A Biological Survey of the Eastern Goldfields

by Dr. Andrew A. Burbidge, Chief Research Officer, W.A. Wildlife Research Centre and Chairman, Biological Surveys Committee.

Biological surveys provide the basic information about animal and plant distributions which is vital as a prerequisite for meaningful nature conservation programmes. Without data on the habitat requirements, distribution and abundance of animals and plants we would not know whether particular species were common or in danger of extinction, nor would we know if various species occurred in nature reserves or national parks.

In Western Australia several different organisations and many individuals have contributed such information over the years but with little planning or coordination. In 1975 and 1976 the Environmental Protection Authority released two "Red Books" titled "Conservation Reserves for Western Australia". As well as recommending that various areas of land be reserved for conservation the EPA also asked that a large number of biological surveys be conducted to see if certain areas were suitable for reservation and, if so, to lay down boundaries. This led the Department of Fisheries and Wildlife to suggest the creation of a co-ordinating committee for biological survey work. The Biological Surveys Committee first met in 1977. It comprises representatives of the National Parks Authority of W.A., the W.A. Museum, the W.A. Herbarium, and the W.A. Wildlife Research Centre.

The Committee decided to co-ordinate two types of biological survey:

1. inventory surveys of particular areas especially those recommended for survey by the EPA, and
2. regional surveys aimed at providing information on plant and animal distributions, population fluctuations, habitat requirements and the effects on the environment of man's activities. These surveys can also be used to evaluate the existing conservation reserves system.

Since 1977 inventory surveys have been carried out on eight of the fifteen areas listed by the EPA, as well as other reserves such as the Cooloomia Nature Reserve (SWANS Vol. 10, No. 2).

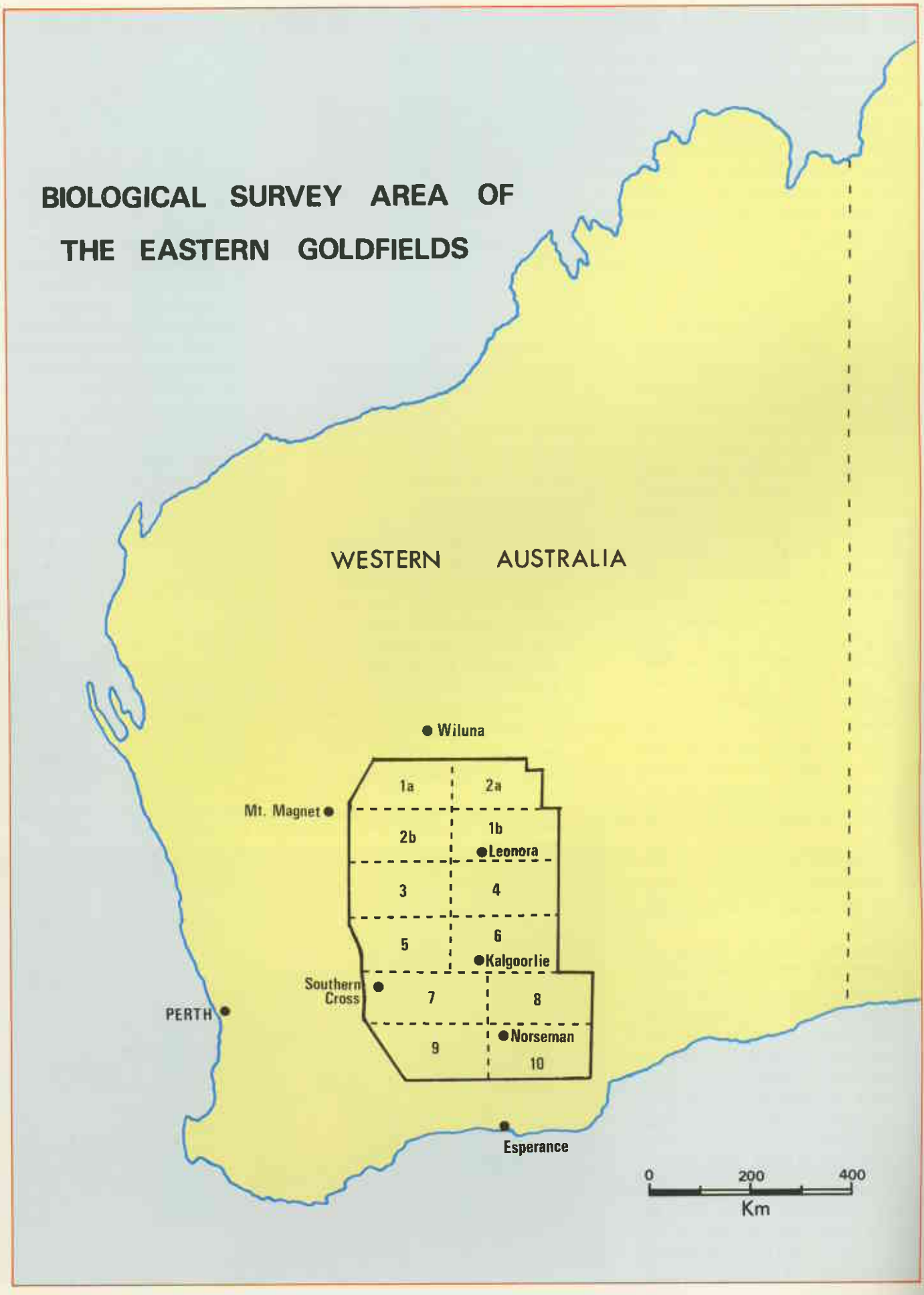
The Committee decided to base its regional surveys on the 12 "Systems" defined by the Conservation Through Reserves Committee in 1974. After considering each system in terms of existing knowledge and vulnerability to environmental change it decided there was an urgent need for a regional survey of CTRC System 11 — the Eastern Goldfields.

The Eastern Goldfields was chosen for two main reasons:

1. The great scientific interest in the "Coolgardie Botanical District" or "South West Interzone", which is an area to which many plant and some animal spcies are restricted, and to which the world-famous goldfields woodlands are largely restricted. No systematic collecting of plants or animals had been done previously but available data suggested that many species of plants which occur there have very restricted distribution.
2. The pressure to have further land in the southern part of the region opened up for agriculture. There was little information available on which to base proposals for nature reserves should areas be released for farming. In addition the CTRC report made it clear that the existing large conservation reserves in the region may not be sited in the best locations.

The area being surveyed closely follows that defined by CTRC but excludes a small area in the north around Wiluna. It is roughly rectangular and extends between 27°00'S and 33°00'S and 118°30'E and 123°45'E — an area roughly equal to that of the State of Victoria. Rainfall varies from 200 to 340mm. The Committee divided the area into 12 "cells" on the basis of the 1:250 000 map series. The two survey teams, one each from the W.A. Museum and the W.A. Wildlife Reseacrh Centre, each have responsibility for 6 cells, allocated so each team covers as wide a

▼ Desert Banded Snake *Rhynchoelaps b. bertholdi*. A small harmless burrowing snake from arid areas of Australia. (Photo — Copyright A.G. Wells)


BIOLOGICAL SURVEY AREA OF
THE EASTERN GOLDFIELDS
WESTERN AUSTRALIA
Wiluna
Mt. Magnet
Leonora
Kalgoorlie
Southern Cross
PERTH
Norseman
Esperance
1a
2a
2b
1b
3
4
5
6
7
8
9
10
0
200
400
Km

latitudinal and longitudinal range as possible. Two consulting botanists work with the teams with support from the W.A. Herbarium. National Parks Authority staff input increases effort in cells 7 and 9, the most complex part of the region, by documenting the fauna of three National Parks — Boorabbin, Frank Hann and Peak Charles. The vegetation of the eastern goldfields is dominated by two groups of plants — *Eucalyptus* (gums) and *Acacia* (wattles) — and the committee was fortunate to be offered assistance by two botanists who are specialists in the taxonomy of these genera — Mr M.I.H. Brooker of the Forest Research Institute in Canberra and Mr B.R. Maslin of the W.A. Herbarium.

The Biological Survey of the Eastern Goldfields commenced in 1977 and 1978 with work by the Wildlife Research Centre on a proposed nature reserve in Cell 10 east of Lake Dundas. This survey provided the experience necessary to plan the main survey which commenced in the spring of 1978 and which will finish early in 1982. Effort in each cell varies with the complexity of the area. The northern-most 4 cells, numbered 1a, 1b, 2a, and 2b, are less diverse and only one study area was selected in each cell. Other cells have two study areas excepting cell 7 which has 3 and cell 9 which has 4. Each study area is visited three times in different seasons. The siting of study areas depended on accessibility but where practicable these were sited on areas of maximum environmental variability so that all the major vegetational systems of an area can be sampled and existing nature reserves and national parks can be documented.

Biological survey teams normally visit the Eastern Goldfields on field trips of about two weeks consisting of two successive camps in different parts of a cell. Specialists in the team study mammals, birds, reptiles and amphibians. As well as recording the presence of a species, information is also collected on habitat requirements, seasonal abundance and breeding. Various techniques are

▲ Peak Charles National Park. The granite hill is surrounded by mallee country typical of areas in the south-west of the study area. (Photo A. Burbidge)

▼ Woodland on the Mt. Manning Range Nature Reserve. (Photo A. Burbidge)

▼ Species rich Kwongan (sand heath) vegetation in Frank Hann National Park. (Photo — A. Burbidge)

Goldfield Survey — Special Features

▲Salt lake margins have their own specialised flora and fauna. (Photo — A. Burbidge)

▲Pied Honeyeater *Certhionyx variegatus*. A resident of the Northern arid zone migrating south into the Goldfields during winter and spring. (Photo — Copyright A.G. Wells)

▼A Common Dunnart *Sminthopsis murina*. This animal differs from the dunnarts from the south-west of Western Australia, especially in having big ears, and may be a new species. (Photo — Copyright A.G. Wells)

▲A survey member inspects a Tree Martin nesting hollow to see if eggs are present. (Photo — A. Burbidge)

▼An undescribed subspecies of *Banksia sphaerocarpa* from near North Ironcap. This subspecies was discovered during the survey. (Photo — A. Burbidge)

▲*Dryandra arborea* — the Yilgarn Dryandra, restricted to a few stony hills north of Koolyanobbing. (Photo — A. Burbidge)

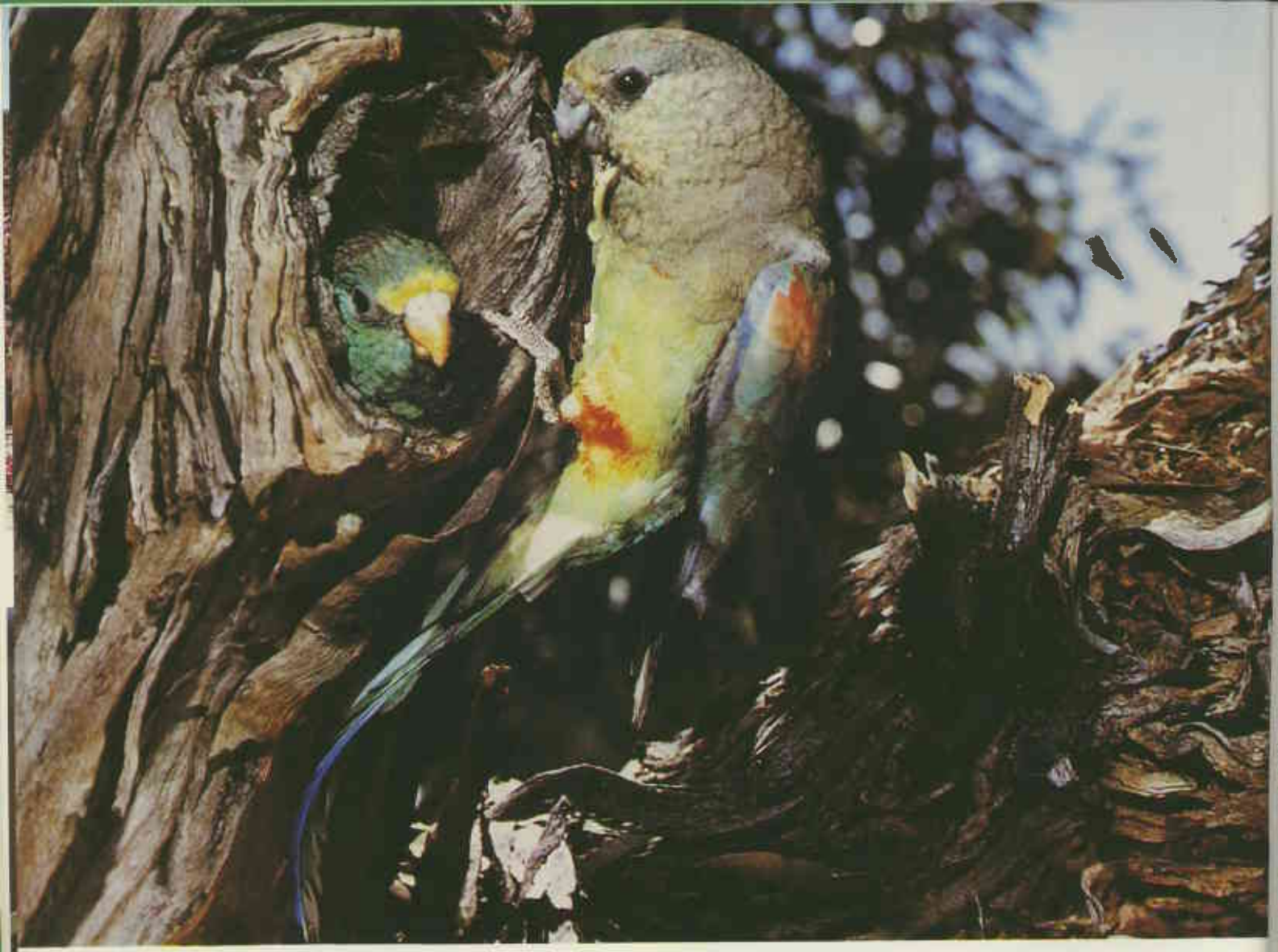
▲Hairy-footed Dunnart *Sminthopsis hirtipes*. A species from the sandy deserts also found in the Goldfields. (Photo — Copyright A.G. Wells)

▲A species of *Grevillea* growing on red sandplains in the northern part of the Eastern Goldfield. (Photo — A. Burbidge)

▲Common Scaly-foot *Pygopus lepidopodus*. A legless lizard with a wide distribution throughout Southern Australia. (Photo — Copyright A.G. Wells)

▼Mitchells hopping-mouse *Notomys mitchellii* is an animal that is found in the arid central areas of continental Australia. It is slightly larger than the common house mouse with a characteristic white or cream colour on its chest or throat. (Photo — Copyright A.G. Wells)

▼Wanjarri Nature Reserve. Red sandplain and dune country typical of the Great Victoria Desert. (Photo — A. Burbidge)



▲ Mulga Parrot *Platycercus varius*. Female feeding young in nest hole in *Eucalyptus*. (Photo — Copyright A.G. Wells)

employed for capturing and recording animals, including trapping, observation, digging out burrows, searching for nests, and so on.

The responsibility of the two botanists has been divided differently, one being assignment to the south-western cells (5, 7, 9 and 10) and the other to the more inland ones (1, 2, 3, 4, 6 and 8). They visit the region with the faunal survey teams and at other times when plants are in flower.

After completion of the field work the results will be prepared for publication. Publications will be at three levels:

1. Reports on the vegetation and vertebrate fauna of each cell. When a visit incorporates an existing large nature reserve or national park a report will be prepared on that area, including a vegetation map.
2. Syntheses of the total data for plants and for each group of animals and a separate evaluation of the conservation reserve system.
3. A summary of results for publication in an international journal.

The biological survey is now about three quarters completed and much interesting information has already been collected. When completed it will be the first time in Western Australia that nature conservation will be able to proceed in the light of detailed information on a region. It will also allow future Western Australians to measure any changes which might result from development.