Creek would also attract more insects when wet and be a better foraging area than the scattered trees. Tree enhancement by plantings will only act to further increase foraging habitat condition with time.

2. It is my opinion that the Little Pied Bat would mainly have potential foraging habitat around the scattered paddock trees of the proposed development area. While some degree of roosting habitat is available, the species generally prefers to roost in wooded habitat rather than isolated trees. The proposed offset area adjacent to Marthaguy Creek has trees at a woodland density and is considered a more preferred foraging habitat type for this species. The other offset riparian area along Boothaguy Creek would also attract more insects when wet and be a better foraging area than the scattered trees. Tree enhancement by plantings, particularly of Belah (a favoured vegetation type) will only act to further increase foraging habitat condition with time.

**Question 2 –**

It is widely regarded that riparian zone vegetation has the ability to contain higher levels of biodiversity than most other dryland habitats. Therefore, in this case, the use of the intact creek vegetation as an offset for clearing a number of scattered to isolated trees of mixed species within a cultivated paddock is justified even though it is not 'like for like' vegetation.

Individual mature Poplar Box and Grey Box trees can have several tree hollows for wildlife utilisation, but their location and relative isolation in a cultivated field minimises their usefulness as habitat. Information provided by the CMA PVP officers of the creek vegetation indicate that there are scattered mature Belah and Poplar Box trees that would have the potential to provide hollows. Therefore, the provision of hollow resources for wildlife in one of the proposed vegetation off-sets would be at least at the same level of the number of hollows that exist in the scattered trees to be removed. It is my opinion that there would be very little fauna species that are specialised to utilising only Rosewood, Wilga, Grey Box or Poplar Box tree habitat on the central west plains, therefore, nearly all fauna would also be capable of utilising the habitat on the off-sets.

I believe that ecologically, if the vegetation to be cleared were intact remnants or patches, then the offset of a different vegetation type in a different environment such as the creeks would not be appropriate. However, the nature of scattered paddock trees has negated any concept of calling the trees to be cleared a 'community' or 'vegetation type' as there is no corresponding understorey, shrub layer groundcover or even ground habitat features such as fallen logs, debris and leaf litter. Therefore, it is my opinion that the offset of an intact area of vegetation in a high biodiversity environment such in and adjacent to a riparian zone, is a better long term ecological outcome than either leaving the scattered paddock trees or enforcing tree plantings of the same species on ground basically devoid of any of the other habitat elements.

**Recommendation:**

3. The use of the Baradine Gum ± White Cypress Pine vegetation adjacent to Marthaguy Creek as an offset for clearing trees of another species (eg. Rosewood, Poplar Box) is justified – provided the trees to be cleared are scattered paddock trees since their value to wildlife has already been significantly compromised.

4. The majority of species proposed for tree planting on the waterway of Boothaguy Creek should be those most preferred by the two bat species within the local area in addition to those already present on similar soil types. It is therefore recommended that most plantings be of Belah (*Casuarina cristata*) in the channel of the waterway with Poplar Box (*Eucalyptus populnea*) and Grey Box (*E. microcarpa*) interspersed by occasional Wilga (*Geijera parviflora*) on areas outside the channel line.

**References:**

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NPWS., 2002. *Darling Riverine Plains Biodiversity Survey Technical Report*. NSW National Parks and Wildlife Service, Western Regional Assessments Unit, Dubbo.

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Rhodes, M.P. and Hall, L.S., 1997. Observations on Yellow-bellied Sheath-tailed Bats *Saccolaimus flaviventris* (Peters 1867) (*Chiroptera: Emballon uridae*). *Australian Zoologist* **30** (3) p. 351-357.

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