



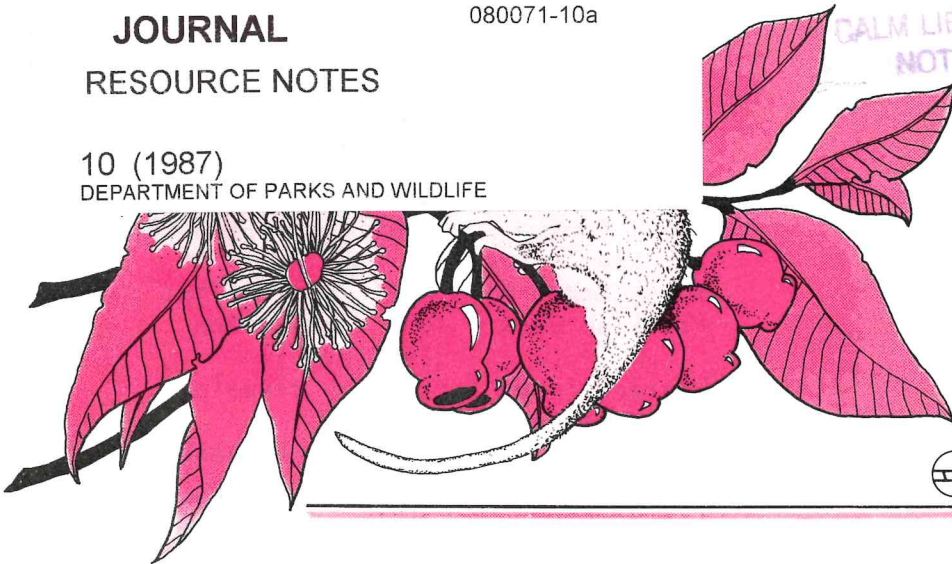
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# Resource Notes

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## THE REASONS FOR RARITY

Why are so many species rare and endangered? Sometimes there is a simple explanation, but often the reasons are complex or not properly understood.

Extinction is a natural process. Even before the first European settlers arrived in Australia some species were already rare. Increasing aridity since the last ice age and competition from other species could both have contributed to rarity. Hunting and land management practices of the Aborigines also affected many species. However, the rate of extinction has increased markedly since the arrival of Europeans and is a result of changes that people have wrought on the environment.

Land clearing: The vast majority of species are so well adapted to their natural environment that they cannot survive elsewhere. Land clearing, mainly for agriculture, has been extensive in much of the south-west of Western Australia and has destroyed all the habitat of some species and most of the habitat of many more. Other land uses that can destroy habitat include mining, urban development, road and dam construction and pine plantations.

Many species now occur only in remnants of native vegetation, often only in nature conservation reserves.



Because of the complex interactions that occur between species, small reserves may not always contain everything a species needs to survive. For example, some plants depend on one species of insect to pollinate them. If the reserve does not also contain habitat for the pollinator the plant will eventually die out.

Land degradation: Even land that has not been cleared can change dramatically. Grazing by domestic stock like sheep and cattle can lead to selective removal of some plants and overgrazing and trampling can cause soil erosion. Weeds have invaded some areas. Clearing often results in changes in the water table and increasing salinity of streams and lakes. Several species introduced by man have also degraded the environment through grazing - rabbits, pigs, goats, camels and donkeys have affected the environment in various parts of the State. Disease is another factor. By far the worst disease is the root-rot fungus, often called "dieback", which kills a wide variety of plants and is virtually destroying increasing areas of native vegetation. Timber cutting, road and dam construction, mining and other activities can also lead to land degradation.

Fire: Aborigines used fire to flush game, for the regeneration of food plants, for signalling, as well as for many other purposes. There is much evidence that this led to massive changes in vegetation and species diversity during the 40 000 or more years that they have lived here. When Europeans arrived they had a different attitude to fire and used it in ways that had different effects on the vegetation and the animals that depended on it. In the deserts, when Aborigines abandoned their nomadic lifestyle for settlements, we know there was a dramatic change in fire patterns. Where once there were numerous small fires lit throughout the year there are now infrequent, but very large summer wildfires occurring every few years.

Similarly dramatic changes occurred in other parts of the State. For example, in parts of the south-west cattle farmers burnt the scrub very often because this brought on young growth suitable for browsing. This reduced the amount of cover and breeding habitat available for some animals and eliminated plants that regenerate only from seed and take many years to flower.

Predators: Europeans released two predators - the feral cat and the fox - that have adapted very well to Australian conditions and are now widespread. Unfortunately, many of the indigenous mammals, such as wallabies and bandicoots, and some other animals, such as the Western Swamp Tortoise, were not adapted to these predators and have declined or become extinct.

Hunting: If hunting of common animals is controlled it does not lead to rarity. Hunting, including live capture for pets, can have a major effect on rare animals, as can digging up whole rare plants for horticulture.

Because of the large number of possible causes of rarity it is often difficult to know the exact cause of a particular species' decline without detailed studies. Often studies conclude that more than one of the above factors have combined to affect a species. Some well known Western Australian examples of rare species

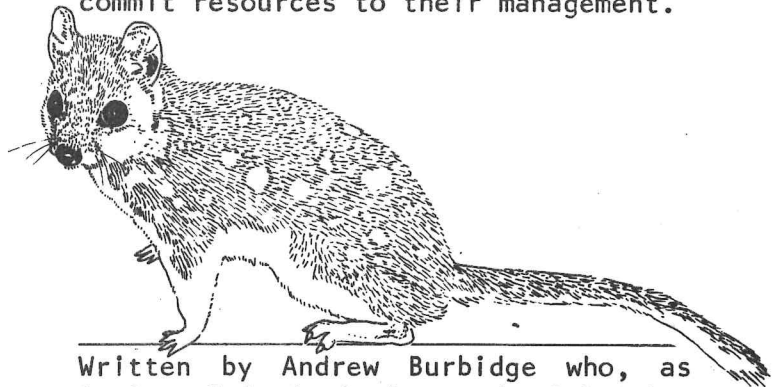
and the probable causes of their rarity are:

Numbat - clearing, fire, predators.  
Woylie - clearing, fire, predators.  
Black-footed Rock-Wallaby - predators.  
Fur Seal - hunting.  
Noisy Scrub-bird - fire, clearing.  
Freckled Duck - land degradation (salinity).  
Western Swamp Tortoise - clearing, drainage, predators.  
Some banksias - clearing, disease.

Unfortunately, many species are already extinct. Some that are extinct in Western Australia and the probable causes of their extinction are:

Pig-footed Bandicoot - fire, predators.  
Desert Bandicoot - fire, predators.  
Broad-faced Potoroo - clearing, habitat degradation.  
Rufous Bristle-bird - land degradation, fire.  
Lewin's Rail - land degradation, fire, predators.  
Merrill's Triggerplant - clearing and grazing.  
*Gastrolobium lehmannii* - clearing.

What can we do to prevent further extinctions? We must develop a new attitude to natural land and ensure that we understand the consequences of our actions before making major changes to land use. We must ensure that no more pests or weeds are introduced and we must learn how to improve habitat rather than degrade it. We must learn how to reverse the trend towards extinction, and especially, we must reserve areas of land for nature conservation and commit resources to their management.



Written by Andrew Burbidge who, as Senior Principal Research Scientist for CALM, has established conservation strategies for rare species in Western Australia.