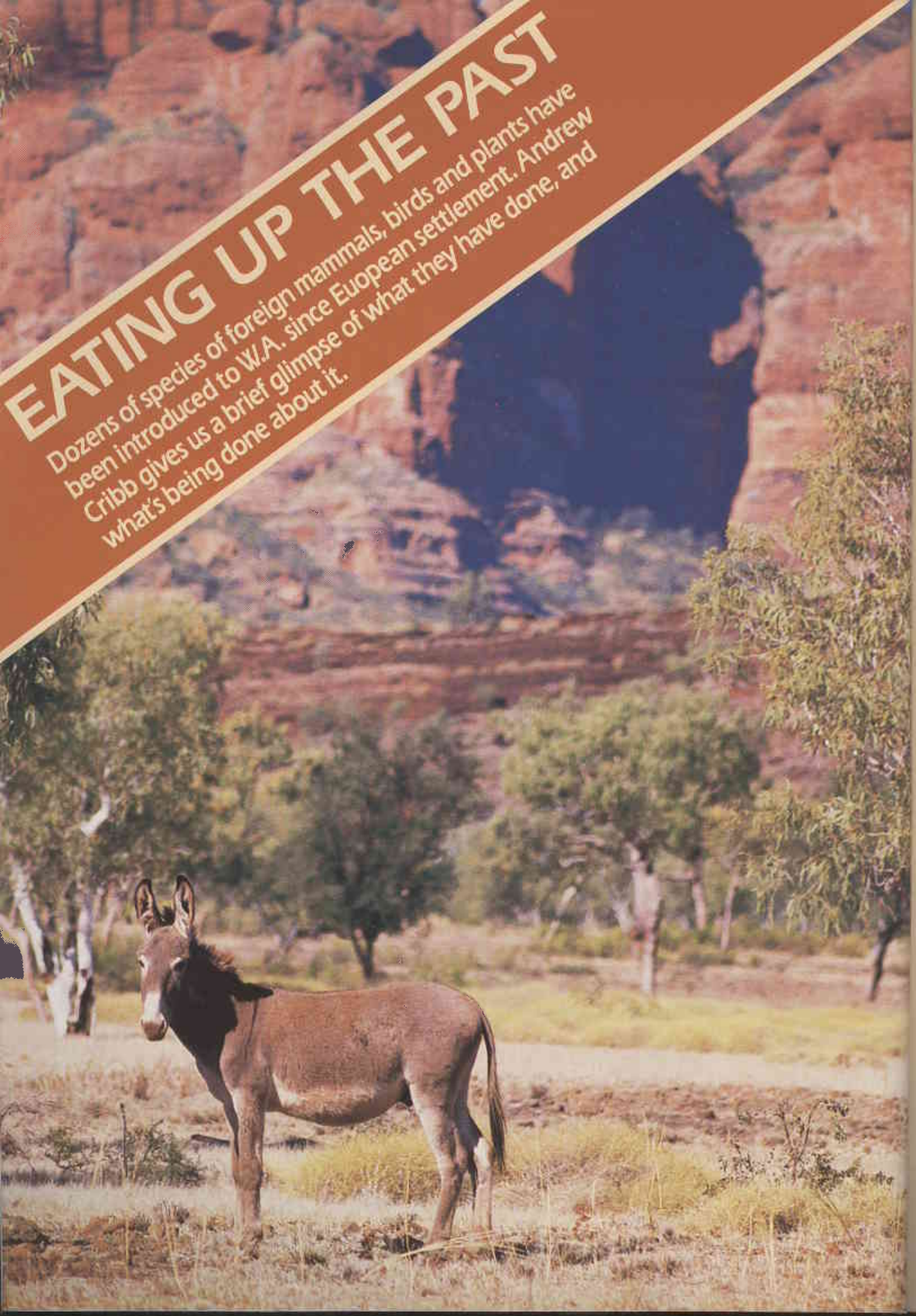
EATING UP THE PAST

Dozens of species of foreign mammals, birds and plants have been introduced to W.A. since European settlement. Andrew Cribb gives us a brief glimpse of what they have done, and what's being done about it.



We often think of extinction as part of history, and relegate it to the safe distance of what's done is done. Few people in W.A. realise that it is less than 15 years since populations of many of our surviving native mammals took a sudden dive, a dive which brought most of them to the brink of extinction, and from which few have recovered except in isolated pockets.

In the 1970s numbats, woylies, tammar wallabies, wambengers, rock wallabies, ringtail possums, bandicoots and chuditches all began to disappear from areas where they had previously been common, or at least known.

Many of the causes are still unclear, but some of the factors have been established beyond reasonable doubt. Probably the most important of these are the effects of foreign plants and animals introduced by Europeans since 1788.

One of the great challenges facing conservation agencies this century is to develop methods to control these imported competitors, and protect native species from their impact.

At present there are 13 species of imported mammals in W.A. Seven of these are feral, that is they have reverted to the wild. Feral animals in W.A. fall loosely into two groups: herbivores, and predators.

Browsing and grazing animals can wreak havoc with the native environment, changing it so radically that native species of both plants and animals can no longer survive in that area.

Predators put pressure on the small, and often isolated, populations of native mammals that have survived. Often numbers are so low that just a few breeding animals lost to predators will reduce the population below a viable size.

The Rogues' Gallery

Browsers and grazers probably have the greatest effect on the environment.

Rabbits are notorious as vegetation destroyers. A recent survey of the Nullabor region served to reinforce the picture of what they can do in large numbers. One third of the Great Victoria Desert Nature Reserve was found to have been almost completely stripped of vegetation by rabbits in recent years. Once a population of rabbits is well-established native habitats go by the board.

Feral pigs are another successful coloniser, but they favour areas near water almost exclusively. In arid regions pigs congregate in watercourses and near waterholes during summer, but after rain may spread out into the surrounding country. In the south-west forests there are no such constraints on their movement.

There is little evidence to suggest that pigs are great consumers of other wildlife, although their omnivorous eating habits make them suspect. What they obviously do is make their favourite spots thoroughly unpleasant, or uninhabitable for other species.

In forest regions pigs like swamps. Swamps and watercourses are also the habitat for many species of small marsupials, including the quokka, once thought extinct on the mainland. Once a mob of pigs has moved into a swamp, and wallowed, rooted and generally trampled everything flat, there isn't much attraction in it for a quokka.

Wild pigs have also long been suspected of helping spread the dieback fungus *Phytopthora cinnamomi*. Their habit of rolling in mud, then moving off and rolling in more mud elsewhere in the forest, can apparently spread the disease to uninfected areas. Pigs can also carry diseases which threaten human health.

Goats also do their share of modifying the environment, and W.A. has one of the largest feral goat populations in Australia. Goats prefer rocky overhangs for shelter, thickets of trees and dense scrub. In these habitats they compete specifically with rock wallabies. Because they browse selectively, they thin out their preferred food plants, which are replaced in the vegetation community by plants they don't care for. In a short period of time they can totally change the vegetation of an area. As with other herd animals trampling and over-use of any one pad can cause serious erosion, particularly in semi-arid regions.

Grazing by introduced livestock is another harbinger of environmental change.

Scattered through the savannah woodlands of the north-west Kimberley are relict pockets of rainforest that have somehow survived the wildfires and changing climate of the last 100 million years.

The closed canopy of the rainforests maintains a shady, moist 'microclimate' in which many specialised species survive and thrive.

In the dry season fires regularly burn the grass understorey of the surrounding savannah woodlands, but seldom enter the moist environment of the rainforests.

These patches were first examined by researchers in 1977. They made observations and collected specimens of moisture and shade-loving plants and animals, all of which were specifically adapted to life in a rainforest environment.

The research team returned this year to the Kimberley and found the rainforests contracting. Circumstantial evidence suggested an explanation.

The canopies of some patches had opened out, grasses were invading the clearings, and woodland species of snails and birds were seen feeding, where previously there had been an almost impenetrable thicket occupied exclusively by rainforest species. What had caused this dramatic change? Some, at least, of the culprits were caught red-handed.

Seeking shade during the heat of the day, cattle trample the rainforest edge, opening clearings in its vegetation and allowing the invasion of savannah grasses. Once the grasses are established they carry fire past the moist perimeter. A succession of fires, and the rainforest gradually opens out, ultimately to be replaced by the savannah.

In cattle country most of the rainforest patches are today restricted to the rugged screes that cattle cannot penetrate, and areas where rock outcrops or watercourses act as natural firebreaks.

Sheep also cause serious environmental damage over great areas of W.A. Although rarely running wild, the huge flocks on our pastoral lands are changing vegetation structures and causing erosion and soil compaction around waterholes and streams. Sheep are also the main threat to the valuable sandalwood tree, as they graze all the seedlings that occur on pastoral land.

The Predators

Foxes arrived in W.A. in the early 1900s, and by the 1930s they had spread as far as the Kimberley. The only place they haven't been sighted as yet is the wet tropics in the far north of Australia.

Foxes prey on a wide range of other animals. In areas where only small populations of native mammals remain they are a very real threat to the survival of the native species.

This was clearly demonstrated in a study by Jack Kinnear and his team from the CALM research centre at Woodvale. From 1978 onward five populations of rock wallabies in the Wheatbelt were studied, two of which were protected from foxes by a baiting program. Not only did the protected populations grow, but the unprotected populations remained at the same low level, and one waned to the brink of extinction.

The total population of rock wallabies at the start of the study was estimated to be about 75 animals, split amongst five granite outcrops. A fox would probably have to dine off rock wallaby only six times a year from any one outcrop to put its population at risk of extinction.

Similar results were recorded by Per Christensen and his research team from Manjimup when working on woylies and numbats in the Perup Fauna Priority Area, in jarrah forest east of Manjimup.
These studies raised the question of whether it was

Photo courtesy A.P.S.

Pet rabbits are a small child's delight, but once in the wild they can strip an area bare of vegetation in short order.

Photo courtesy A.P.S.

The Major Feral and Exotic Mammals in W.A.

Oryctolagus cuniculus European rabbit
Mus musculus House mouse
Rattus exulans Polynesian rat *(Adele Island only)*
Rattus rattus Black rat
Rattus norvegicus Brown rat
Canis familiaris Dog
Vulpes vulpes Fox
Mustela putorious Ferret, polecat
Felis catus Cat
Equus caballus Horse
Equus asinus Donkey
Sus scrofa Pig
Capra hircus Goat
Camelus dromedarius Arabian camel

Native species at high risk from foxes

Dasyurus geoffroii The western native cat or chuditch
Phascogale calura Red-tailed wambenger
Myrmecobius fasciatus Numbat
Bettongia penicillata Woylie
Petrogale lateralis Black-footed Rock-Wallaby
Macropus eugenii Tammar Wallaby
Pseudocheirus peregrinus Western ringtail possum
Pseudomys shortridgei Heath rat
Pezoporus wallicus Ground parrot
Pseudemydura umbrina Western Swamp turtle

Feral pigs can do immense damage to the environment as these pics of Kalbarri National Park (below right) and Serpentine Dam (bottom) show.

Officers from the Agriculture Protection Board weigh a 96 kg boar caught in the Darkan area.

Photo courtesy A.P.B.

Photo courtesy A.P.B.

Photo courtesy A.P.B.

Photo courtesy A.P.B.

possible or not to protect larger conservation reserves from foxes.

No-one can place the introduction of the feral cat accurately, but they were probably here before the Parmelia. They are the only animal listed as feral given a name by the Aborigines, and may have found their way ashore originally via shipwrecks of Malay traders. Cats have spread throughout Australia, from island reserves and the Gibson Desert to the lush forests of the South-West.

Cats are described by biologists as 'opportunistic' feeders, that is they eat whatever is available at the time. The stomach contents of feral cats confirm this. Since their introduction cats have established themselves in the food chain. They are efficient predators, and like the fox may contribute to the disappearance of some species.

Outfoxing the Fox

A new program to control foxes in conservation areas will be launched this year by CALM. Thirteen species of native mammals in W.A. are considered at high risk from the fox, and have been listed as priorities for protection.

Funded partially by the Department and partially through a grant from the Australian National Parks and Wildlife Service, the program is aimed at finding an efficient and economic method of reducing fox populations in conservation reserves, without having an adverse secondary effect on native fauna of the area.

Three representative areas have been selected for the pilot program: Kalbarri National Park, Nangeen Nature Reserve, and Perup State forest.

The program will use 1080 baits. The active ingredient of 1080 is sodium fluoroacetate, which occurs naturally in many species of plants throughout the South-West and Wheatbelt. As a result most of W.A.'s native animals, both grazing and carnivorous, have an inbuilt tolerance to the poison; foxes don't.

Manipulating bait size, the type of bait, and where it is placed can all help to make baits target specific. Collaborative studies with the Agriculture Protection Board have demonstrated this is feasible.

The problem with baiting foxes is that the moment the population is reduced in one area, other foxes from outside move in to occupy the vacant territory. One tactic the program will test is establishing a ring of baits on the reserve boundary, after fox numbers have been reduced in the reserve itself.

In the long term the idea is to keep populations of native mammals in existence until some means of biological control for foxes becomes available. With advances in genetic engineering and molecular biology the answers may well be within reach.□

Foxes: The last straw? In conservation reserves where only small populations of native mammals survive foxes don't have to eat native very often to tip the balance toward extinction.

Photo courtesy A.P.B.

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COVER PHOTO:
Stark silhouettes evoke the spirit of our remote regions. This photograph was taken near Quairading by Hans Versluis.

EDITORIAL

Public participation in land management sounds like a great idea: the community has a chance to study and comment upon the government's proposals. The scientists and managers can keep their fingers on the pulse of public demand. But sometimes good ideas are hard to put into practice.

Last April the Department of Conservation and Land Management released draft management plans for the south-west forest regions, and a draft timber strategy for W.A. The release of the plans was accompanied by a series of workshops and public meetings, and extensive media releases. Four hundred and thirty-five letters offering briefings and speakers were sent out. Ninety groups responded. Public comment on any aspect of the plans and the strategy was invited.

4070 responses were received. This included 3505 proformas (from 30 organisations) and 565 substantial submissions, some up to 200 pages in length. Many submissions endorsed the plans in their entirety; some rejected them out of hand; others suggested hundreds of minor changes.

How can so many, and such varied, views possibly be integrated simply and sensibly into a final plan? What weighting should be given to the views of different groups or individuals? Who decides what is 'right' when pure value judgements are to be made and values are in conflict? How should one resolve an issue when the views of a large section of the public are quite different from those of a small group of scientists working closely on the problem? These questions represent the sharp end of public participation. It's a relatively new game for W.A.'s land managers, and one in which the rules are still unwritten and ill-defined.

What is certain is that the Department's policy and planning staff have a big job ahead of them, and a job which must be done to the highest possible professional standard. It is important that the final plans for our south-west forests reflect the tremendous thought, effort and interest shown by the community; and it is essential that there are efficient mechanisms for public involvement in conservation and land management, because these processes will be the norm, not the exception in years ahead.

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