Ecology and Management of Woylie, Tammar and Quokka.

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1. DESCRIPTION.

I have attached copies of the accounts of these species from the Australian Museum's Complete Book Of Australian Mammals. You will find descriptions, basic ecological and biological information and distribution maps there.

These are all medium sized marsupials. The smallest (Woylie) is about the same weight as a rabbit and the largest (Tammar) is about the weight of a fox. Table 1 shows their mean weights and includes some other species for comparison

TABLE 1

Common name	Scientific name	Family	Weight*
Rabbit	Oryctolagus cuniculus	Leporidae	1,580g
Red Fox	Vulpes wlpes	Canidae	5,500g
Woylie (Brush-tailed Bettong)	Bettongia penicillata	Potoroidae	1300g
Quokka	Stonix brachyurus	Macropodidae	3,250g
Tammar wallaby	Macropus eugenii	Macropodidae	4,200g
Brush Wallaby	Macropus irma	Macropodidae	8,000g
Western Grey Kangaroo	Macropus fuliginosus	Macropodidae	38,500g

* mean weights taken from Burbidge and McKenzie 1989

WOYLIES are rat-kangaroos (family Potoroidae). This is a small family related to the true wallabies and kangaroos. Like kangaroos woylies hop but they hold their bodies horizontally, in fact they often appear to be hunched over. This contrasts with the much more upright posture of kangaroos. They have short faces, small ears and long tails that are tufted. You will see these features if you catch one in a spotlight because they move slowly when dazzled by the light

If you flush one during the day it will probably "explode" from a bush right under your feet. You may see a small brown body hurtle through the bush, zig-zaging now and then before it disappears. You may well see the long, tufted tail (longer than the head and body: bandicoots have much shorter rat-like tails) but you will be lucky to see much more detail.

QUOKKAS should be familiar to most West Australians who have visited Rottnest. On the mainland you are unlikely to see one because they live in extremely dense swampy places. However, get on your hands and knees in a well used quokka swamp and you will find their tunnels are clear open

"roadways" under a mat of rushes etc. The tunnels are almost big enough for you to force your way along; those of bandicoots are much smaller. If in doubt you should not have to look far for their characteristically square droppings

TAMMARS are typical small wallabies. They have distinctive face patterns that should make it easy to distinguish them from young Kangaroos and Brush Wallabies. They often favour thickets, but can be seen in fairly open country at night.

2. STATUS AND DISTRIBUTION

WOYLIES are declared threatened under Section 14(2) (ba) of the Wildlife Conservation Act. A recovery Plan funded by ANCA is in its second year of implementation. The plan covers Western Australia and South Australia. The plan was initially written for ten years but encouraging news about their response to fox control in the Batalling Forest as well as indications that they are much more wide spread in the Southern Forest Region than previously known has caused the Recovery team to revise the plan to cover two more years and then be reviewed.

Their distribution indicated on the attached map under represents the extent of their former distribution in the arid zone; Andrew Burbidge and Phil Fuller discovered from Aboriginal people that they existed through the Great Sandy Desert and adjacent parts of the Northern Territory.

Today they occur in WA at:
Dryandra
Tutanning
Boyagin (translocated there last year)
Batalling (probably progeny of animals translocated by Per Christensen)
Perup (it also course at Kingston and in the lake Muir area - are these
separate populations or has the Perup population expanded?)
? Fitzgerald River (there are unconfirmed reports).

In SA there are populations on some offshore islands and in Yookamurra Sanctuary. However all these populations are derived from WA stock.

We plan to introduce woylies to Julimar (in WA) and Venus Bay Nature Reserve on the SA mainland If operation foxglove is a success we may also introduce them to other areas of the northern jarrah forest

QUOKKAS are on the reserve list. They have always been confined to the south west of WA from about Mundaring south along the high rainfall edge of the Darling Scarp and through swampy areas and probably heath lands south of Bunbury. They occur along the south coast to Mt. Many Peaks and they are in moist gullies in the Stirling Range. There are two important island populations, on Rottnest and on Bald Island.

Toady they stiil occur through much of this range, at least south from Jarrahdale. However it seems that they have disappeared from some creeks along the Scarp and they are much less abundant than they used to be in many others. Because of the very thick habitat, Quokkas could easily disappear without being noticed so it is important to locate populations and monitor them periodically.

TAMMARS are declared threatened under Section 14(2) (ba) of the Wildlife Conservation Act. A recovery Plan was written for the species in 1991 but we were unsuccessful in securing funding to implement it. However the species is secure on the Wallabi Islands, Garden Island and on two islands in

the Archipelago of the Recherche off the south coast of WA. The SA inland subspecies is probably extinct but the WA subspecies is present at Dryandra, Boyagin Tutanning and Perup. There was a population in Kalbarri NP until recently and there may be populations elsewhere in the Wheatbelt and South Coast Regions (eg. Fitzgerald River.)

3. MANAGEMENT.

POTENTIAL AND REALISED RANGE.

An animal's niche is that combination of environmental parameters that provide conditions within which the animal can live. Its potential range is the area in which its niche requirements are met but its realised range may be smaller than its potential range if some factor(s) excludes it from parts of its potential range.

The disappearance of the Woylie, for eg, from most of its former range implies that some factor(s) have made much of its potential range unsuitable. If we are to prevent the decline continuing, perhaps to extinction, or better still, reverse the decline, we need to identify the factor(s) and through management, alter them to a regime that is tolerated by the woylies.

Where the landscape has been fragmented by clearing or where we may want to achieve a major extension of range in a short time, we may have to translocate animals after we have identified and modified the factors that eliminated them from their previously realised range. Occasionally we may need to introduc them to areas that they did not previously occupy (such as islands).

There have already been several translocations of Woylies and it may be expedient to translocate the other species in the future, particularly if proposals to reconstruct faunas in selected areas come to fruition. However this is beyond the scope of this course unit.

PREDATION AND FIRE

There are two particularly important factors that affect the availability of potential habitat for these species on the south west mainland. Often they are inextricably interrelated. The most important is predation by foxes. In the case of woylies and tammars there has been a dramatic increase in population density wherever foxes have been baited. Indeed the places where the last few animals have held on have been in Dryandra, Tutanning and Perup, all places with abundant thickets of poison bush (Gastrolobium). It seems likely that fox numbers were lower there because of secondary poisoning effects.

The other factor has been cover. The density of cover is, of course related to fire. Fire removes dense vegetation, but with time it recovers and then, in many cases decreases as short lived shrubs degenerate. This scenario is true of poison thickets in Perup where the use of fire to maintain habitat, particularly for tammars has been advocated and certainly it provides good habitat.

However, let us consider quokkas. It seems from the accounts of old-timers that quokka hunting was a popular pass-time in pre-1930s. Today one would have little hope of getting any because they are confined to such dense vegetation that they usually have to tunnel through it. It is likely that quokkas used to have a much wider realised niche than they do now. Today they are confined to sites that are so dense that they can avoid foxes. Fox baiting may well see quokkas again occupy heathlands on the south coast and perhaps other more open sites - look at their habitat on Rottnest!

There is one very important point about quokka habitat and fire. As indicated above quokkas seem to have become scarce or have vanished &from some of the creeks along the scarp. This may well reflect susceptibility to predation" after fire has burnt their swampy thickets. Per Christensen found that if part of a swamp was burnt, quokkas moved to the unburnt part but visited the other area to feed until it was

again thick enough for them to live in.. If possible quokka swamps should not be burnt, but if they are, fox control is vital in the area until the swamp is again very thick.

CONCLUSION

Islands provide relatively secure habitat for quokkas and tammars in WA. There are no island populations of woylies except in SA (introduced and? highly inbred WA stock)

All three species are CWR mammals and all are susceptible to fox predation.

All three have declined, but to varying degrees. They have persisted where there is either very thick cover (especially quokkas) or an abundance of poison bush or both.

It is not clear how important thick vegetation is as a primary component of their niche requirements. In the absence of fox predation they may be able to live in more open sites than they generally do today. Never the less fire management of habitat is important and protection from foxes is probably most vital when fire has reduced the availability of thick vegetation.