Department of Environment and Conservation
Our environment, our future

Fauna notes

Information about Western Australia's fauna

No. 28 Long-haired rat or plague rat

Description

The long-haired rat or plague rat (*Rattus villosissimu)s*, is one of a large number of rodents native to Australia. It is found in northern parts of mainland Australia where its populations sometimes reach plague proportions.

The long-haired rat is larger than most other native rats. It is 12-22 cm in body length, 10-18 cm in tail length and 50-280 g in weight. The long-haired rat is light grey in colour with long black guard hairs that give them an overall dark grey appearance (Figure 1). It lacks the lateral tan colour or brown colouration common in other species.

Figure 1 Long-haired rat or plague rat (*Rattus villosissimus*) Photo: Tony Robinson © Viridans Images.

Distribution and habitat

In Western Australia, long-haired rat s are found in the Kimberley region (Figure 2). Their occurrence in this State appears to be recent, because the first specimens were collected south of Halls Creek in 1968 (Figure 2). Long-haired rats are periodically trapped in the Ord River irrigation area at Kununurra where they reached plague numbers in 1983 and high numbers in 1996.

Long-haired rat s occur in sub-tropical, temperate, desert and hummock grassland areas. When in plague numbers they occur in virtually every habitat, including along water courses and around homesteads and outbuildings on farms and pastoral leases. In Queensland, they invade cultivated pastures such as Sorghum *Sorghum bicolor* and Oats *Avena sativa*, but they generally need either dense vegetation or burrows for shelter. The rats can only survive for about 13 days without green vegetation or water.

Long-haired rats are usually uncommon, living in widely scattered refuge populations near bore holes and other wet areas. Numbers increase when the rats reproduce locally or immigrate from elsewhere. Trapping during the 1983 Kimberley plague showed that the high numbers resulted from increased reproduction in the Ord River area and not from immigration. The return of arid conditions, combined with the effects of predators (and possibly a decrease in rat health) results in population declines. The rats are then restricted to small refuge areas where they have access to food and water.

Diet

In their natural habitat, the diet of long-haired rats includes the roots of desert grasses, herbs, succulent plants, seeds and some insects. In agricultural areas, they feed on a variety of crops including Rockmelons *Cucumis melo*, Maize *Zea mays*, and Sunflowers *Helianthus annuus*.

Breeding

Long-haired rats can breed throughout the year, as long as suitable food is available. Litter size varies from 5-10, but can increase to an average of 12 under plague conditions. The gestation period is 22-24 days, the oestrus cycle takes 4-5 days and females can mate directly after they have given birth. Young rats, which are pink and naked at birth, open their eyes at 17 days and can be weaned at 21 days. Although young animals can begin breeding at approximately 62 days of age, they normally reach sexual maturity at 70 days.

During the 1983 plague in Western Australia, the rats bred from January to July (late wet season to early dry season) and peak breeding occurred in April and May. Litter sizes of up to 20 were recorded.

Behaviour

Long-haired rats are nocturnal and terrestrial. Their nocturnal activity seems to be influenced by the availability of ambient light. For example, one study found that tagged animals were not active on the surface while the moon was above the horizon.

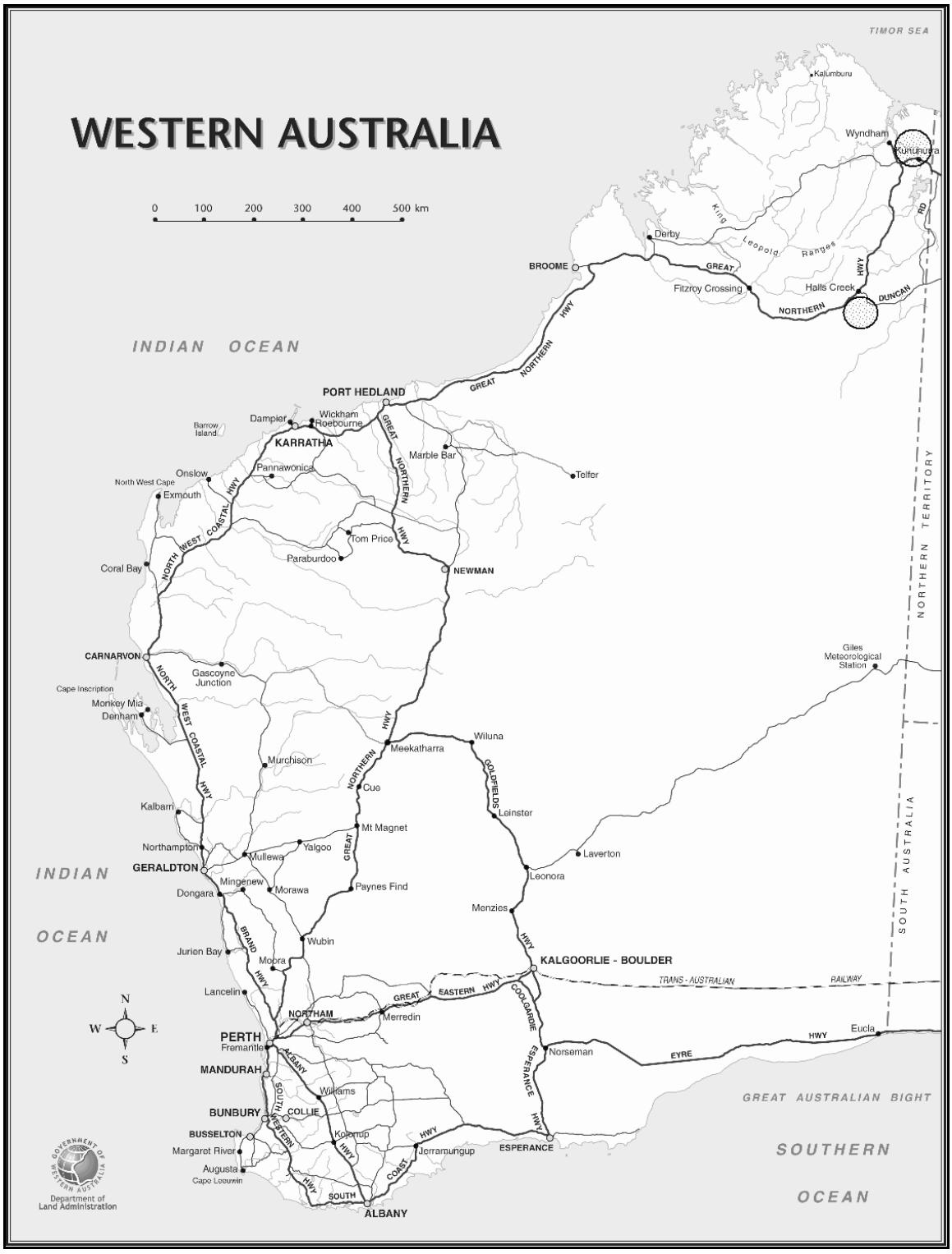

Figure 1 Generalised distribution of the Long-haired rat (*Rattus villosissimus)* in Western Australia.

The activity of long-haired rats is centred on their burrows where they rest during the day. They move across open areas, but stay close to cover. In one study, the rats used two types of burrows. One burrow consisted of a simple tunnel (up to 0.5 m deep), joining two entrances and contained no bedding. The other burrow (up to 0.8 m deep) had multiple entrances, an extensive tunnel system and contained grass bedding. Both types of burrows are associated with vegetation, with the entrances usually under cover.

Damage

Damage to rockmelons and maize in the Ord River valley in 1983 was estimated at 2-15% of the crop. Sunflower crops can also be damaged by rats climbing the stalks and eating the soft parts of the stems immediately below the flowers. Seedling maize and chick peas may also be eaten.

During rat plagues, the Letter-winged Kites *Elanus scriptus*, Black Kites *Milvus migrans*, Dingoes *Canis lupus dingo*, Cats *Felis catus* and snakes increase in number as a result of the increase in food supply.

Status and damage reduction

The long-haired rat is a declared pest of agriculture under the provisions of the *Agriculture and Related Resources Protection Act 1976*, administered by the Western Australian Department of Agriculture and Food. This declaration allows for the approval and implementation of a management program in various areas of the state.

As a native species the long-haired rat is also protected under the provisions of the *Wildlife Conservation Act 1950*, administered by the Department of Environment and Conservation (DEC). Long-haired rats can only be destroyed on private land after a damage licence has been obtained from DEC, except where an open season has been declared. For management options see the table below.

Trapping is carried out each year by staff from the Western Australian Department of Agriculture and Food in an effort to assess the probability of a plague. In the event of a plague, specified poisons are combined with the removal of vegetation in which the rats shelter from uncropped areas.

References

Predavec, M. and Dickman, C.R. (1994) Population dynamics and habitat use of the long-haired rat (*Rattus villosissimus*) in south-western Queensland. *Wildl. Res*. 21:1-10.

Walton, D. (ed) (1989) Fauna of Australia (Volume 1B. Mammalia) Australian Biological Resources Study. Australian Govt. Publishing Service, Canberra

Wheeler, S.H. (1989) Superabundance to rarity: the reproduction, numbers and dispersal of *Rattus villosissimus* (Waite) in the Ord River Irrigation Area, Kununurra, WA. Agriculture Protection Board, Unpublished Report.

Redhead, T.P. (1983) Long-haired rat, *Rattus villosissimus*. In. Complete Book of Australian Mammals. (Ed. R. Strahan.) Angus and Robertson, Melbourne.

Watts, C.H.S. and Aslin, H.J. (1981) Rodents of Australia. Angus and Robertson, Sydney.

Baverstock, P.R. (1976) Water balance and kidney function in four species of Rattus from ecologically diverse environments. *Aust. J. Zool*. 24:7-17.

Calaby, J. (1974) *Rattus villosissimus* (Waite) – a new mammal record for Western Australia. *Rec. West. Aust. Mus*. 3: 82-83.

Taylor, J.M. and Horner, B.E. (1973) Reproductive characteristics of wild native Australian *Rattus* (Rodentia: Muridae). *Aust. J. Zool*. 21:437-475.

Further information

Contact your local office of the Department of Environment and Conservation.

See the Department's website for the latest information: www.dec.wa.gov.au.

Options for reducing damage caused by long-haired rats

Option	Application	Benefits	Costs
Management of uncropped areas	Includes grasslands or uncropped headland channels. Ploughing or burning every season keeps rat harbourage to a minimum.	Low cost solution.	Must be repeated each season.
Encouraging birds of prey	Installing perching poles and protecting native vegetation provides nesting sites.	Low cost solution.	Must be combined with other control measures. Anti-coagulant rodenticides must be used carefully so as not to affect birds of prey.
Poisoning	Only possible under strict controls. Damage licences must be obtained from DEC.		

.

Last updated 25 June 2009

Further Information
Contact your local office of the Department of Environment and Conservation.
See the Department's website for the latest information: www.dec.wa.gov.au.

Department of Environment and Conservation
Our environment, our future