

Oil mallees – native fauna sanctuaries

By **Catriona Nicholls**
Kondinin Group

As the Western Australian Oil Mallee Industry aims to plant a million hectares of oil mallees by the year 2025, primarily for economic and water use benefits, recent research shows there is the potential for habitat benefits for some of our endangered animals.

As leader of the *Biodiversity value of oil mallee farming systems* project, Dr Patrick Smith investigated the potential for oil mallee plantations to provide additional habitat for native animals. And where this appeared to occur, compared populations found in oil mallee plantations to those in natural and planted vegetation.

“Two endangered species – the woylie (brush-tailed bettong) *Bettongia penicillata* and the wambenger (red-tailed phascogale) *Phascogale calura* – were among half a dozen small mammals found foraging in oil mallee plantations in the WA central wheatbelt region,” Dr Smith said. “The mouse-sized western pygmy possum (*Cercartetus concinnus*) appears to be especially benefited by the oil mallees,” (see following story).

Researchers found that mallee plantations provide food and/or shelter for about two-thirds of the region’s bird species

i key points

- Oil mallee plantations have the potential to support biodiversity on-farm as well as providing economic and water use benefits
- The greatest biodiversity benefits come from natural bush habitat followed by mixed revegetation
- These results provide important guidelines for land managers who are planning to revegetate areas on-farm for habitat outcomes.

and more than half of the local reptiles. Hundreds of native arthropods – including dozens of species of beetles and ants – recolonise farm paddocks when belts of oil mallees are planted. The research was co-funded by the former CRC Salinity and also involved students from TAFE WA, Curtin and Edith Cowan universities.

Realistic expectations

Although important in terms of providing habitat to a range of native fauna species, oil mallee plantations still lag behind other vegetation types studied – mixed revegetation and natural bush.

The planted vegetation was at best only half as good as the natural bush habitat, so a proportional response from the native fauna is to be expected explained Dr Smith (see Figure 1).

“This result is not surprising but it is nonetheless important for two reasons,” Dr Smith said. “Firstly, it helps us have realistic expectations about the contribution planted vegetation can make to the resource requirements of native fauna species.

“Secondly, the component-by-component assessment of the habitat quality of different vegetation types identifies why planted vegetation falls behind natural habitat, allowing us to assess the degree to which these plantings might be improved with respect to their habitat values.”

The results reveal that oil mallees and mixed revegetation fall behind natural bush in two main ways:

- structurally and
- floristically.

“The structural component of habitat comprises elements such as overall height of vegetation, presence of multiple strata

ABOVE: Many native animal species were found to recolonise farm paddocks when belts of oil mallees were established. (Photo: Patrick Smith and David McFall)

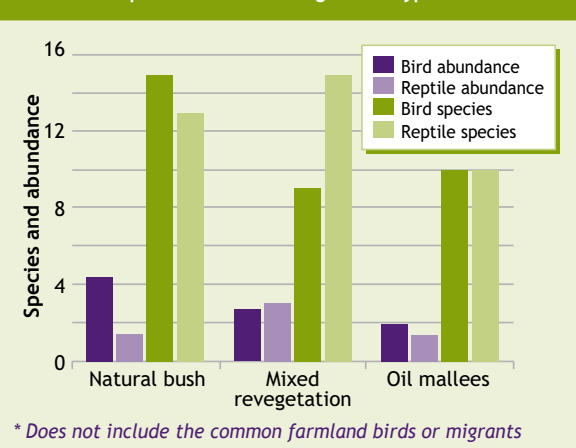


(or layers) of interconnecting vegetation, soil cover with litter and woody debris, and the presence of tree hollows,” Dr Smith said. “It is probably unimportant which plant species provide these structures or even whether the species is native or not. Many of these features are the product of vegetation age (height, hollows, dead branches) and could develop in planted vegetation as it ages.”

According to Dr Smith height and debris were starting to appear in some of the older mixed revegetation sites in the study.

Other structural features are contingent upon a diversity of plant forms being present, particularly the presence of lower strata and living groundcover – features that are almost always absent in planted vegetation unless a range of structural plant forms was deliberately introduced at the outset.

FIGURE 1. Diversity and abundance of declining resident birds* and reptiles in different vegetation types



"Management can also impact on habitat quality," Dr Smith said. "Grazing and fire management will affect characteristics such as soil cover and plant regeneration."

Diversity is the second key area in which the planted vegetation lags behind natural bush.

"This diversity affects not only the structure but also the additional plant conservation values it can contribute (more species planted equals more species conserved)," Dr Smith explained. "It also provides a greater resource diversity for other wildlife, such as dense foliage versus open foliage, smooth bark versus rough bark; winter versus summer flowering and so on."

Greater diversity and abundance of native plant species recruits occurs in mixed revegetation compared with oil mallees. This may be partly be due to oil mallee plantations often being grazed where revegetation is usually not grazed, but also because greater species diversity in the

mixed revegetation leads directly to greater species diversity in the recruits.

Such diversity in planted vegetation is primarily restricted by the species choice.

"Mixed revegetation sites in our study had less diversity than even the most degraded natural bush," Dr Smith said. "However, boosting the diversity of mixed revegetation is feasible, and considered current best practice for habitat creation."

Boosting the diversity of oil mallee plantations is less likely, although some farmers have planted diverse species mixes on inside rows of belts, with mallees planted on the outside belts where they can potentially be harvested.

Even though the results favoured natural bush over other types of vegetation, Dr Smith pointed out that any habitat value offered by oil mallees was beneficial, especially given the key focus for the plantations was usually for other reasons.

"In terms of getting the best overall biodiversity benefits from oil mallees it seems that blocks are better than belts and plantations adjacent to bush are better than isolated plantations," Dr Smith said. "Birds don't really care if planted vegetation is next to natural bush or not – they can fly over large distances, but mammals and reptiles were found only in natural bush or planted vegetation next to natural bush."

"The researchers also noted that bird activity was substantial throughout the year." 🌿

➡ More information

Dr Patrick Smith, CSIRO

T: (08) 9333 6467

E: patrick.smith@csiro.au

Plenty of appeal for tiny visitor

It's not only farmers and researchers that are attracted to oil mallees. For her Environmental Management Honours project, Edith Cowan University student Marie Short focused her thesis on the western pygmy possum (*Cercartetus concinnus*).

Throughout the broader biodiversity studies undertaken by CSIRO and FFI CRC researchers, western pygmy possums were regularly observed and Marie was keen to delve further into the potential habitat values widespread farm plantings of oil mallee stands were providing these tiny native animals.

"The use of farm tree plantations by the western pygmy possum was an unexpected discovery and so my research attempted to determine their habitat utilisation patterns in the WA southern wheatbelt region, where farmers have undertaken widespread oil mallee plantings," Marie said.

"Through my research I also aimed to understand the characteristics of farm tree plantations that provide a suitable habitat for the western pygmy possums."

Using pitfall traps already established by CSIRO, Marie monitored the numbers of western pygmy possums in the various types of vegetation and then used radio transmitters to track their movements.

"I found that oil mallees provided a rich source of feed for the pygmy possums during flowering, and pygmy possum numbers and the time they spent in the oil mallees were much higher during this period than those in other vegetation sources, such as remnant vegetation and mixed revegetation plantings (see Figure 1).

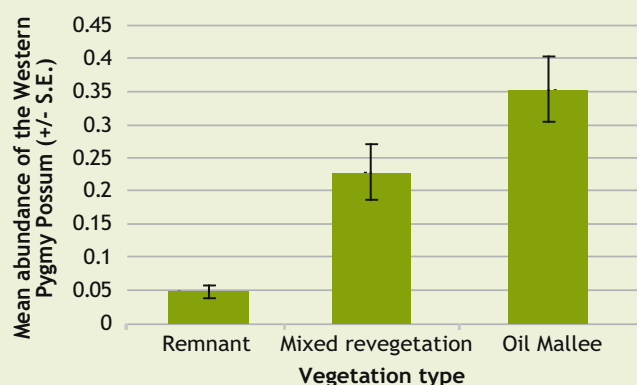
"However, it is thought that without other habitat options, the oil mallees would not sustain the population of pygmy possums out of flowering season."

Marie discovered that the pygmy possums were able to travel over several hundred metres to exploit other habitats and believes the most beneficial oil mallee plantings will be those located near remnant vegetation that can provide additional food sources and nesting sites.



ABOVE: Oil mallees provide a rich source of feed for Western pygmy possums. (Photo: Marie Short)

FIGURE 1. The average western pygmy possum abundance at sites of remnant vegetation, mixed revegetation and oil mallee plantations within the southern wheatbelt region of Western Australia



"Results from my study indicated western pygmy possums in the southern wheatbelt region that inhabit oil mallee plantations rely on the hollows of paddock trees as nesting sites. Paddock trees are important for the conservation of species such as the western

pygmy possum; too often paddock trees are cleared because nobody knows of their biodiversity benefits.

"Revegetation, particularly oil mallee plantations, has the potential to enhance conservation of wildlife, such as the western pygmy possum, in rural environments." 🌿

➡ More information

Marie Short, DEC

T: (08) 9881 9200

E: marie.short@dec.wa.gov.au