RZZSA – FOUNDATION FOR A RABBIT-FREE AUSTRALIA.

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The greater bilby, *Macrotis lagotis*, is a small nocturnal marsupial that inhabits the arid and semi-arid regions of central and western Australia. It is one of a suite of mammalian species within the critical weight range (CWR, 35-5500g) that have been particularly vulnerable to decline since European settlement (Burbidge and McKenzie 1989; Morton 1990). The original distribution of *M. lagotis* spanned approximately 70% of the Australian mainland (Southgate 1990), encompassing a variety of different habitat types and climatic zones. These included temperate woodlands in southern Australia to arid deserts in the central regions. This indicates a species able to adapt to a wide range of conditions. The bilby has declined rapidly since European settlement and now occupies just 20% of its former range and may still be in decline (Southgate 1990).

Although the bilby has been the subject of several reintroduction attempts, only those on predator-free off-shore islands or in mainland exclosures have so far been successful (see Southgate 1994; Moseby & O'Donnell 2003). Due to the rarity of the species, and its nocturnal and fossorial habits, there is a scarcity of data on the habitat requirements and factors that limit the species. Moreover, while reintroductions provide an opportunity to address this problem, previous attempts have not been intensively monitored and the optimal requirements of a bilby population remain poorly understood. Bilbies have been reintroduced to two sites on the mainland of South Australia in recent years. Both sites are predator-free exclosures. Venus Bay Conservation Park (see attached photo) is located in a semi-arid region on north-western Eyre Peninsula, is subject to seasonal conditions and receives 375mm annual rainfall. The park is dominated by coastal mallee scrub and acacia shrubland. The Arid Recovery Reserve (see attached photo) at Roxby Downs comprises chenopod shrubland and acacia dunes. The climate is arid with unpredictable rainfall, averaging 166mm per year. Bilbies are known historically from both regions.

This study aims to improve the ecological knowledge of this species by investigating its habitat requirements, factors that may limit the species, and how bilbies utilise the habitat available to them. During the last 12 months, I have conducted 4 field trips to each site at different times of the year to determine any seasonal differences in habitat selection and movement patterns. Venus Bay was visited in November 2003, January, March and August 2004 and Arid Recovery in May/June, July, September and October 2004. At each site a number of bilbies were captured using cage traps (see attached photo) or handnets, body condition assessed and radiotransmitters attached to the tails (see attached photo) before being released. Each animal was then radiotracked daily to a diurnal burrow and the burrow characteristics recorded (GPS location, orientation, entrance number and position relative to vegetation or cover) to determine preference for any particular burrow types. This could be important in formulating management strategies as a number of other species utilise bilby burrows, in particular rabbits.

Each bilby was also located several times throughout the night during their activity period. Due to the differences in size and habitat types between the two sites, different methods are used. Radiotracking is done on foot at Venus Bay, which allows direct observation of the animal's location and activity but has the potential to disturb the animal's normal behaviour and is quite labour intensive. Telemetry towers (see attached photo) are used at Arid Recovery to triangulate the animal's position. This method allows many more positions to be recorded throughout the night but direct observation of the animal is not possible. The positional data obtained from radiotracking is overlaid onto a map of the area and analysed using a GIS program (Arcview) to give home range size, spatial organization, movement patterns and habitat selection.

Preliminary results show males and females exhibit very different patterns. Females tend to stay fairly localised with small home ranges and do not forage far from their diurnal

burrow. Male home ranges are much larger and may travel several kilometres in one night. One of the factors that can influence home range size is the availability of food as an animal must be able to satisfy its food requirements from the area it forages in. The bilby is omnivorous and constructs shallow digs for seeds, bulbs, roots and invertebrates. Pitfall traps and soil sampling have been used to quantify food availability at each site and is likely to vary in response to seasonal conditions. While female home ranges may be influenced by food availability, the large size of male home ranges indicate that food is not a limiting factor and is likely to be influenced by other factors such as access to females.