NATIONAL PARKS AND NATURE RESERVES IN WESTERN AUSTRALIA

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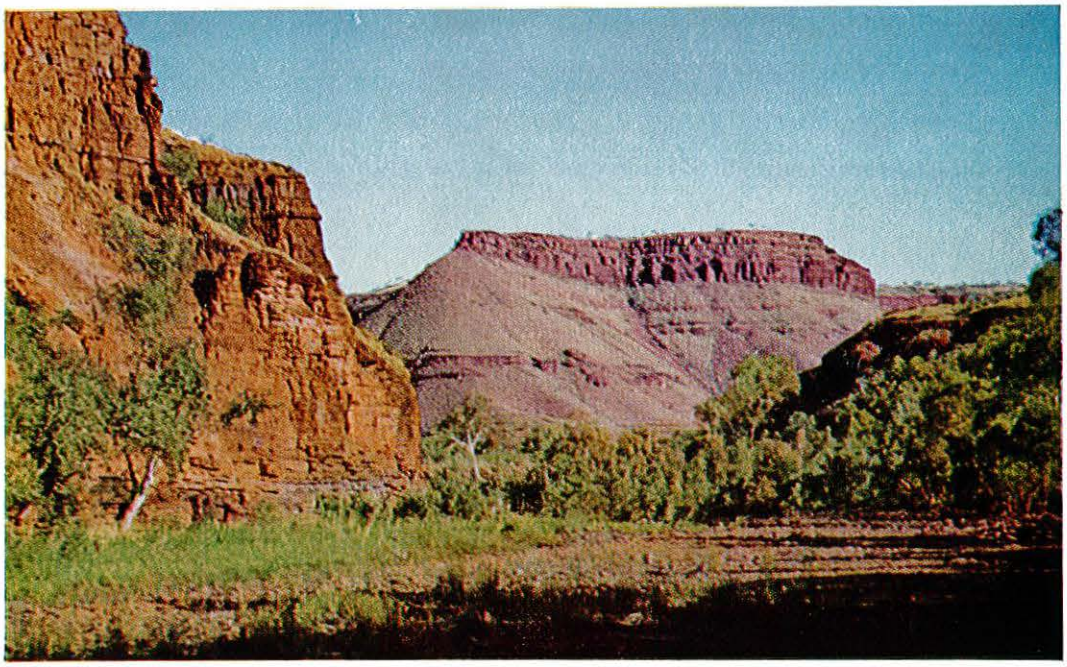
WESTERN AUSTRALIA

by

THE WESTERN AUSTRALIAN SUB-COMMITTEE
of
THE AUSTRALIAN ACADEMY OF SCIENCE COMMITTEE
on
NATIONAL PARKS



A Scene in the Rugged Hamersley Ranges

Edited by

The Standing Committee on Conservation of the

Royal Society of Western Australia

Published by

The Australian Academy of Science

and

The National Parks Board

of

Western Australia

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CHAPTER 1

Introduction

There is wide recognition within Australia that our scenery and wildlife are unique and deserve preservation. However, in years to come, it is clear that much of the Continent will be radically altered by pastoral and agricultural interests and in the course of this many communities of natural animals and plants will become extinct. Even the scene will change because roads, towns, and railways will be built and crops planted.

In the future, patches of original bush will be things to remark upon and, when that time comes, both the scientist seeking information on the effects of the activities of man and his animals and crops, and the ordinary family seeking recreation will need these natural areas more than they do today. In addition, some of them will become important economic assets to adjacent human populations in the form of tourist-attracting National Parks.

For these reasons it is imperative that no time should be lost in planning and setting up a comprehensive system of reserves for our Continent, while we can, so that a representative selection of all different kinds of Australian fauna and flora in their natural settings shall be preserved for all time.

The Australian Academy of Science had these things in mind when it set up its Committee on National Parks and Nature Reserves.

At the outset it was recognized by the Academy Committee that no really useful work could be done until the position in each of the States and Territories of the Commonwealth was understood. Therefore local sub-committees were set up by invitation from Sir John Eccles the President of the Academy.

The Western Australian Sub-committee was asked these questions:

What has been done,
What is being done,
What should be done,

in Western Australia to have land set aside for use as National Parks and Nature Reserves.

This report attempts to answer these and contains the following chapters:

A historical survey of the actions of individuals, societies, and government bodies in setting aside Nature Reserves in Western Australia.

A list of lands at present reserved in Western Australia.

An interpretation of the legal position as it stands in relation to the security of land in reserves today.

Descriptions of land areas which the Sub-committee considers would form a system of National Parks and Nature Reserves for Western Australia. These are chosen as representatives of all major communities of natural wildlife and scenery types in Western Australia and include both land which is at present reserved and that which is uncommitted.

A selection of areas of geological importance which require preservation.

A statement of the position regarding archaeological and anthropological sites.

Brief statement of the need for the preservation of some historical buildings.

The Western Australian Sub-committee has not

attempted to suggest procedure which might be followed by a State Government or State Government Departments if its opinions are acceptable. As an informed group of men comprising administrators of land, professional foresters, zoologists, botanists, geologists, and fauna authorities, it has simply stated what it believes to be desirable for the benefit of the people of Western Australia, those of Australia, and scientists and interested people everywhere.

If these opinions are judged to be worth following, it is hoped that the State Government will appoint further committees to make recommendations on implementation.

The Sub-committee has not attempted to say how reserves or national parks should be managed. This was not its task; nevertheless, a word ought to be said about the general problem of the need for management of reserves. Bitter experience has taught national parks and conservation authorities in all parts of the world that nature reserves and national parks will not manage themselves. They are artificial things, islands of fauna and flora which are mere fractions of the former distribution of the animals and plants which go to make up their populations. As such they are subject to the kinds of fluctuations and pressures which island faunas and floras experience and which result in the characteristic forms taken by insular communities. If they are to be maintained as representatives of continental areas, they must be managed, or they will not stay that way.

National parks are also subject to the alien incursions and demands of mankind. Thus, management must be not only scientifically competent to exert biological control but must also be capable of controlling the comings and goings of the public so that the demands of humanity are satisfied <u>to a degree compatible with the maintenance of the parks for their assigned purpose</u>. At present, there is no conservation authority in Western Australia capable of providing such multiple management. However, the State Government has a number of agencies and departments which employ able and trained men who, by combination, could begin to provide such a service.

In Western Australia reserves are controlled by a multitude of authorities, some well informed, others less so. In the field of biological conservation, there is little doubt that the most effective of these is the

Fauna Protection Advisory Committee which, as a corporate body, has vested in it a number of the most important nature reserves in the State. However, this Committee and the Chief Warden of Fauna have little money and are in no position to control a system of national parks. Similarly, the National Parks Board, cannot, as it is equipped and constituted, manage and control the extensive system of reserves proposed here.

What is needed, then, is a newly conceived National Parks Authority. Such an Authority would have to possess adequate finance, be biologically expert, and have the administrative power and personnel to manage these parks and reserves.

Many of the areas of land mentioned in this report are a priceless national scientific asset and are a potential tourist attraction but, without considerable finance, the facilities cannot be provided to ensure both their biological security and their development. Security for the flora and fauna of the reserves, and intelligent development for public use must go hand in hand. The bush gains its security through the voices of its public admirers, while it only retains its natural character through proper management.

It seems likely that a National Parks Authority cannot be achieved with only local finance. If Australian Science judges that these land areas in Western Australia are important enough to set aside as part of a national scheme, we believe that an approach should be made by the Academy of Science for Commonwealth finance for a National Park Service.

As Western Australians, however, we must remember that the land in Western Australia is controlled by the State and that, for the control and finance of parks and nature reserves to be handed to a Commonwealth Authority, initiation would have to come from within.

Whatever the solution of this problem, it is clearly one which requires to be discussed frankly by all concerned with it.

We cannot pretend that this report is the last word on this vitally important problem. We have only superficial acquaintance with many of the problems discussed in it, but we hope that, through it, a proper and lasting system of National Parks and Nature Reserves will

be set up to preserve, for all time, our wonderful national heritage.

The Sub-committee which compiled this report for the Australian Academy of Science consisted of

Dr. W. D. L. Ride	Chairman and Convenor Director of the Western Australian Museum and member of the Academy of Science Committee on National Parks and Nature Reserves
Mr. B. E. Balme	Senior Lecturer in Geology University of Western Australia
Mr. G. E. Brockway	Superintendent (Research Aboriculture and Interior) Forests Department
Mr. A. T. Cleave	Deputy Surveyor General Department of Lands and Surveys
Mr. A. J. Fraser	Chief Warden of Fauna
Mr. C. A. Gardner	formerly Western Australian Government Botanist
Mr. A. C. Harris	Conservator of Forests
Miss M. Lukis	State Archivist Library Board of Western Australia
Dr. A. R. Main	Reader in Zoology University of Western Australia
Dr. P. E. Playford	Supervising Geologist Geological Survey of Western Australia
Mr. R. D. Royce	Botanist and Curator of the State Herbarium
Dr. A. R. Wilson	Reader in Geology University of Western Australia

<u>In addition</u>

Mr. H. B. Shugg	Secretary of the Fauna Board attended all meetings and provided data.
Miss H. Williams	Research Assistant to Dr. Ride was Secretary to the Sub-committee and carried out most of the archival research.

This Edition

The report of the Western Australian Sub-committee of the Australian Academy of Science Committee on National Parks and Nature Reserves was issued in its original form in 1962 in a cyclostyled edition of 30 copies. Most of these copies went to the members of the Academy Committees and Sub-committees and to State Government Departments and to officers of the Academy.

When it became clear that there was a demand for a public edition of the report, the Australian Academy of Science and the National Parks Board of Western Australia agreed to publish it jointly and requested the Royal Society of Western Australia to edit it through its Standing Committee on Conservation. This was done by an editorial committee comprising:

Mr. C.F.H. Jenkins — President of the Royal Society of Western Australia, Chairman;

Mr. J.F. Morgan

Dr. P.E. Playford

Dr. W.D.L. Ride

Mr. R.D. Royce

The report presented here in this new form contains no altered statements of opinion. It has been rearranged to make it more suitable for general reading, some references to original sources of information have been deleted and the sections on old buildings and aboriginal sites have been shortened. Mr. G.A. Kennedy, who assisted the Sub-committee to write the original section on the interpretation of Acts relating to reserves, has once more assisted by bringing that section up to date to the end of 1963.

Students who wish to consult the early edition for original references, sources, etc. will find copies available in the Library of the Australian Academy of Science, the J.S. Battye Library of Western Australian History and the Library of the Western Australian Museum. Any new statements here (not included in the original) which result from further research, are fully documented in this edition.

Acknowledgments

The Sub-committee wishes to acknowledge the very considerable assistance which it has received from all Western Australian Societies concerned with problems which it has considered. Acknowledgment of their contributions occurs often in the text of the report. Further, the Sub-committee must express its great indebtedness to the staffs of the Government Departments and instrumentalities which, without exception, placed their files and expert knowledge at the services of the Sub-committee. However, Societies and Departments are made up of individuals and it is important to record that very practical help was given to us by the following:

Mr. H. E. Bancroft, Managing Secretary, National Parks Board of W.A.; Staff of the J. S. Battye Library of Western Australian History; Mr. I. T. Birtwistle, President, Royal Western Australian Historical Society; Mrs. L. M. Callow, State Secretary, Tree Society; Mr. F. Carlton Smith, Under Secretary for Lands, Lands Department; Mr. S. Chapman, Roads and Reserves, Lands Department; Mr. R. Connelly, Technical Officer, Geological Survey of Western Australia; Dr. J. E. Glover, Senior Lecturer in Geology, University of Western Australia, Professor B. J. Grieve, Professor of Botany, University of Western Australia; Mr. C. G. Hamilton; Mr. A. R. Kelly, Secretary, Pemberton Tourist Association; Professor J. R. McMillan, Hon. General Secretary, A.N.Z.A.A.S.; Miss S. J. Meagher, Department of Anthropology, Western Australian Museum; Mr. A. L. Millen, Manager, Western Australian Government Tourist Bureau; Mr. J. M. Ryan, Superintendent of Mapping, Lands Department; Dr. D. L. Serventy, Principal Research Officer, C.S.I.R.O. Wildlife Survey Section; Miss O. Seymour, Secretary, Gould League of Bird Lovers; Mr. F. A. Sharr, State Librarian, Library Board of Western Australia; Mr. H. B. Shugg, Secretary, Fauna Protection Advisory Committee; Mr. G. G. Smith, Lecturer in Botany, University of Western Australia; Mr. P. S. Smythe, Clerk in Charge, Roads and Reserves, Lands Department; Mr. J. A. Seeber, Clerk in Charge of Records, Lands Department; Mr. J. R. Vollprecht, Climatologist, Weather Bureau; Mrs. G. Ward, Rottnest Board of Control; Mr. J. E. Watson, Secretary and Superintendent of King's Park Board; Mr. B. R. Wilson, Graduate Assistant, Zoology Department, University of Western Australia.

Finally, the Sub-committee would acknowledge the very considerable assistance which it has received from Mr. G. A. Kennedy, B.A., LL.B. (Western Australia), B.C.L. (Oxon.), who gave much time and placed his considerable professional skill at the service of the Sub-committee in interpreting current State Legislation relating to the setting aside, protection against alienation, and management of nature reserves in Western Australia.

CHAPTER 2

History of the Reserve Movement in Western Australia 1829—1961

I. INTRODUCTION AND EARLY LEGISLATION

The first European settlement in Western Australia was established in the area around King George's Sound (now Albany) in 1826. Three years later, in 1829, the Swan River Colony was founded under Captain James Stirling. In the "Royal instructions to Captain Stirling, Governor and Commander in Chief in Western Australia, 5th March 1831", H.M. William IV directed him:

> "...to require and authorise the said Surveyor General further to report to you what particular lands it may be proper to reserve in each County Hundred and Parish so to be surveyed by him as aforesaid for public roads ... or as places to be set apart for recreation and amusement of the inhabitants of any town or village or for promoting the health of the inhabitants..."

For more than half a century the colonists were surrounded by plentiful virgin country, and until 1872 it was not found necessary to set aside areas of land for what we would today call National Parks and Nature Reserves. The first reserves were set up under the Land Regulations for the Colony of Western Australia of 1872 and 1887. By modern standards these reserves were far from secure; the Governor

could change their purpose, and could place them under the control of a person or local authority.

The Parks and Reserves Act of 1895 empowered the Governor to appoint Boards to control and manage parks and reserves which could be created under the Regulations of 1887. Four reserves had already been set up at that time. Boards set up under the 1895 Act had general powers of control over the parks and reserves in their care, and could carry out constructional work to increase their amenities, and could grant licences for the depasturing of animals and the removal of natural products.

During the next few years two major Acts were proclaimed which had considerable effect upon the use of land as National Parks and Nature Reserves. These were the Land Act, 1898 and the Permanent Reserves Act, 1899. The Land Act consolidated previous land regulations and specifically provided for the setting aside of lands as reserves for the protection of indigenous flora and fauna. Such reserves could be placed under a Board of Control, but the Governor could cancel, amend or change the specified purposes for which the reserves had been made. The Permanent Reserves Act made provision for the security of reserves by creating three classes of reserves, each of which had a different degree of security against alienation through official or other action. Briefly, these classes were:

1. Class A.

   Reserves created Class A could not be alienated for other purposes except by an act of Parliament.

2. Class B.

   Reserves created Class B could be alienated for other purposes by proclamation in the Western Australian Government Gazette. Reasons for the cancellation of these reserves had to be given by the Minister for Lands to both Houses of Parliament.

3. Class C.

   All other reserves set aside under Section 39(7) were Class C. These were easily alienated and they could be cancelled, or have their purposes

changed, by the Governor after proclamation of the action in the Western Australian Government Gazette.

The provisions for parks and reserves in the Land Regulations (and subsequent Acts) appear to have arisen because of the growing awareness of the urgent need for some land, as yet untouched, to be set aside in perpetuity for the preservation of the indigenous flora and fauna and the natural beauty of the countryside, as well as to provide future generations with examples of the country as it was at the time of first settlement. This need was emphasized by the voices of a number of newly formed societies, both inside and outside Western Australia, which both reflected and affected local opinion in this respect. In particular, it is important to recognize that among the Western Australian members of these societies were some of the Colony's most prominent citizens including Sir John Forrest (the Premier), Sir Francis Robinson (His Excellency the Governor), and Mr. Bernard H. Woodward (Director of the Western Australian Museum).

Before this time, preservation of the fauna in Western Australia had not been considered in relation to the need for the correlated preservation of its environment. Thus there were a number of earlier Game Acts and regulations which protected individual animals, yet took no account of their altering environments. The first of these was the Kangaroo Ordinance of 1853 which was introduced to ensure that the economic and sporting needs of the settlers would continue to be met, and to prevent the wholesale killing of kangaroos which deprived the Aborigines of their usual means of support. The Ordinance stipulated that licences had to be obtained to shoot kangaroos, though landowners or their servants could still kill kangaroos on their own properties. Aborigines living in their natural state were also exempt. The Ordinance was repealed in 1878.

The Game Act of 1874 was proclaimed with the intention of protecting introduced game animals and those native animals which were hunted. The Act listed the introduced animals which were to be protected and a number of native animals which were to be protected during the "breeding season". Eggs belonging to the species listed were also protected. The Act was amended in 1876 and 1878 to enlarge the list of native animals and to allow alterat-

ion of the dates of the "breeding season" of different animals. The latter amendment became known as the Game Act, 1878.

The Game Act of 1892 resembled the 1878 Act, the main difference being that regulations were added whereby the Governor could from time to time declare the following by proclamation in the Government Gazette:

(a) Closed seasons for any particular native game, either generally throughout the Colony or in any one or more portions thereof.

(b) Reserves for native game.

(c) That any particular animal indigenous to Western Australia shall at all times be strictly preserved either generally throughout the Colony or in any one or more portions thereof. Any person who was found to have destroyed any bird or animal protected under this Act could be fined.

The list of indigenous animals protected under this Act was considerably extended in comparison with those of previous Acts, and it was at this time that non-game animals began to appear on the Schedule protecting native animals.

A large number of native game reserves were declared throughout the State in following years. These were declared over private property, Crown Land, and lands under the control of various government departments.

In 1900 the Game Act was amended primarily to prevent the wilful destruction on the economically important kangaroo. Apparently the provisions of previous Acts in this regard had proved ineffective, and under the amended Act the Governor was given the power to appoint inspectors to enforce the provisions of the Act. Under later amendments in 1907 and 1911 kangaroos could be taken for food during the closed season or on game reserves (provided licences were first obtained) and further measures to tighten controls were passed.

The Game Act of 1912 consolidated existing Game

laws with the addition of amendments allowing the Governor to appoint persons as Guardians having the necessary powers to enforce provisions of the Act and regulations. The Minister was granted authority to allow persons to take game for scientific or acclimatization purposes and it was provided that no living game could be exported from the State without the written consent of the Minister. The Act was slightly amended to control the export of skins more tightly, and it became known as the Game Act, 1912-13. It remained effective until 1950 when the Native Fauna Protection Act was proclaimed, and this completed the transition from legislation designed to preserve animals and birds for sporting purposes to the modern practice of giving protection to all terrestrial vertebrates unless they are harmful species.

II. THE PART PLAYED BY SOCIETIES AND PROMINENT INDIVIDUALS IN THE CONSERVATION AND RESERVE MOVEMENT

The Western Australian Natural History Society.

During the winter of 1891 a number of influential citizens founded the first scientific society in Western Australia. This Society, the Western Australian Natural History Society, under the presidency of Sir John Forrest (later Lord Forrest) flourished for a while. "Although it was never endowed with sufficient funds to publish a journal, its influence was the means of securing the first permanent native flora and fauna reserve of 160,000 acres between Pinjarra, North Dandalup and the Bannister" (Anon., 1913).

The Society did not continue after 1895.

Australasian Association for the Advancement of Science.

At this period the newly formed Australasian Association for the Advancement of Science was also influencing thought in Western Australia. Woodward (1907) states that the Association was actually responsible for the first move towards conservation of land dedicated to the preservation of natural flora and fauna in Western Australia.

At the Adelaide meeting of the Australasian Association for the Advancement of Science in 1893 the Committee

set up to make recommendations on the protection of fauna suggested:

1. That closed reserves, controlled by local honorary trustees and supported by Government grants, should be proclaimed. In Western Australia, Rottnest Island (for the protection of the mallee hen), and the Houtman's Abrolhos Group should become closed reserves supported by a Government Grant.

2. That the existing Game laws should be strictly enforced.

3. That in all Game Acts provision should be made for the proclamation of districts comprising both Crown Land and private property where a particular species may be protected for an indefinite period.

4. That special legislation should be introduced in all colonies to provide for the protection of animals of economic value or particular biological interest.

5. That a standing committee of local naturalists should be appointed in each colony to deal with the protection of the native fauna.

6. That copies of these resolutions should be sent to the various Australasian Governments with the request that they give their assistance in carrying them into effect; also to all colonial scientific societies with the request for co-operation and support.

7. That local committees be appointed to prepare systematic lists of the vernacular names of the Australian birds.

On the 17th July 1893, the secretary of the Committee (Mr. A. S. Robin) wrote to the Premier of Western Australia, Sir John Forrest, giving him details of the work of the Committee on the protection of native fauna, and requesting the co-operation of someone in Western Australia to assist the Committee in this matter. He also requested a brief historical sketch of the work done to date in the Colony with regard to conservation. Sir John replied to Mr. Robin on 11th August 1893 suggesting that Mr. Bernard H. Woodward, Director of the Western Australian Museum, was the only person he could recommend to carry out this work. In reply to Sir John Forrest's invitation to assist the Austra-

lasian Association for the Advancement of Science, Mr. Woodward wrote on the 26th August 1893:

> "I shall be pleased to do anything I can to help in this matter. His Excellency the Governor was pleased, a few months ago, to forward to you a letter from me asking for a reservation for the protection and preservation of the indigenous flora and fauna but as yet I have received no reply. The locality I mentioned first, I consider eminently suitable, being so near the metropolis and yet land absolutely valueless for agricultural, pastoral, viticultural and ... purposes.
>
> Rottnest ... I do not consider suitable, although I hope before many years have elapsed to see a biological station for observation of marine flora and fauna, the Government granting a site, and the Natural History Society and private citizens giving donations to its upkeep. As far as I am aware the only protection afforded to the fauna consists in (Order in Council) protecting the birds of the 'Swan' during the breeding season (not strictly enforced) ... none of the marsupials have any protection at all."

A search of the Western Australian Museum and Lands Department files for that period has failed to reveal any further correspondence on this matter. The Hon. General Secretary of the Australian and New Zealand Association for the Advancement of Science in 1961, Professor J. R. A. MacMillan said (personal communication) that the early files of the Australasian Association for the Advancement of Science are no longer available. Whether this Committee continued to function, or what other work it actually achieved, we are now not able to discover. However, if it did nothing else, it awakened the interest of three of Western Australia's most eminent men.

<u>The part played by Sir John Forrest, Sir William Robinson, Mr. B. H. Woodward and Baron F. von Mueller.</u>

Mr. Woodward was perhaps the first scientist in Western Australia to advocate creating permanent flora and fauna reserves and he attributed (Woodward, 1907) the growing interest of the public of Western Australia in these matters to the work of the Australasian Association for the

Advancement of Science which may well have awakened his own interest.

In addition to Sir John Forrest and Mr. Woodward, His Excellency the Governor of Western Australia, Sir William Cleaver Francis Robinson, G.C.M.G., was active in the reserve movement and was patron of the Western Australian Natural History Society. It was largely due to the political influence of Forrest and the Governor that the first large reserve between Pinjarra, North Dandalup and the Bannister River was created.

The records of this period clearly show that the Victorian botanist, Baron Ferdinand von Mueller, K.C.M.G., F.R.S., was also closely involved in the reserve movement in Western Australia. Woodward (1907) stated that von Mueller and Sir William Robinson had considerable correspondence on the matter of flora and fauna reserves. A search of the records of the Colonial Secretary's Office (which preceded the Premier's Department) and of the Government House files for the years 1890-1902 has failed to reveal this, but it is clear that many of the letters for that period have been destroyed. However, we do know Baron von Mueller's ideas on conservation of native flora and fauna because these are set out in his inaugural speech to the Australasian Association for the Advancement of Science meeting in 1890. In an eloquent plea for the setting aside of areas of natural vegetation, he said:

> "Choice areas, and not necessarily very extensive, should be reserved in every great country for some maintenance of the original vegetation, and therewith for the preservation of animal life concomitant to peculiar plants. Where the endemic riches are greatest, there also the danger is more imminent of these being swept out of existence, unless timely measures are adopted for the preservation of some sequestered spots, to which rural occupation should never be allowed to have any access with their disturbing influence on primeval harmonies. Such spots should be proclaimed for all time the people's unalienable property, and every inhabitant or visitor of the locality should consider himself the co-preserver of such areas, so as to aid in preventing accidental invasion or casual ignition of intentional spoliation."

In the same address he mentioned the great economic importance of forest and vegetation cover in the preservation of

correct water relations.

Thus, the two professional workers in this field (von Mueller and Woodward) received the interest and support of two of Western Australia's most prominent citizens. It was perhaps a nearly ideal start for the protection of fauna and flora in the State, but unfortunately they were unable to do other than make a promising beginning.

The Mueller Botanical Society (1897-1904).

In 1897 the Mueller Botanical Society was founded under the presidency of Mr. M. J. Bickford, F.L.S., and this Society "grew out of the ashes of the Western Australian Natural History Society" which had become moribund by 1895 (Anon., 1913). Its first patron was the Premier, Sir John Forrest. At the third Annual Meeting of the Society held on the 17th August 1900, Sir John addressed the meeting. The report of his address (Mueller Botanical Society of W.A. Jnl. of Proceedings 1 : No. 7 : 9) reads

> "Anything he (Sir John Forrest) could do, either personally or as head of the Government, to assist the Mueller Botanical Society, or similar societies which had the same object in view, the preservation of natural flora of their Colony, he would do gladly ...". Also: "That the Government would be glad to assist in preventing the destruction of flowers, and he understood that the Law now provided for the protection of plants. It remained for the Society to point out what plants or trees it required to be protected, and he could assure them of the assistance of the Government."

The records of the Mueller Botanical Society are no longer available and it is not possible to find out whether it actually did take advantage of the Premier's invitation. The legislation which Sir John mentioned in his address to the Society was the Land Act, 1898.

Western Australian Natural History Society (1903-1909).

In 1903 the Mueller Botanical Society resolved to widen its sphere of interest and from that year it became known as the Western Australian Natural History Society (Dakin, 1913). Later (1909) it became known as the Western Australian Natural History and Science Society.

The reserve between North Dandalup, Pinjarra and

the Bannister River which had been advocated by the Western Australian Natural History Society of 1891-95 had become, since its creation in 1894, a bone of contention in governmental circles. It was thought by some to be valuable for timber and farming purposes and there was constant pressure put upon the Government for its alienation, so that it could be thrown open for selection, etc. Woodward (1907) stimulated the Society to petition His Excellency the Governor (Sir Frederick Bedford) on the 9th August 1907, requesting that the reserve be vested in Trustees as a National Park. The petition was ineffective and on 7th April 1911 the purpose of the reserve was changed to "Timber - Government Requirements". It is now State Forest No. 14.

The Western Australian Natural History Society was approached by the Linnean Society of New South Wales in 1908 and the following resolution was passed:

> "That the Secretary of the Linnean Society of New South Wales be informed that this Society welcomes most cordially and desires to give its utmost support to any measures calculated to protect the Native Fauna and Flora of Australia and views with much hope the efforts now being made to induce Federal and State Legislatures to effect the same, and desires that the extreme urgency of the matter and its importance be most fully represented."

But there is no record that any action was taken in Western Australia.

At the same time as the abortive attempt by the Linnean Society of New South Wales to organize Australia-wide action, the Australian Ornithological Union arranged a Conference on bird protection. The Conference of State Government representatives was held in Melbourne in November 1908. Sir John Forrest was chosen to represent Western Australia at this meeting on the recommendation of the Western Australian Natural History Society.

The Conference agreed that proper protection of the useful birds of the Commonwealth was of far-reaching importance. However, when the possibility of placing the matter of conservation of birds in Commonwealth hands was discussed, it was decided (Emu : 8 : 1-3) on the motion of Mr. Macheen (representing Victoria) that:

> "Owing to this Conference being unable to prepare a complete "Model Bird Protection Bill" through the impossibility of dictating how each State should legislate, in detail, and owing to the constitutional relations between the Commonwealth and the States, no such Bill, as was intended, shall be prepared; but instead the series of recommendations resolved upon should be submitted to each State for favourable consideration for the protection of birds."

The recommendation which is relevant to this history was:

> "That for the conservation of birds each State be recommended to establish absolutely protected reserves on Crown Lands, preferably near towns, whereon no shooting of protected birds is to be permitted throughout the whole of each year...".

In March 1911 Mr. J. G. Hay delivered a paper to the Western Australian Natural History and Science Society entitled "Bird Day - A Plea for the Protection of Birds" in which he is reported to have said:

> "Can nothing be done to stop the rapid decimation of the Australian fauna? The legislature can do something by passing a Native Fauna Protection Bill, and the Lands Department could do more by creating small reserves in all the agricultural areas throughout the South-West Division, not a few large ones but, say, one-tenth of the area where timber and scrub existed, dotted here and there throughout, and in close proximity to the whole. These would form bird sanctuaries...".

Hay also suggested that the Gould League of Bird Lovers should be started in Western Australia with the co-operation of the Education Department (Anon., 1911).

The Western Australian Natural History and Science Society, acting upon Mr. Hay's suggestion, set up a sub-committee to form a branch of the Gould League in Western Australia. However, even though the sub-committee unanimously decided to go ahead with the scheme (minutes of Western Australian Natural History and Science Society Sub-committee, 20th March 1911) they were unable to stimulate sufficient interest, and the Gould League was not formed in Western Australia at this stage. It did not be-

come established until 1939.

The Royal Society of Western Australia.

In 1914 the Western Australian Natural History and Science Society became the Royal Society of Western Australia. In 1926 the Society set up a Committee on the preservation of the Flora and Fauna Reserves. It comprised Mr. A. Gibb Maitland (Government Geologist and President of the Society), and Messrs. W. M. Carne (Department of Agriculture), L. Glauert (Curator of the Western Australian Museum), W. Catton Grasby (West Australian Newspapers) and the Secretary of the Natural Science Section of the Society. Several meetings were held; the main intention was to compile information relating to the names, boundaries, areas, descriptions and purposes of dedication of reserves in Western Australia. (Report of the Committee on the Preservation of Flora and Fauna Reserves in J. roy. Soc. W. Aust. (1926-27) 13 : xiv). The intention does not appear to have been carried out.

Reporting on its activities in the following year the Committee stated that it "has continued the work assigned to it though no matter of moment relating to the flora and fauna reserves of the State has called for its active intervention during the currency of the Society's year". (Report of the Committee on the Preservation of Flora and Fauna Reserves in J. roy. Soc. W. Aust. (1927-28) 14 : xvi). Mr. Gibb Maitland, the Committee's convenor, recommended at the Annual General Meeting of the Society for that year the reappointment of the Committee as a Standing Committee "... for its activities may be regarded as of a permanent nature". The Committee continued to exist although no further reports appear in the Society's journal until 1933 when a reference is made to the work of the Committee in the annual report of the Council for that year. "The Flora and Fauna Committee which is represented on the State Advisory Committee appointed by the Hon. Minister for Customs by its convenor has not met during the year although the interests of our fauna have been very carefully watched" (J. roy. Soc. W. Aust. (1932-33) 19 : vii). No further reports were issued by the Committee but the Royal Society Council has continued to take very active interest in all aspects of conservation right up to the present time.

The Western Australian Naturalists' Club.

In 1924 the Western Australian Naturalists' Club was founded under the presidency of Mr. C. G. Hamilton. This Club over the years has contributed greatly to the conservation movement in Western Australia. Its first Secretary, Dr. D. L. Serventy, has remained active in the Club until the present day and has been one of the prime movers in fighting for protection of native plants and animals in Western Australia over the last thirty years. Dr. Serventy has published a number of papers and articles in Western Australia dealing with conservation and through this medium has done much to awaken public interest (see list in references). He has served on numerous committees which have done much to further conservation in Western Australia.

Perhaps the reason why the Naturalists' Club has contributed so much to the movement is that among its leading members were professional zoologists and botanists who gave their knowledge freely and this was put to good use by the Club when it formulated its policy on conservation in 1949. From 1924 to 1949 the Club's major contributions to the preservation of the native flora and fauna usually consisted of approaches to government officials, objecting to the alienation of reserved land, seeking governmental control over the wilful destruction of animals on reserves, or the destruction of habitats. No definite overall policy was formulated during this period.

In November 1949 the Naturalists' Club set up a Committee on Fauna and Flora Protection. This Committee comprised Dr. A. R. Main (convenor and President of the Club at the time), Dr. D. L. Serventy, Mr. V. N. Serventy, Mr. C. B. Palmer, Mr. A. J. Fraser, Mr. W. H. Butler, Major H. M. Whittell, and Mr. C. A. Gardner. (Mr. A. J. Fraser, Dr. D. L. Serventy and Major H. M. Whittell were already members of the official Fauna Advisory Committee).

From the records and files of the Club it would appear that this Committee was set up at the suggestion of Major Whittell. In a letter to the Naturalists' Club dated 1st September 1947 he said, "it appears to me that the Club is the organization which should advocate to have National Parks in Western Australia placed on a satisfactory footing". In 1949 the Committee decided that Western Australia needed:

1. A Central Board or Commission comprising the heads of certain government departments, the Government Botanist, a government officer concerned with zoological matters and two representatives of natural history societies in Western Australia.

2. A government department to be the new working department of the Board.

3. A zoning system within reserves so that small portions of reserves should be developed for tourist purposes and the remainder should remain untouched.

4. That undeveloped areas should be reserved essentially as such.

On the 4th August 1950 the Western Australian Naturalists' Club wrote to the Hon. Minister for Lands saying, among other things, that the Club:

"(1) expresses its concern at the contraction, as a result of closer settlement, of the habitats of native fauna and flora, and in the diminution in the numbers of native fauna.

(2) expresses the opinion that before it is too late, the Government should set aside areas as sanctuaries (of differing categories) for native flora and fauna and that a Committee consisting of one representative each from the Royal Society of Western Australia, the Royal Australasian Ornithologists' Union (W.A. Branch), and the Western Australian Naturalists' Club, together with the heads of public departments, charged with the protection of native flora and fauna, should be set up by the Government to select appropriate areas;

(3) expresses to the Government its satisfaction at the decision to establish a National Parks Trust to control all reserves and sanctuaries; and

(4) appoints a delegation to convey these views personally to the Hon. the Premier."

The Surveyor General, Mr. W. V. Fyfe, replied with the following letter on 14th August 1950:

"I have been directed by the Hon. Minister for Lands to acknowledge receipt of your communication of the 4th instant, and to advise you as follows:

The Department's policy has always been to set aside reserves wherever possible for the protection of the flora and fauna, and although a large area of land has been alienated in this State, there are still many reserves for the protection of flora and fauna. This of course includes forest country. The Department is constantly receiving requests for the alienation of reserves and the reason usually advanced is that the reserves harbour vermin. The applicants fail to appreciate the fact — in fact, possibly do not want to do so — that the reserves are perhaps the only shelter available to birdlife for miles around.

The Government Botanist has recently requested the Department to set apart large areas in various parts of the State as flora reserves. His request is being considered.

The Minister has asked me to thank your Club for its interest in this matter and to state that he is willing to favourably consider any recommendations made by the Club."

At this time (as at the present day) flora and fauna reserves and National Parks not actually vested in some other authority were under the direct control of the Minister for Lands. Animals protected under the Game Act, 1912-13 were under the control of the Hon. Minister for Fisheries. Plants protected under the Native Flora Protection Act were under the control of the Hon. Minister for Forests. The security of the reserves thus depended upon the attitude of the Minister for Lands, although there was close co-operation between the three Departments.

<u>The Gould League of Western Australia</u>.

Bird club work has a long history in Western Australia, going back at least to the twenties. Dr. D. L. Serventy who attended the original meeting records that the persons mainly responsible were Mr. C. G. Hamilton, Mr. B. A. Rogers and Mr. T. Edmondson. Mr. J. W. Oates endeavoured to have a branch of the Gould League of Bird Lovers established in the middle thirties but when this was

refused by the Education Department, he went ahead and established a Junior Section of the Western Australian Naturalists' Club. Some years later a conference of Federal Directors of Education decided that club work should be stimulated in schools and as a result of this conference the then Director, Mr. C. Hadley, decided to give the Gould League Departmental approval. Mr. Edmondson contacted interested persons, a League was formed in 1939 and Mr. White, a teacher very interested in bird study, was brought to Perth to be the first secretary.

The Gould League has over the years had a very large membership of school children and it has done much to awaken in boys and girls an interest in the protection of the native fauna.

There is also a Senior Section in the League which has been responsible for representations made to the Government in protest against the alienation of reserves. The Gould League has worked in a similar manner to the Naturalists' Club in protecting fauna and flora reserves. Even though its original title (The Gould League of Bird Lovers) suggests that the League is solely concerned with birds, its interest and activities extend to promoting knowledge of and protection of the animals in Western Australia.

Royal Australian Ornithologists' Union.

Since the formation of the R.A.O.U. in 1900, Western Australian members have taken an active interest in conservation, and have campaigned against the acclimatization of exotic fauna and for the preservation of reserves.

The Royal Western Australian Historical Society.

During 1926 the Western Australian Historical Society was founded under the presidency of Sir James Mitchell, G.C.M.G., prominent local parliamentarian who later became Governor of Western Australia. Sir James continued as President of the Society until his death on the 26th July 1951. The other foundation members were Mrs. Edith Cowan, Mrs. Mary Farrelly and Mr. I. T. Birtwistle. Mr. Birtwistle succeeded Sir James as President and still retains the position today.

The Historical Society has been included in this survey because one of its objects is "to promote public

interest in, and support for the preservation of historical relics, including buildings and sites..." (Western Australian Historical Society Constitution as at 1953). Such buildings and sites would be termed National Reserves under the terms of the Australian Academy of Science Committee on National Parks and Nature Reserves, Notes for Sub-committees.

Since the Society was inaugurated, it has done much to influence public opinion in the need for setting aside historical sites. However, up to the present, it has been able to do little in influencing the Government to form a policy with regard to their preservation.

In 1954 the Historical Society put forward recommendations to the Premier's Department concerning the preservation of certain buildings of historic interest in Perth. At the same time it asked the Government to declare its policy in connection with the preservation of its own buildings. The suggestions put forward by the Society have so far received no official response.

To date the Government has stated no general policy for the preservation of buildings of historic interest, but three buildings and a disused burial ground have been reserved. These are the Round House, Fremantle, which was vested in the Fremantle Harbour Trust in 1936, the Old Mill, South Perth, which was vested in the National Parks Board of Western Australia in 1957, "Strawberry Hill", a property in Albany which was vested in the Albany Municipal Council in 1957, and a disused cemetery in East Perth which contains the remains of many of Perth's pioneers, which was vested in the National Parks Board of Western Australia in 1957.

Since the date of formation of the National Trust of Western Australia (1959), the Historical Society has worked closely with it in matters of this kind. The Society became the Royal Western Australian Historical Society in 1963.

<u>The Tree Society of Western Australia</u>.

During 1956 the Tree Society of Western Australia was formed because a number of citizens felt concerned about the increasing rate of alteration of the natural countryside. In the years that it has been in operation the Tree Society has become a State-wide movement with

branches in many towns outside the city.

The first President was Mr. Neville Roennfeldt who was succeeded later by Mr. Peter Thorn.

The policy which the Society has adopted towards the reserves is that it is keenly interested in securing additional reserves, particularly Class A reserves. Both country and city members keep a close watch on existing reserves to resist alienation, and tree-planting is undertaken.

National Trust of Australia (W.A.).

In September 1959 the National Trust of Australia (W.A.) was formed under the presidency of Sir Ross McLarty, K.B.E., M.M., former Premier of Western Australia. The objects of this organization are to:

1. Restore and preserve historic buildings and those of outstanding architectural merit; and wherever possible to keep them in use.

2. Safeguard the charm and interest of the Australian countryside and coastline in the form of wildflower patches, stands of timber, primitive reserves, national parks, aboriginal relics, vistas, streams, with special regard to the breeding places of native birds, animals and plants.

To this end two Sub-committees, the Sites and Places Committee, and the Buildings Committee, have been set up to make recommendations in connection with areas and buildings which should be set aside in perpetuity. Neither Committee has as yet produced any firm proposals, although the Buildings Committee has presented interim reports to the Council of the Trust. These form the basis of the chapter in this report on Historic Buildings.

Anthropological Society of Western Australia.

The Anthropological Society of Western Australia was founded in 1958. The first President and prime mover in its formation was Dr. R. M. Berndt, Reader in Anthropology at the University of Western Australia (now Professor of Anthropology).

The main object of the Society is to promote the

study of general anthropology with special emphasis on the Australian aborigine, and to encourage anthropological teaching and research.

A Sub-committee of this Society was formed in 1960 to deal with all matters concerning the preservation of aboriginal paintings, carvings, archaeological remains, sacred sites, etc., in Western Australia. The Sub-committee commenced a survey of all archaeological sites in the State, and produced a preliminary report which was submitted to the Sub-committee of the Australian Academy of Science Committee on National Parks and Nature Reserves. This report entitled "A preliminary report of a survey being carried out by the Anthropological Society of Western Australia relevant to the preservation of Australian Aboriginal sites in this State (Mimeo, 1960) provided the basis for the chapter on the preservation of archaeological sites.

III. THE ACTION OF THE DEPARTMENT OF LANDS AND SURVEYS IN CREATING RESERVES

Between 1894, when the Pinjarra reserve was set up, and 1939 the work of the Societies did not directly result in the creation of new reserves, but it is clear that they played a very great part in helping to form and mould public opinion. However, many new reserves were made during this period. A number of these were either set aside as a result of requests made by local authorities in various parts of the State or by private individuals. However, many were set aside at the instigation of the officers of the Lands Department.

Ever since the date of proclamation of the first Western Australian reserve for conservation of fauna and flora, considerable pressure has been put upon the Government to have these reserves thrown open for farming purposes. The views of officials of the Lands Department and the various Ministers administering the Land Act have fluctuated, but the cancellation rate has been very low. It is impossible here to review the history of each individual reserve, but the records of the Lands Department indicate that the Government does not cancel reserves without ample consideration, despite outside pressures. Perhaps the most important development in this respect has been the

steady growth of reliance by the Lands Department upon informed scientific opinion and in particular upon the opinions of the Government Botanist and official Boards and Committees such as the National Parks Board and the Fauna Protection Advisory Committee.

However, apart from aesthetic or scientific reasons, many small flora and fauna reserves are created by the Department; they are set aside as flora and fauna reserves to provide natural windbreaks for, or to prevent land erosion on, adjoining developed utilitarian reserves such as roads, playgrounds, etc. The applications for such reserves are usually made by the District Surveyor when the recommendation for the main reserve is made, but they are separately gazetted. This ensures that the flora reserve is kept separate from the other reserves and is less likely to be developed.

The Governor has the power to vest reserves in bodies expert in conservation methods, in Boards, in local authorities, etc., but the Lands Department has maintained the control of the majority of the small reserves. The fate of these non-vested reserves rests with the Department, but although the setting up and cancellation of reserves is channelled through the Lands Department and thence Cabinet, opinion as to their setting up and cancellation commences at many different levels within the Government.

Western Australia, over the years, has relied ultimately on the sympathy and wisdom of its officials in the Lands Department to give the appropriate Ministers balanced opinions and advice; although this may seem surprising to many conservationists this reliance has been justifiably placed.

OFFICIAL BOARDS

In accordance with the Lands Act, 1898 and the Lands Act, 1933 reserves may be vested in Boards which are set up under the Parks and Reserves Act, 1895-1955.

A number of reserves in Western Australia are so vested, and an account of the history of these Boards is given here.

The Caves Board of Western Australia.

Along the south-west coast of the State there is a strip of Quaternary aeolianite called the Coastal Limestone. In places this limestone is honeycombed with caves which have considerable beauty and tourist potential.

During the 19th century many caves in the south-west were explored, and at the turn of the century it was realised that the caves required protection.

In 1900 the Caves Committee was set up, and its first meeting was held on 31st January 1901. It consisted of Messrs. H. F. Johnston (Surveyor General) as President, and H. F. Farmer, C. E. May and E. J. Scells (Secretary). One of the first active measures taken for protection was on the suggestion of Mr. M. E. Jull (not then a member of the Committee) that all caves should be closed down until such time as the funds were forthcoming to formally and properly open them. This Committee then took in hand the erection of accommodation for tourists at Yallingup. In May 1902 plans were put in hand for the erection of Caves House at Yallingup.

In October 1902 it was decided that the Minister be asked to make the cave reserves Class A under the Permanent Reserves Act, 1899 and place them under the Committee as a properly constituted Board. This was duly agreed to and on the 7th November 1902 the Caves Board was constituted under the Parks and Reserves Act, 1895, with Mr. H. F. Johnston as its first President. The other members of the Board were Messrs. C. E. May, H. F. Farmer, E. Farrar and W. A. Hughes. Mr. Edgar Robinson was appointed to the Board in August 1903, and from that time the Board had its own offices. The reserves vested in the Board at its inception were in the Yallingup area continuing through to the Margaret River area.

On the 25th August 1905 the Yanchep Caves Reserves (No. 9868) were vested in the Caves Board. The Board at this time was Dr. J. W. D. Hackett (President) and Messrs. H. F. Johnston, J. C. G. Foulkes, F. Wilson, W. A. Hughes, M. E. Jull, H. F. Farmer and the Chairman of the Wanneroo Road Board (ex officio).

The Board ceased to function in 1910 and during the eight years of its existence it developed the caves in the Margaret River, Yanchep and Yallingup areas as tourist

resorts.

On the 2nd September 1910 the Hon. J. D. Connolly, M.L.C., Colonial Secretary, was appointed to be a one-man Board of Control for caves previously under the control of the Caves Board. Over the years, additional caves in the Yallingup district, Cowaramup Bay, Margaret River and Yanchep districts were placed under the control of the Board.

The control of the caves was later (20th November 1914) given to Mr. George Emery, General Manager of the State Hotels Department. This small department was administered from the Colonial Secretary's office. At this date the list of reserves had grown by two, Serpentine Falls (No. A3355) and the Coastal Foreshore in the Sussex district (No. 13404). Neither of these was a cave reserve.

The State Hotels Department ceased to exist during 1960, and the cave reserves in the Yallingup area were taken over by the Lands Department. Yallingup was leased to E. M. & E. N. Copley on the 19th December 1960 and under the terms of the lease the Copleys were required to run the hotel and maintain the caves.

The caves in the Margaret River area are now under the control of the Lands Department.

National Parks.

When dealing with National Parks in Western Australia, complications arise because, although the term National Park has come to have extensive official usage, there is no designation of the term in the Land Act. National Parks are in fact no more than parklands set aside for "facilitating the improvement and settlement of the colony". The term has no legal status in itself and its usage appears to be emotive. A National Park as defined by the Australian Academy of Science Committee on National Parks and Nature Reserves in its Notes for Sub-committees is:

> "A spacious land area essentially natural or primitive in character and containing scenery or natural wonders so outstanding that their preservation intact and in perpetuity is essential for the benefit, enjoyment and inspiration of the people."

A number of Boards have been constituted under the Parks and Reserves Act, 1895 to administer "National Parks" and most of these are called "National Park Boards". These Boards have under their control reserves which have been termed "National Parks" as well as parklands, recreational reserves, disused burial grounds, etc. (see p. 54 List of Reserves vested in the National Parks Board of Western Australia). Because the population refers to these reserves as National Parks, a brief account of the National Parks Board and other Boards (such as the King's Park Board, Rottnest Board, and the Trustees of the Houtman's Abrolhos Islands) is given here.

The National Parks Board of Western Australia.

The National Parks Board of Western Australia had its beginnings in the State Gardens Board which was established on the 8th December 1920 under the Parks and Reserves Act, 1895 at the request of Mr. L. E. Shapcott, then Secretary of the Premier's Department. Mr. Shapcott was the sole member of the Board. However, a week later the Board was increased by the addition of another member, Mr. C. G. Morris, Under Secretary for Lands. Mr. Shapcott was appointed Chairman, a position which he retained until his retirement from the Civil Service in 1942.

When the Board was first established, it was given the control of 10 small park and garden reserves in and around the city of Perth (Reserves Nos. 17615, 5957, 7122, A10887, 13012, 12510, 13375, B3595, A1150, A17375).

An interesting history of the Board is given in its publication "The State Gardens Board, Twenty Years Progress and Policy, 1919-1939". In this account the establishment of the Board is attributed to an efficiency and economy campaign initiated by the Hon. James Gardiner, then Colonial Treasurer.

The original grant of the Board was £3,344 in 1920-21 but fell to £1,780 in 1931 to 1934. This meant that the work of improving the parks and gardens given into its charge was a difficult matter. The policy which the Board adopted was:

> "That they (the parks and gardens) need no embellishment beyond being made available and, in some cases, restored to their pristine and natural charm. Gold needs no gilt, and the lily no

> painting. This creed consorts well with economy and simplicity. The aim of the Board therefore has been to make accessible to its domains by road and pathway, built from its own products and resources, adorned by the native flora of each particular haunt, with nature expressing itself through the birds, and trees and bees and flowers, rocks and waters. To these perforce must be added the simple amenities of civilization and comfort, but all within the limited means at command."

Unfortunately this policy was not consistently followed in subsequent years and the value of some reserves was threatened by grazing and other commercial activities. Firm steps have now been taken to retrieve this position.

For the Board no rating or borrowing powers existed and "it had to struggle along with such aid as Ministers, Government officers, and interested and willing staff, private citizens and Town Planners, could extend". It can easily be imagined that if all these people were spurred into action a "prodding force" must have been behind them. Mr. Shapcott was this force, and if it were not for his continued interest, ingenuity and resourcefulness, Western Australia would probably be much poorer in parks with amenities for tourists.

The generosity of Sir Charles McNess during the depression years in the early 1930's was the means whereby the State Gardens Board was able to achieve so much in the way of developed tourist facilities at Sir John Forrest National Park and Yanchep.

> "Sir Charles sought the co-operation of the Government in relieving distress, and the State Gardens Board was found to be a good vehicle of distribution ... . Where men were able to work, the Gardens Board subsidised gifts on a pound for pound basis, and a continuous basic wage was provided for all its workers".

On the 25th August 1942 Mr. Shapcott resigned from the State Gardens Board. On the same date the following members were appointed: Mr. G. L. Needham, Under Secretary for Lands, Mr. W. V. Fyfe, Surveyor General, Mr. H. W. Byfield, Assistant Under Treasurer, and Mr.

C. A. Gardner, Government Botanist.

The State Gardens Board became the National Parks Board of Western Australia on 13th April 1956 and was made a body corporate with perpetual succession and common seal. This Board was and still is responsible to the Minister for Lands. The appointment of trained biologists to the National Parks Board has ensured a more consistent attitude on conservation and the policy now being followed has rectified many of the earlier defects (Jenkins, 1961).

The main reserves which are now under the control of the National Parks Board of Western Australia are given below.

NATIONAL PARKS BOARD OF WESTERN AUSTRALIA

LIST OF RESERVES CONTROLLED AT MARCH 31st 1961

Reserve Number	Land	Purpose	Approx. Area Acres
21569	Canning River Foreshore Araluen-Canning Dam area	Recreation	50
A17375	Swan Foreshore between University Gardens and the Swan River, Crawley	Recreation	65
A20701	Swan, Crawley	Public Gardens	1
25631	East Perth adjoining Disused Cemetery	Public Park	1
A21054	East Perth Disused Cemetery	Disused Burial Ground	11
A25313	Greenmount	National Park	127
A21451	Hamelin Bay	Camping	365
A2994	Swan View (John Forrest National Park)	Park Lands	17
A2995	Swan View (John Forrest National Park)	Public Park	105

Reserve Number	Land	Purpose	Approx. Area Acres
A7535	Swan View (John Forrest National Park)	National Park and Reserve for Native Game	3514
A8164	Swan View (John Forrest National Park)	National Park	11
A17060	Swan, Keane's Point	Recreation and other purposes incidental thereto	5
Pt. A1720	Perth (Portion of King's Park)	Public Park	1
22515	Canning (Lesmurdie Falls)	National Park	80
Pt. A13045	Nelson - western shore of Frankland River (NOTE: Portion of Reserve A13045 east of Frankland River is under the control of the Denmark Road Board as a Board appointed P. & R. Act - see File 4683/27)	Park Lands	910
18722	Nelson, Nornalup	National Park	12240
18723	Nelson and Hay, Nornalup	National Park and Tourist Resort	15500
18724	Hay, Nornalup	National Park	2600
18725	Hay, Nornalup	National Park	1660
A19175	Nelson (Newdegate Island), Nornalup	National Park	10

Reserve Number	Land	Purpose	Approx. Area Acres
A19176	Nelson (Island at mouth of Frankland River), Nornalup	National Park	23
20804	Perth Old Mill, South Perth	Public Recreation	
17070	Penguin Island	Recreation Camping, enjoyment by the public for holidays thereon and for purposes ancillary thereto	50
A18987	Plantagenet, Porongorup Ranges	National Park	5384
A3355	Cockburn Sound	Public Recreation	50
A8615	Serpentine, Serpentine Falls	Park Lands	355
A8650	Cockburn Sound, Serpentine Falls	Park Lands	200
A8651	Cockburn Sound, Serpentine Falls	Park Lands	150
20357	Cockburn Sound	Park and Recreation	474
23894	Cockburn Sound, Serpentine Falls	Recreation	211
A14792	Plantagenet, Stirling Ranges	National Park	269155

Reserve Number	Land	Purpose	Approx. Area Acres
A9868	Swan, Yanchep Caves	Protection and Preservation of Caves and Flora and for Health and Pleasure Resort	6069
20745	Swan, Yanchep Caves	Park and Recreation	140
12439	Swan, Yanchep	Camping	44
15997	Swan, Yanchep	Protection of Flora	160
24436	Swan, Yanchep	Protection of Flora	279

The Nornalup Reserves Board.

The Nornalup Reserves Board was set up under the Parks and Reserves Act, 1895 on the 5th December 1924 and the National Park at Nornalup Inlet (Reserves Nos. 18722/25) was placed under its control. The Board consisted of the Under Secretary for Lands, the Surveyor General and the Conservator of Forests. On the 27th October 1939 the Town Planning Commissioner was added to the Board. The records of the Lands Department state that another National Park at Nornalup Inlet (Reserves Nos. A19175 and A13045) was added to those already under the control of the Board at this time. The Director of the Tourist Bureau became a member of the Board on the 22nd March 1946.

The records of the Lands Department indicate very little activity by the Board in controlling and improving its reserves, but the Board's own records of its activities could not be obtained. It is known, however, that by-laws were laid down by the Board to control the Park.

The Board was cancelled on the 29th August 1947 and all its reserves were vested in the State Gardens Board (which later became the National Parks Board of Western Australia). The members of the cancelled Board were already members of the State Gardens Board.

The Pemberton National Parks Board.

During 1928 moves were made by the Pemberton Parents and Citizens Association to have the hillside opposite the town and siding on Big Brook reserved for scenic purposes. Approaches were made to the Minister for Lands, then Hon. W. C. Anguin, to have this land set aside as a recreation reserve by representatives of the Association (Mr. C. A. Glew and Dr. A. G. Abbott). The Minister agreed and on the 16th May 1930 the Pemberton National Parks Board was constituted under the Parks and Reserves Act, 1895. This Board consisted of Mr. E. Fuge, Mr. C. A. Glew and Dr. A. G. Abbott. At that time it only controlled the recreation reserve originally requested (No. 19857) and for some years their work consisted mainly in developing this reserve as a swimming pool and recreation area.

Mr. Glew and Dr. Abbott left Pemberton towards the end of the 1930's or early 1940's but they still remained members of the Board. They resigned in 1942.

With the resignation of these two members the Board's numbers were increased to seven on the 7th April 1943 and the following were appointed: Messrs. A. R. Kelly, J. J. Honniball, E. Fuge, F. E. Young, H. D. Green, J. N. Rowberry and C. Roby. Mr. Fuge on 30th July 1943 was appointed President of the Board.

Over the years, four other reserves were added to the Board's control: A7691 (Warren National Park), A19424 (Brockman Forest), A7692 (Beedelup National Park), and A17519 (Vasse Road Bridge). These reserves, together with the original reserve, total 8140 acres.

No finance was available to the Board even from local sources or from Government until 1956, when it started receiving Government support commencing with £500 towards approved capital development and this has been increased progressively to £1,500 which it is receiving today.

The Board's policy over the years has been broadly to keep such reserves as Warren National Park and Beedelup National Park in virgin condition, providing access only, while the recreational reserve in town (No. 19857) contains local and tourist facilities.

The King's Park Board.

The establishment of Perth Park (now King's Park) was the result of a suggestion made by His Excellency the Governor of Western Australia, Sir Frederick Weld in 1871. Sir Frederick later approved the setting aside under the Land Regulations of 1872 of 432 acres for "the purpose of a public park and recreation" on the 1st October 1872. In 1890 a further 548 acres were added at the suggestion of Sir John Forrest and the whole park was classified Class A on the 23rd March 1900 under the Permanent Reserves Act, 1899. Today the area of the Park is approximately 1,000 acres.

During 1895 a committee was formed to administer the reserve (the Perth Park Committee) and its members were Sir John Forrest (President), Colonel G. B. Phillips, then Commissioner of Police, Mr. A. Lovekin, and the Hon. J. W. Hackett, M.L.C. On the 21st January 1896 the Perth Park Board was constituted under the Parks and Reserves Act, 1895 and this Board comprised all the members of the Perth Park Committee with the addition of Messrs. A. Temple Poole (the Government Architect) and B. C. Wood, M.L.A. During August 1901 the Board changed the name of the Park to "King's Park", and from thenceforward the Board became known as the King's Park Board.

Lord Forrest remained the President of the Board until his death in 1918. Mr. Lovekin succeeded Lord Forrest, a position which he retained until his death in December 1931. The subsequent Presidents were Mr. W. H. Vincent (1932), Sir William Lathlain (1932-1936), Mr. W. A. Saw (1936-1949), Sir John Dwyer (1949-1954) and Sir Thomas Meagher (1954-).

There appears to have been some initial uncertainty as to how this large parkland should be developed for the enjoyment of the community. Up to 1904 small areas were set aside for sporting purposes. On May 11, 1897, Hale School (then High School) was granted the use of an area as a playground as tenants at will of the King's Park Board. On July 29, 1899, the King's Park Tennis Club and

on June 22, 1904, the West Perth Bowling Club were granted separate pieces of land under the same conditions.

During the next half century, however, all similar applications for land in the Park (including those for University and Hospital purposes) were refused by the Board and a tradition grew that the Park was "dedicated and permanently reserved for the preservation of its indigenous flora, the only variation from this policy being a fringe of lawns and shrubberies in certain situations to meet intensive public usage" (King's Park, W.A. Government Tourist Bureau, 1950, p. 1). Signboards in the Park stated that:

> "This park was founded in 1873. Its area is 1,000 acres and it has for its primary object the preservation of its indigenous flora"
> (West Australian, September 3, 1957).

In 1932 the Government submitted a plan for the use of 34 acres for a hospital site. The Board opposed this, and the plan did not develop.

In 1940 the King's Park Board decided to restrict the area to be devoted to the preservation of the native flora. It was laid down that "the area enclosed between May and Forrest Drives be retained and reserved for the preservation, regeneration and representation of its indigenous flora" (King's Park Board Minutes, October 18, 1940). However nothing was done to implement the new policy until 1954. The Perth City Council then approached the Board for 20 acres of bushland alongside King's Park Road for an aquatic centre. The Board felt that this was an amenity in keeping with the Park's purpose and approved the application. However opposition to the move, on the grounds that it would interfere with the native flora, resulted in the passing of an Act by Parliament rejecting the project. This Act (an amendment to the Parks and Reserves Act which is most recently reprinted and amended as the Parks and Reserves Act, 1895-1955) stipulates that the King's Park Board shall not establish an aquatic centre, or orchestral shell, or lease any part of the Park, without the consent of both Houses of Parliament. It also prevents the Board from erecting any structure in the Park for recreational purposes, from which the public are excluded except upon payment of a fee, unless the consent of the Governor in Executive Council has been obtained. Consent will not be given if native flora is to be despoiled (Sect. 5(3)).

The Perth City Council, with the approval of the King's Park Board, attempted to get an enabling bill through Parliament for the aquatic centre in 1957 and again in 1959, but the proposals were defeated. Thus Parliament, in effect, set its approval on the policy of holding the Park as a reserve of indigenous bushland.

The matter was re-opened in October 1963 when the King's Park Board announced a new plan for the development of the Park which would involve the zoning of 150 acres for sporting purposes. The Premier, Hon. Mr. David Brand, expressed the opinion that there was no need for further legislation to enable the zoning scheme to be carried out (West Australian, October 16, 1963) and in response to a deputation which followed public controversy he gave his assurance that the zoning plan did not alienate areas of the Park for exclusive use. He reiterated that designation of areas for exclusive use, or for leases for sporting purposes, would be laid before Parliament (West Australian, December 13, 1963).

Execution of Board policy in the Park has been the responsibility of superintendents and, since 1938, the positions of superintendent and secretary to the Board have been combined. The superintendents were Messrs. Feakes (1896-1904), J. Sheath (1904-1913), J. E. Heath (1913-1938), and J. E. Watson (1938-1961). A Director was first appointed in 1961 (Dr. J. S. Beard).

The finance of the Board has been mainly derived from Government grants which commenced in 1896 with a grant of £4,000. During 1960/61 the Board received Government funds to the amount of £25,900. During the time that Mr. Lovekin was President (1918-1931), the Board's grants were not sufficient to meet its needs and Mr. Lovekin donated several thousand pounds towards the running costs of the Board to carry out its work of park management.

Mr. Lovekin in his book "The King's Park, Perth - W.A." (E.S. Wigg & Son, Perth, 1925) gives an historical account of the Park from 1872 until 1925. A committee of the Western Australian Naturalists' Club have also published an account and very full assessment of the value of the Park as a reserve of native bush, and of its history in this respect (The Western Australian Naturalist, August 1957).

Rottnest Island Board.

In his book "Rottnest Island in History & Legend" (Rottnest Board of Control, 1948), Dr. W. Somerville gives a detailed account of the development which led up to the setting aside of Rottnest Island as a Class A Reserve for the purposes of public recreation on the 25th May 1917.

In 1916, the second Wilson Cabinet with Hon. J. D. Connolly as Colonial Secretary, began a short period of office which terminated in June 1917. Mr. Connolly had been interested in developing Rottnest Island as a tourist resort since 1903 when he was also Colonial Secretary. However, although he endeavoured to increase the Island's facilities, his efforts did not gain the support of his Government until 1917 when the Island was declared a recreation reserve. At approximately the same time as the reserve was set up, Mr. Connolly was appointed Agent General for Western Australia and as a consequence he played no part in the later development of the Island (Somerville, 1948).

On the 18th May 1917 a Board of Parks and Reserves for the Control and Management of Rottnest Island was constituted under the Parks and Reserves Act, 1895. This Board consisted of the Colonial Secretary, Mr. (later Sir Hal.) Colebatch (President), Messrs. J. Allen, J. McCallum Smith, J. Scadden, C. E. Crocker, and Dr. W. A. Trethowan. Succeeding Presidents were Hon. H. K. Maley, M.L.A. (1923-24), Hon. W. C. Anguin, M.L.A. (1924-1927), Hon. A. McCallum, M.L.A. (1927-28). After 1928 the position of President was abolished and from then on the meetings of the Board were held under a Chairman appointed by the Governor. The men who have filled this position in succeeding years were H. F. Allen, J.P., F.R.I.A., (1928-1933), Hon. W. H. Kitson, J.P., M.L.C. (1933-1947), Hon. A. V. R. Abbott, M.L.C., (1947-1953), Hon. L. F. Kelly, M.L.A. (1953-1959), Hon. H. W. S. Bovell, M.L.A. (1959-).

On the 13th February 1942 the Board became known as the Rottnest Island Board of Control and by the same Order in Council was given power to lease the whole or part of the Island with the Governor's approval. In 1956 the name was changed once more to the Rottnest Island Board, and it was made a body corporate and given perpetual succession.

The size of the reserve has been altered over the years. When the reserve was first declared on the Island in

1917, its area was 4,000 acres. In 1935 Dyers and Green Islands were added. In 1936 a further acre was added and in 1938 the area was increased by a further 16 acres. On the 7th January 1951 a Reserves Act was passed which alienated approximately 48 acres for use by the Commonwealth Government for defence purposes. A similar Act was passed in the following year and a further one acre was given to the Commonwealth for defence purposes.

Until 1959 development appears to have been haphazard, and in that year a "Five Year Plan of Development" was adopted by the Board. Of the early years Somerville has said:

> "From the outset the Board found itself practically helpless from lack of funds, and in the impossible position of having to develop a State asset without any financial assistance from the State."

In 1917, because of this lack of finance, the Board decided to seek the erection of a prison on the Island so that the inmates could be used for labour. This plan, however, failed. In 1932 the Board agreed that building leases should be granted for residential blocks. Accordingly, under the provisions of the Permanent Reserves Act, 1899, a Bill was introduced before Parliament to this effect. It was defeated. To the present day the Board's finances have been derived solely fron rental of tourist and business premises, landing fees, bus trips, boat hire, and sale of electricity. It does not receive an annual Government grant.

In 1959 the Government agreed to provide money on a pound-for-pound basis during 1960-65 for the development of the tourist facilities on the Island.

From the Board's inception its administrative offices have been on the Island. Its first administrative officer was Mr. S. W. Cusack (Acting Secretary) who held the position from 1917 to 1923. Mr. S. Hayward became Secretary in 1923 and retained the position until 1935. From this date the position of Managing Secretary was created and the first appointee was Mr. J. B. Stark.

Trustees of Houtman's Abrolhos Islands.

During 1929 the Geraldton Municipal Council decided to make representations to the Government, through

the Director of the Government Tourist Bureau, to have the Islands of Houtman's Abrolhos set aside as a tourist resort. The outcome of this request was the setting up of the Abrolhos Islands Board of Control under the Parks and Reserves Act, 1895 and the Board was given control of the Islands under Section 43 of the Land Act, 1898.

The Board consisted of Messrs. C. T. Davis (President), J. H. Foster, L. W. Shepheard, A. H. Milford, C. Hosking, W. Trigg (Secretary), and Mr. M. J. Day. All members were residents of Geraldton.

The Board received no grant and from the outset efforts were made to make the Islands self-supporting. The Board suggested that it should have the sole right to exploit the surrounding waters, and that the finance gained be used for the benefit of the Islands, but this idea was not agreed to by the Government. Absence of finance has been responsible for the present lack of tourist facilities on the Islands.

Until 1946 the Islands were not accessible to tourists unless they had their own craft or made special hires. In 1946 a ferry service was started from Geraldton to Pelsart Island where buildings which had been erected some years previously by the British Phosphate Company were used as a tourist hostel. In 1950 Mr. A. O. Gaze leased Pelsart Island from the Board. The lease was soon terminated.

The Fauna Protection Advisory Committee has been concerned with the conservation of the fauna of the Islands. The Board co-operated with the Advisory Committee

During 1949 and 1950 moves were made by the Commonwealth Department of Civil Aviation to have a small aerodrome made on Pelsart Island. However, because of the damage this would have caused to the breeding grounds of birds, the matter was dropped. On the 8th February 1954, by Order in Council:

> "All birds and animals (excepting rodents and snakes) were given complete protection on all the Islands of Houtman's Abrolhos".

This was the direct result of recommendations made by the Fauna Advisory Committee.

The Board of Control became known as the Trust-

ees of Houtman's Abrolhos Islands and was made a body corporate with perpetual succession and common seal on the 6th December 1957, and the reserve was vested in it under Section 33 of the Land Act, 1933.

In 1959 moves were made to have a tourist resort set up in West Wallabi Island but the scheme was never finalised.

IV. THE EFFECTS OF THE NATIVE FLORA PROTECTION ACTS AND THE NATIVE FAUNA PROTECTION ACT ON THE CONSERVATION OF LAND, 1912-1961

Native Flora Protection Acts.

Under the Land Act, 1898 and the Parks and Reserves Act, 1895 the flora of reserves could be protected by regulations which could be made by invested or controlling bodies or persons. In 1912 the Native Flora Protection Act, 1912 was proclaimed and this gave protection to a number of species of native plants in all Crown Land and reserves. This Act (and subsequent Acts) were, and are, administered by the Minister for Forests.

The Native Flora Protection Act, 1912 was the first of a series of statutory regulations which gave protection to the native plants of Western Australia. Under this Act (1st Schedule) Acacia or Wattle, Anigozanthus or Kangaroo-paw, Boronia, Grevillea, Hovea, Hypocalymna, Kennedya, Leschenaultia, Nuytsia or Christmas Tree were protected from wilful destruction on Crown Lands. Until 1912 the flora reserves were not protected except by regulations and by-laws, and between 1912 and 1938 the only species protected (except by local regulations, etc.) were those mentioned in the Schedule to the Act.

Very little information can be found about the circumstances which led up to the passing of the Native Flora Protection Act, 1912. The Hon. W. Kingsmill who introduced the Bill before Parliament appears to have been one of the prime movers, but whether the Government Botanists of the time had anything to do with it cannot be ascertained.

In 1935 the Native Flora Protection Act, 1912

was repealed and the Native Flora Protection Act, 1935 was proclaimed. Through this Act the number of protected species on the 1st Schedule was considerably enlarged, and provisions were made to increase the effectiveness of its enforcement.

The Hon. R. S. Sampson, M.L.A., who introduced the Bill before Parliament paid tribute to the help which he had received from the Government Botanist, Mr. C. A. Gardner, the Town Planning Commissioner, Mr. D. L. Davidson, Mr. W. Loaring of Bickley, and Mr. J. C. Taylor of Perth.

In 1938 a major step forward was taken insofar as the overall protection of native flora was concerned when the Native Flora Protection Act, 1935-1938 was proclaimed. Through this Act flora reserves became as effective as legislation can make them because it provided that the Governor may proclaim that:

> "on any specified Crown Lands or in any State Forest or specified portion thereof, or on any specified land reserved for a public purpose under the Land Act 1933, all wildflowers or native plants are protected under this Act."

Any particular species may be protected throughout the State by similar proclamation.

By proclamation gazetted on the 16th August, 1963, all wildflowers became protected in Western Australia on -

(a) All Crown Lands, State Forests, lands reserved for a public purpose under the provisions of the Land Act, 1933, or any other Act and every road within the South-West and Eucla Divisions of the State within the meaning of the Land Act, 1933.

(b) All parts of the State outside the said Divisions that are reserved under the provisions of the Land Act, 1933, for the protection of indigenous flora or fauna.

<u>The Native Fauna Protection Act, 1950-1954</u>.

The passing of the Native Fauna Protection Act,

1950 was a consequence of the Fauna Advisory Committee which was set up in 1944 by the Hon. A. A. Coverley, M.L.A., the Minister controlling the Game Act, 1912-1913, to advise him on the protection of fauna. The influence of the members of the Western Australian Naturalists' Club Committee on Conservation was undoubtedly very strong at the time; four of the five members of the Fauna Advisory Committee were members of the Club Committee as well.

The members of the Fauna Advisory Committee were Mr. A. J. Fraser, Chief Inspector of Fisheries (Chairman), Mr. L. Glauert (Curator of the Western Australian Museum), Dr. D. L. Serventy (Research Officer, Fisheries Division, C.S.I.R.O.) and Major H. M. Whittell (an eminent local ornithologist). The Chief Inspector of Vermin was later added so that the Committee's work could be closely related to that of the provisions of the Vermin Act, 1918.

The Native Fauna Protection Bill was introduced by the Hon. A. V. R. Abbott (Minister for Fisheries) who said that the Fauna Advisory Committee (which had advised on the contents of the proposed legislation) felt that it should have some proper legislative authority and had advised him that fauna laws in Western Australia should be brought up to date and placed more into line with the laws operating in other States.

The Act was passed on the 1st July 1952 and the Game Act, 1912-1913 was repealed. The Committee was replaced by the Fauna Protection Advisory Committee of Western Australia under this Act.

The main feature of the Act was that all terrestrial vertebrate fauna throughout Western Australia became protected, except species declared by Government proclamation as vermin or to be unprotected. As a result of this Act those species of vertebrate fauna not previously protected under the Game Act received blanket protection and fauna reserves gained in effectiveness. However, even in fauna reserves today, species designated "unprotected" still require protection by regulations and by-laws of controlling and vested authorities in order to prevent their destruction.

The Act, which is controlled by the Hon. Minister for Fisheries made provision for the appointment of a Chief

Warden of Fauna responsible for the administration of the Act, a position which was to be held by the Chief Inspector of Fisheries until some other person was appointed by the Governor. Mr. A. J. Fraser, Chief Inspector of Fisheries and later Director of Fisheries, has held the position of Chief Warden of Fauna since the passing of the Act.

Provision was also made for the appointment of a Fauna Protection Advisory Committee of Western Australia comprising the Chief Warden of Fauna (Chairman), Chief Inspector of Vermin, the Conservator of Forests, and three other members whose term of office is for three years. At least one of these three other members is to be other than a civil servant and must possess wide practical knowledge of the native fauna of Western Australia. The main function of the Committee under this Act is to advise the Minister in relation to the conservation of fauna.

The original members of the Fauna Protection Advisory Committee were:

> Mr. A. J. Fraser (Chief Warden of Fauna) - ex officio, H. M. Whittell, O.B.E., L. Glauert, B.A., F.G.S., Dr. D. L. Serventy, B.Sc., Ph.D., the Conservator of Forests, and the Chief Inspector of Vermin.

The Committee is a corporate body which can have reserves vested in it under the provisions of Sections 29 and 33 of the Land Act, 1933 (see the chapter on legislation). The Act also gives the Minister power to enter into agreements with owners of land to have areas set aside for use as sanctuaries for the preservation of fauna.

The Committee has on certain occasions recommended to the Lands Department that certain lands be created fauna reserves. When such reserves are created, they have not always been vested in the Committee although the fauna on these lands is its responsibility. Twenty-eight reserves have been vested in the Committee.

Under the provisions of the Act as it stands at the present day, the Fauna Protection Advisory Committee may, with the approval of the Minister, cause to be carried out such research into the conservation and protection of fauna as it thinks fit. For example, the

Committee took advantage of this provision to send an expedition to Bernier and Dorre Islands in 1959. The results of this expedition, and its recommendations provide an example of work which must be done in assessing the scientific value of reserves. They were published as Fauna Bulletin No. 2, "The Results of an Expedition to Bernier and Dorre Islands, Shark Bay, Western Australia, in July 1959" by W. D. L. Ride, R. D. Royce, C. H. Tyndale-Biscoe, G. F. Mees, and A. M. Douglas.

The recommendations were adopted by the Fauna Protection Advisory Committee and by the Minister for Fisheries, Hon. R. Hutchinson, D.F.C., M.L.A. These recommended that:

> "Bernier and Dorre Islands remain a nature reserve for the preservation of flora and fauna; that no part of them be utilised for any other purpose because of the danger of the unwitting introduction of alien species or fire. That no jetty or pier be built from them which, in allowing decked craft to moor alongside, might facilitate the transference of alien species such as rodents from the vessels to the wharf; that parties of visitors to the Islands be strictly supervised to prevent accidents with fire; that dogs be prohibited; that firearms be prohibited except by the special permission of the Chief Warden of Fauna; that a major effort be made to acquaint the fishermen of Shark Bay with the great value of the reserves, of the great danger of lighting fires on them; and finally, that the goat population of Bernier Island be exterminated without delay."

V. CONCLUSIONS

This historical survey has revealed a number of important factors which have a direct bearing on the state of reserves in Western Australia at the present day.

Firstly, although legal provisions were present for reserving land from the beginning of settlement in Western Australia, it was not until land development became widespread that the need was felt for the reservat-

ion of extensive natural areas.

Secondly, although numbers of non-governmental bodies and individuals were actively interested in preserving parts of the indigenous flora and fauna, and historical and archaeological sites, in perpetuity, their most important contribution was to develop public opinion. This change of opinion had its effects on the members of the Government and its departments who have, as a result, created many reserves over the years.

Thirdly, a number of clear-cut policies towards reservation and conservation have emerged in recent years (1949-1961) and, with the change in the climate of opinion and the continued goodwill of the Government, important numbers of reserves have been set aside during this period. Unfortunately, the real value of reserves is not always fully appreciated in the districts in which they occur, and there has been, and will be, constant and very considerable local pressure to have them alienated.

There are hopeful signs that the present policy of the Education Department with respect to nature study is having a most satisfactory effect upon the viewpoint of today's children.

The other factor which has proved most important has been the growing number of interested professionals. This has made itself felt on the policy of the Government, and has resulted in positive action being taken.

Reserves today are numerous, but they are badly distributed. The various Departments who administer them do not possess adequate physical means of controlling them. The Fauna Wardens are nearly all honorary, and even the Chief Warden of Fauna also holds the major position of Director of State Fisheries.

It appears that what is needed now is the development of a new policy towards obtaining for Western Australia a carefully planned reserve system, perhaps under the control of a single authority. The reserves of this system should be so distributed to include all major categories of fauna, natural scenery, historical and archaeological sites. The duty of the controlling authority should be to protect and administer the reserves to the best advantage both of the reserves themselves as

natural areas, and for the public who may wish to visit and enjoy them.

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Mr. R. A. Kelly, Secretary of the Pemberton National Parks Board.

Mr. J. E. Watson, recently retired Secretary of the King's Park Board.

Mr. D. J. Sullivan and Mrs. G. Ward of the Rottnest Island Board.

CHAPTER 3

List of National Parks and Flora and Fauna Reserves in Western Australia 1829—1961

KEY TO ABBREVIATIONS OF ACTS

L.R. 1872 = LAND REGULATIONS, 1872
L.R. 1887 = LAND REGULATIONS, 1887
P.&R.1895 = PARKS AND RESERVES ACT, 1895
L.A. 1898 = LAND ACT 1898
Per.R. = PERMANENT RESERVES ACT, 1899
L.A. 1933 = LAND ACT, 1933
(43) = SECTION 43, LAND ACT, 1898
(42) = SECTION 42, LAND ACT, 1898
(34) = SECTION 34, LAND ACT, 1933
(33) = SECTION 33, LAND ACT, 1933

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
8.10.1872	228	L.R. 1872	King's Park Board (42)	797/90 800/94 1570/96 1521/90
16. 2.1894	194	L.R.1887	Lands	2507/93
20. 7.1894	698	L.R.1887	Lands	641/92
23. 8.1895	1390	L.R.1887 P.&R.1895	National Parks Board of W.A. (33)	2258/48 1932/95 12880/98
29. 9.1899	3153	L.A.1898	Lands	11213/99
30.11.1900	4509	Per.R.	National Parks Board of W.A.	13479/98
1901	280	Per.R. P.&R.1895	National Parks Board of W.A. (33)	13880/98 1432/95
7.11.1902	4253	Per.R.	Lands	15750/08
29. 5.1903	1346	Per.R.	Lands	11823/02
17. 7.1903	1856	Per.R.	Lands	1425/02
24.11.1904	3448	L.A.1898	Lands	7517/1905
25. 8.1905	2790	Per.R. L.A.1898	Lands	1179/03
29. 9.1905	3042	Per.R. L.A.1898	Lands	709/96
22.12.1905	3740	L.A.1898	Lands	11213/99
25.10.1907	3490	Per.R. 1898 & 1899	Lands	5287/1907

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
Public Park	Mt. Eliza Perth	"A"	1720		920
Preservation of Native Flora & Fauna	Murray		2461	7. 4.1911	160,000
Preservation of Caves	Sussex		2565		16,000
National Park	Swan View	"A"	2995		105
Boronia	Albany	"A"	6862		175
Parklands (later National Park).	Swan (near Swan View) Tunnel	"A"	7537		3514
Parklands	Swan View	"A"	2294		17
Protection of Caves & Flora for Health & Pleasure Resort	Sussex	"A"	8427/ 38		11,660
Protection of Caves & Flora for Health & Pleasure Resort	Sussex	"A"	8694		550
Protection & Preservation of Caves & Flora for Health & Pleasure Resort	Sussex	"A"	8768		600
Timber (Tuart)	Wellington near Stirling	"C"	9970		133
Protection & Preservation of Caves & Flora & for Health & Pleasure Resort	Swan (Yanchep)	"A"	9868		6,070
Protection & Preservation of Caves & Flora and for Health and Pleasure Resort	Sussex (Cowaramup Bay)	"A"	7406		360
Boronia Protection	Plantagenet Near Mt. Barker	"A"	10003		261
Protection & Preservation of Caves & Flora & for Health & Pleasure Resort	Sussex	"A"	10922		295

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
24. 7.1908	1928	L.A.1898	Lands	6682/08
27.11.1908	3239	L.A.1898 Per,R.	Lands	7608/07
11.12.1908	3380	L.A.1898	Lands	6682/08
15. 1.1909	88	L.A.1898 Per.R.	Pemberton National Parks Board (33)	74/01
12. 3.1909	710	L.A.1898 Per.R.	Lands	14950/08
26. 3.1909	817	L.A.1898	Pemberton National Parks Board (33)	74/01
25. 2.1910	615	L.A.1898 Per.R.	Lands	13991/05
8. 7.1910	1632	L.A.1898	Lands	1450/00
30. 9.1910	3004	L.A.1898 P.&R.1895	National Parks Board of W.A. (33)	7461/10 4833/27
8. 9.1910	2393	L.A.1898	Lands	10534/10
10.11.1910	3402	Per.R. L.A.1898	Lands	8521/02
24. 2.1911	934	L.A.1898	Lands	14643/10
2. 6.1911	1782	Per.R.	Lands	11213/99
10.11.1912	4374	L.A.1898 Per.R.	Fauna Protection Advisory Committee (33)	5753/12
30. 5.1913	1941	L.A.1898	Lands	405/12
6. 6.1913	1980	L.A.1898 P.&R.1895	National Parks Board of W.A. (42)	3809/08
9.10.1914	4142	L.A.1898	Lands	8927/12
8. 1.1915	6	L.A.1898	Lands	3747/14
15. 1.1915	44	L.A.1898	Local Authority (42)	5607/14
26. 2.1915	1100	L.A.1898	Lands	162/15

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
Preservation of Native Flora (Pitcher Plant)	Gledhow Sub Lot 15	"C"	5205		9
Protection of Flora & Fauna	Barrow Is.	"A"	11648		50,000
Protection of Flora (Pitcher Plant).	Plantagenet Young's Siding	"C"	11650		10
National Park	Nelson Beedelup Brook	"A"	7691		3350
Park and Recreation	Sussex near Margaret River Tea Lake	"A"	11759		145
National Park	Nelson (Carey Brook)	"A"	7692		3350
Resting Place & Protection of Flora	Kojonup - Plantagenet	"A"	12590		1335
Timber	Wellington near Lake Preston	"A"	7655	31.10.1953	7500
Parklands	Frankland River	"A"	13045		920
Fauna & Water Pisciculture	Edel & Victoria Murchison	"C"	12996		3200
Tuart Timber	Stirling Estate	"A"	9528		1341
Native Game	Wagin	"C"	13279		245
Protection Boronia	Albany near Mt. Barker	"A"	6862		175
Flora & Fauna	Williams	"A"	14398		292
Fauna	Sussex	"C"	14787	25. 1.1929	4300
National Park	Plantagenet	"A"	14792		270,000
Flora Flowering Gum	Hay (in Point Irwin)	"A"	15677		1524
Flora & Fauna	Toolbin	"C"	15787		5
Protection of Indigenous Flora	Meekatharra	"C"	15815		7862
Preservation of Caves	Kondinin	"A"	1672		1000

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
24. 3.1916	482	L.A.1898 Per.R.	Lands	1362/91
25. 5.1917	857	L.A.1898 P.&R.1895 Per.R.1899	Rottnest Board of Control (33)	13688/02
14. 3.1919	652	Per.R. L.A.1898	Lands	8474/08
3. 9.1920	1460	L.A.1898	Pemberton National Parks Board (33)	2519/20
14. 3.1921	380	L.A.1898	Lands	7763/20
21.10.1921	1889	L.A.1898	Local Authority (33)	2833/20
30.11.1923	2329	L.A.1898	Local Authority (33)	6465/23
8. 2.1924	194	L.A.1898	Lands	11213/99
12. 8.1924	1633	L.A.1898	Local Authority (33)	11294/10
22. 8.1924	1527	L.A.1898	Lands	18131/11
26. 8.1924	1822/3	L.A.1898	National Parks Board of W.A. (33)	1673/24
29. 8.1924	1560	L.A.1898	Lands	1851/22
19. 9.1924	1667	L.A.1898	Lands	5045/97
3.10.1924	1882	L.A.1898	Lands	11213/99
3.10.1924	1882	L.A.1898	Lands	10356/98
30.10.1924	1882	L.A.1898	Lands	11213/99
14.11.1924	2131	L.A.1898	Lands	11213/99 Vol 2
3. 7.1925	1219	L.A.1898	Lands	11213/99
4. 9.1925	1581	L.A.1898 Per.R. P.&R.1895	National Parks Board of W.A. (33)	4214/25

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
National Park	Greenmount	"A"	1847		17
Recreation	Rottnest Island	"A"	16713		3962
Native Fauna	Avon (near Walvamouring Lake)	"A"	17186		718
National Park	Nelson	"A"	17519		520
Protection of Flora	Nelson	"C"	17672		1
Flora	Kwolyin	"C"	17824		10
Camping, Motel, Caravan Park, Recreation & Conservation of Timber & Flora & Fauna	Margaret River	"C"	18451		6
Protection of Boronia	Hay near Sheepwash Creek	"C"	18536		130
National Park	Margaret River	"A"	18720		44
National Park	Williams	"A"	18698		370
National Park	Nelson & Hay Nornalup Inlet	"C"	18722/ 3/4/5		29990
National Park	Nelson Manjimup-Nornalup Rd.	"C"	18705		2660
Timber & Parklands	Murray	"A"	4596		160
Protection of Flora	Plantagenet near Redmond	"C"	18739		3700
Water & Protection of Flora	Plantagenet	"C"	14493		1190
Flora	Plantagenet	"C"	18740	15. 9.1939	1296
Protection of Flora	Plantagenet	"C"	18772		476
Protection of Flora	Plantagenet	"C"	18741		890
National Park	Plantagenet (Porongorup Range)	"A"	18987		5386

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
12. 3.1926	536	L.A.1898 Per.R.	Lands	7461/10
19. 3.1926	581	L.A.1898	Lands	5724/25
30. 7.1926	1514	L.A.1898	Lands	11213/99
28. 1.1927	256	L.A.1898 Per.R.	Lands	74/01
1. 4.1927	899	L.A.1899	Lands	3771/13 4926/08
30. 9.1927	2258	L.A.1898	Lands	8985/00
27. 7.1928	1735	L.A.1898 Per.R. P.&R.1895	National Parks Board Pemberton (33)	1629/28
10. 8.1928	1809	L.A.1898	Lands	8985/00
1. 3.1929	655	L.A.1898 Per.R.	Lands	6231/28
26. 4.1929	1046	L.A.1898 Per.R.	Local Authority (33)	6169/28
16. 8.1929	1823	L.A.1898 Per.R. P.&R.1895	Local Authority (33)	10439/97
27. 9.1929	2240	L.A.1898 Per.R.	Lands	2711/27
1.11.1929	2436	L.A.1898 Per.R.	Abrolhos Islands Board (33)	3756/29
7. 2.1930	241	L.A.1898	Lands	11213/99 Vol. 2.
21. 2.1930	385	L.A.1898	Lands	3500/29
21. 2.1930	385	L.A.1898 Per.R.	Lands	11702/09
21. 3.1930	866	L.A.1898	Lands	846/30
9. 5.1930	1275	L.A.1898 Per.R.	Lands	9649/01
20. 6.1930	1498	L.A.1898	Lands	611/11
20. 6.1930	1498	L.A.1898	Lands	3289/13

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
National Park	Nelson (a) Island at mouth of Frankland River (b) Newdegate Island	"A"	19176		23
		"A"	19175		10
Flora	Wellington	"C"	19198	Now incl. State Forest No. 5	190
Protection of Flora (Boronia)	Hay near Mitchell River Bridge	"C"	19292		130
National Park	Nelson (near Warren Bridge)	"A"	19424		120
Timber & National Park	Plantagenet (Mt. Hallowell)	"C"	14959		600
Flora	Hay	"C"	5028	30. 9.1927	100
National Park	Nelson Pemberton	"C"	19857		300
Protection of Flora Red Flowering Gums	Hay	"C"	19881		2650
Flora	Avon	"A"	20041		1441
Flora & Fauna	Swan nr. Gooletail Lake	"A"	20091		400
National Park	Yunderup	"A"	20215		194
Protection of Flora	Plantagenet	"C"	19673		405
Public Recreation & Tourist Resort	Indian Ocean (West of Geraldton Is. Houtman's Abrolhos, North Is. Wallabi, Easter & Pelsart Groups.	"A"	20253		-
Protection of Native Flora	Wellington	"C"	20368		49
Protection of Native Flora	Melbourne & Victoria	"C"	20372		1930
Native Flora	Williams (n.e. of Barton)	"C"	15855		100
Flora	Victoria	"C"	1017		1154
Protection of Native Flora	Victoria	"A"	331		320
Flora	Ninghan	"C"	13306		41
Flora	Kojonup	"C"	15388		399

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
6. 2.1931	565	L.A.1898 Per.R. P.&R.1895	Local Authority (42)	3988/30
29. 1.1932	110	L.A.1898	Lands	2489/91
29. 1.1932	110	L.A.1898	Lands	1432/89
12. 2.1932	216	L.A.1898	Lands	2662/31
29. 7.1932	1064	P.&R.1895 L.A.1898 Per.R.	National Parks Board of W.A. (33)	11240/01
7.12.1934	1876	L.A.1933	Lands	2117/34
21. 1.1938	75	L.A.1933	Lands	30/38
18. 6.1937	991	L.A.1933	Lands	571/37
17. 3.1939	437	L.A.1933	Local Authority (33)	1078/04
29. 9.1939	1705	L.A.1933	Lands	11213/99 Vol. 2
19. 7.1940	1390	L.A.1933	Lands	4893/22
21. 3.1941	357	L.A.1933	Lands	10255/12
4. 7.1941	889	L.A.1933	Lands	1950/30
31.10.1941	1588	L.A.1933	Lands	335/40
13. 2.1942	184	L.A.1933	Lands	3056/22
26. 1.1945	87	L.A.1933	Lands	7133/13
11. 5.1945	443	L.A.1933	Lands	6064/28
11.10.1946	1264	L.A.1933	Local Authority (34)	4155/47
15. 8.1947	1466	L.A.1933	Lands	2827/14
29. 8.1947	1564	L.A.1933	Lands	2769/99
13. 2.1948	344	L.A.1933	Local Authority (34)	2905/46
19. 3.1948	640	L.A.1933		3792/25
21. 5.1948	1103	L.A.1933	Local Authority (34)	5996/47
21. 5.1948	1103	L.A.1933	Lands	4587/47

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
National Park	Narrogin	"A"	20605		71
Stock Route & Protection of Flora & Fauna	Swan	"C"	3446		228
Flora & Fauna	Swan	"C"	20801		5230
Scenic Reserve Indigenous Flora	Nelson	"C"	20810		142
National Park	Swan View	"A"	8164		11
National Park	Canning	"C"	21314		935
Protection of Timber & Flora	Avon (nr. Nangeenan)	"C"	21803		
Protection of Flora & Fauna	Swan (Malup Island)	"A"	21708		10
Picnic Grounds & Protection of Flora	Victoria	"A"	9106		100
Protection of Flora Boronia	Albany	"C"	22058		35
Protection of Flora	Avon	"C"	22176		10
Water and Protection of Native Game	Avon	"A"	9228		150
Protection of Flora & Fauna	Avon "Wundowlin Well"	"C"	22262		1826
Protection of Flora	Ninghan (Kondut)	"A"	22289		18
Protection of Flora	Cowcowing	"C"	22312		6
Flora & Fauna	Avon near Beyaberring	"C"	16129		10
Flora & Fauna	Ninghan	"C"	22457		258
Public Park & Protection of Native Flora	Kalamunda	"A"	22576		9
Protection of Native Fauna	Wellington	"C"	22682	5. 1.1951	100
Native Flora	Wellington	"C"	22690		5
Native Flora	Kulin	"C"	22739		34
National Park	Kalamunda	"C"	22768		20
Conservation of Flora	Kalamunda	"A"	22798		5
Flora & Fauna	Islands of Recherche Archipelago	"C"	22796		

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
21. 5.1948	1102	L.A.1933	Lands	4587/47
24. 9.1948	2279	L.A.1933	Lands	4537/48
15.10.1948	2496	L.A.1933 P.&R.1895	Local Authority (34)	4951/46
18. 2.1949	310	L.A.1933 P.&R.1895	Local Authority (33)	4112/94
25. 3.1949	625	L.A.1933	Lands	1120/17
25. 3.1949	624	L.A.1933	Lands	1120/17
29. 4.1949	894	L.A.1933	Lands	754/37
5. 8.1949	1890	L.A.1933	Lands	3835/49
14.10.1949	2468	L.A.1933 P.&R.1895	Local Authority (34)	8775/13
11.11.1949	2888	L.A.1933	Lands	4543/20 Vol. 2
25.11.1949	3018	L.A.1933	Lands	5647/48
25.11.1949	3018	L.A.1933	Lands	344/49
21. 4.1950	886	L.A.1933	Lands	5944/11
5. 5.1950	971	L.A.1933	Lands	6918/23
19. 5.1950	1144	L.A.1933	Lands	1742/50
16. 6.1950	1389	L.A.1933	Lands	10538/12
1. 9.1950	2037	L.A.1933	Local Authority (34)	4755/50
15. 9.1950	2106	L.A.1933	Lands	954/49
15. 9.1950	2106	L.A.1933	Lands	2517/25
2.10.1950	2246	L.A.1933	Lands	3988/30
3.11.1950	2463	L.A.1933	Lands	6268/20 Vol. 3
3.11.1950	2464	L.A.1933	Lands	4583/11
3.11.1950	2464	L.A.1933	Lands	6990/97
1.12.1950	2699	L.A.1933	Lands	4537/48
5. 1.1951	15	L.A.1933	Lands	987/91 Vol. 2
9. 2.1951	285	L.A.1933	Lands	8180/50
23. 2.1951	426	L.A.1933	Lands	1300/01
15. 6.1951	1673	L.A.1933	Lands	1940/51
15. 6.1951	1673	L.A.1933	Lands	2228/51
15. 6.1951	1673	L.A.1933	Lands	2800/49
17. 8.1951	2254	L.A.1933	Lands	1057/34
5.10.1951	2645	L.A.1933	Lands	503/44
5.10.1951	2645	L.A.1933	Lands	3100/51
5.10.1951	2645	L.A.1933	Lands	4643/51
5.10.1951	2646	L.A.1933	Lands	2310/09
14.12.1951	3404	L.A.1933	Lands	1262/25
21.12.1951	3454	L.A.1933	Lands	6096/51
6. 6.1952	1447	L.A.1933	Lands	1266/52

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
National Park	Esperance	"A"	22795		39500
Conservation of Flora	Hay	"C"	22841		190
Conservation of Flora	Avon	"C"	22850		12
Conservation of Flora	Plantagenet	"C"	22892		450
Conservation of Flora	Kondinin	"C"	22907		2
Conservation of Flora	Kondinin	"C"	22906		70
Conservation of Flora	Avon	"C"	22921		2545
Conservation of Flora	Kent	"C"	22966		100
Preservation of Flora	Yealering	"C"	22967		133
Fauna	Sussex	"C"	23006		260
Flora	Avon	"C"	23008		160
Flora	Mundijong	"C"	23012		70
Flora	Plantagenet	"C"	23068		96
National Park	Nelson	"C"	23077		18
Flora	Avon	"C"	23085		200
Flora	Avon	"C"	14510		400
Recreation Flora & Fauna	Roe	"C"	23128		300
Flora	Avon	"C"	23137		22
Flora	Avon	"C"	23141		150
National Park	Narrogin	"A"	23152		23
Flora & Fauna	Avon	"C"	23156		848
Flora	Avon	"C"	13797		89
Recreation & Flora	Williams	"C"	4458		240
Flora & Fauna	Hay	"C"	23171		1100
Flora & Fauna	Melbourne	"C"	23179		20
Flora & Fauna	Avon	"C"	23201		199
Flora & Stopping Place	Boyanup	"C"	7684		12
National Park	Nelson	"C"	23260		50
Flora & Fauna	Avon	"C"	23262		10
National Park	Nelson	"C"	23261		2
Flora & Fauna	Sussex	"C"	23286		216
Flora	Melbourne	"C"	23313		286
National Park	Wellington	"C"	23307		133
Flora & Fauna	Melbourne	"C"	23316		721
Flora	Avon	"A"	12098		88
National Park	Gascoyne	"A"	19145		130
Flora & Fauna	Avon	"C"	23366		832
Flora & Fauna	Kent (Doubtful Is. & Seal Rock)	"A"	23516		

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
6. 6.1952	1447	L.A.1933	Lands	1640/51
6. 6.1952	1447	L.A.1933	Lands	6923/25
27. 6.1952	1588	L.A.1933	Lands	4225/15
27. 6.1952	1589	L.A.1933	Lands	3576/04
8. 8.1952	1913	L.A.1933	Fauna Protection Advisory (33)	14965/08 Vol. 2
8. 8.1952	1913	L.A.1933	Local Authority (33)	181/41
29. 8.1952	2101	L.A.1933	Lands	9844/12
5. 9.1952	2048	L.A.1933	Lands	3934/09
19. 9.1952	2244	L.A.1933	Lands	2035/05
19. 9.1952	2244	L.A.1933	Lands	7035/51
19. 9.1952	2244	L.A.1933	Lands	3525/52
3.10.1952	2462	L.A.1933	Lands	1517/21
31.10.1952	2637	L.A.1933	Lands	6188/20
31.10.1952	2637	L.A.1933	Lands	1262/25
21.11.1952	2797	L.A.1933	Lands	3985/52
21.11.1952	2797	L.A.1933	Local Authority (33)	4422/52
5.12.1952	2868	L.A.1933	Lands	1122/17
31.12.1952	2997	L.A.1933	Lands	1910/22
31.12.1952	2997	L.A.1933	Lands	4440/52
31.12.1952	2997	L.A.1933	Lands	474/89
31.12.1952	2997	L.A.1933	Lands	1640/08
16. 1.1953	108	L.A.1933	Lands	465/51
20. 2.1953	381	L.A.1933	Local Authority (33)	7397/22
27. 3.1953	562	L.A.1933	Local Authority (43)	1918/05 6887/50
17. 4.1953	602	L.A.1933	Lands	7154/51
17. 4.1953	663	L.A.1933	Lands	4204/24
12. 6.1953	1174	L.A.1933	Lands	5783/52
12. 6.1953	5517	L.A.1933	Lands	846/30
12. 6.1953	1174	L.A.1933	Lands	2483/52
24. 7.1953	1420	L.A.1933	Lands	914/45
7. 8.1953	1487	L.A.1933 P.&R.1895	Local Authority	12867/10
11. 9.1953	1697	L.A.1933	Lands	1004/99
25. 9.1953	1890	L.A.1933	Lands	9924/07
2.10.1953	2030	L.A.1933	Lands	495/53
23.10.1953	2117	L.A.1933	Lands	4042/56
23.10.1953	2117	L.A.1933	Lands	2018/18

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
National Park	Greenmount	"C"	23537		27
Flora & Fauna	Avon	"C"	19476		224
Flora & Fauna	Avon	"C"	16412		115
Flora	Avon	"C"	11776		100
Flora & Fauna	Avon	"C"	23586		390
National Park	Avon	"A"	23580		2968
Native Flora	Kojonup	"C"	14450		48
National Park	Wellington	"C"	23597		1042
Flora	Victoria	"C"	23600		129
Flora	Victoria	"C"	23601		900
Flora	Victoria	"C"	23602		300
Flora	Ninghan	"C"	17778		40
National Park	Nelson	"C"	23630		280
National Park	Gascoyne	"A"	19144		120
Flora	Avon	"C"	23637		8
Flora	Kondinin	"C"	23641		15
Protection of Fauna	Avon (George Rock)	"A"	16714		68
Flora	Lake Grace	"C"	23670		4
Flora	Ninghan	"C"	23665		260
Stopping Place & Protection of Flora	Avon (Pingelly)	"C"	2023		100
Flora & Fauna	Avon	"C"	11320		9
Flora & Fauna	Avon	"C"	23686		1193
Flora & Fauna	Avon	"C"	23704		594
Flora	Kojonup	"C"	9774		100
National Park	Northcliffe	"C"	23740		490
Flora & Fauna	Avon	"C"	21286		150
Flora	Murray	"A"	23756		1937
Flora	Victoria	"C"	1017		1154
Flora	Avon	"C"	23758		673
Flora	Avon	"C"	23795		512
Flora	Avon (Quanta Cutting)	"C"	13052		178
Flora & Fauna	Avon	"C"	10183	23. 3.1956	160
Flora & Fauna Camping Ground Resting Place	Nelson	"A"	11290		354
Fauna, Protection of Game	Esperance	"C"	23825		4820
National Park	Hay (Kojonup)	"C"	2096		210
National Park	Williams	"A"	17125		50

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT FILE
11.12.1953	2439	L.A.1933	Lands	3063/50
8. 1.1954	8	L.A.1933	Local Authority (33)	1985/16
19. 2.1954	279	L.A.1933	Lands	2959/29
19. 3.1954	412	L.A.1933	Lands	3753/53
4. 6.1954	999	L.A.1933	Local Authority (33)	1600/54
4. 6.1954	999	L.A.1933	Local Authority (33)	1593/54 1594/54
4. 6.1954	999	L.A.1933	Local Authority (33)	1569/54
13. 8.1954	1396	L.A.1933	Lands	2761/54
13. 8.1954	2126	L.A.1933	Lands	1188/00
13. 8.1954	1396	L.A.1933	Lands	4888/14
20. 8.1954	1451	L.A.1933	Lands	482/07
24. 9.1954	1046	L.A.1933	Lands	2991/54
24. 9.1954	1646	L.A.1933	Lands	4787/53
24. 9.1954	1646	L.A.1933	Lands	2797/17
22.10.1954	1805	L.A.1933	Lands	3136/54
22.10.1954	1805	L.A.1933	Lands	3137/54
22.10.1954	1805	L.A.1933	Lands	3138/54
22.10.1954	1805	L.A.1933	Lands	3139/54
22.10.1954	1805	L.A.1933	Lands	4520/33
12.11.1954		L.A.1933	Local Authority (34)	5270/50
12.11.1954	1902	L.A.1933	Lands	4017/53
10.12.1954	2029	L.A.1933	Lands	3267/17
7. 1.1955	52	L.A.1933	Lands	4402/53
29. 1.1955	177	L.A.1933	Lands	1965/18
28. 1.1955	177	L.A.1933	Lands	3576/54
18. 2.1955	351	L.A.1933	Lands	6840/09
18. 2.1955	350	L.A.1933	Lands	851/43
18. 2.1955	350	L.A.1933	Lands	2647/37
24. 2.1955	615	L.A.1933	Fauna Protection Advisory Committee (33)	3735/55
1. 4.1955	615	L.A.1933	Local Authority (33)	14573/11

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
Flora	Avon	"C"	23856		29
Flora	Avon	"C"	23877		320
Flora (Boronia)	Wellington	"C"	23886		1620
Flora	Manjimup	"A"	23915		8
Flora & Children's Playground	Kwinana	"A"	23958		3
Flora & Nursery School	Kwinana	"A"	23960/1		5 & 4
Flora & Playground	Kwinana	"A"	23965		4
Flora	Kwolyin	"C"	11024		54
Flora	Avon (Tamerin)	"C"	4667		82
Flora & Fauna	Nelson	"C"	15762		211
Flora	Avon	"C"	10716	8. 4.1961	588
Flora	Gascoyne	"C"	23045		6
Timber & Flora	Gascoyne	"C"	24053		9
Flora & Fauna	Murray	"C"	24036		895
Flora & Fauna	Neridup & Mardanbilla	"C"	24047		642,000
Flora & Fauna	Kent & Oldfield (Bremer Bay)	"C"	24048		604,300
Flora & Fauna	Jilbadji Leake & Ngallain	"C"	24049		516,240
Flora & Fauna	Victoria & Murchison	"C"	24050		213,000
Flora	Ninghan	"C"	24060		90
Flora	Avon	"C"	23138		504
Flora	Kojonup	"C"	24072		80
Protection of Flora	Avon (Elabbin)	"C"	16932		1474
Flora & Fauna	Avon	"C"	24097		30
Flora & Fauna	Avon (Nth. Kulin)	"C"	17296		5
Flora & Fauna	Kojonup	"C"	24117		12
Flora	Williams	"C"	13063		100
Flora	Avon	"C"	24125		877
Flora	Swan	"C"	24129		214
Fauna	Williams	"C"	24373		780
Flora, Trout Fishing & Swimming	Avon	"A"	833		105

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
22. 4.1955	754	L.A.1933	Local Authority (34)	2860/15
10. 6.1955	1332	L.A.1933	Lands	1645/26
8. 7.1955	1656	L.A.1933	Lands	4573/51
8. 7.1955	1656	L.A.1933	Fauna Protection Advisory Committee (33)	929/28
9. 9.1955	2168	L.A.1933	Lands	2474/55
9. 9.1955	2168	L.A.1933	Lands	2269/55
23. 9.1955	2459	L.A.1933	Lands	1220/34
25.11.1955	2879	L.A.1933	Lands	4592/46
25.11.1955	2880	L.A.1933	Fauna Protection Advisory Committee (33)	11958/06
13. 1.1956	107	L.A.1933	Lands	4133/55
24. 2.1956	615	L.A.1933	Lands	5290/51
24. 2.1956	615		Lands	6141/50
29. 3.1956	903	L.A.1933	Lands	3743/46
29. 3.1956	913	L.A.1933	Lands	
13. 4.1956	1012	L.A.1933	Lands	4616/29
20. 4.1956	1092	L.A.1933	Lands	5236/98 Vol. 2
20. 4.1956	1092	L.A.1933	Lands	9721/05
20. 4.1956	1091	L.A.1933 - P.&R.1895	National Parks Board of W.A. (33)	6782/14
20. 4.1956	1012	L.A.1933 P.&R.1895	National Parks Board of W.A. (33)	3637/55
20. 4.1956	1012	L.A.1933	Lands	2710/35
11. 5.1956	1191	L.A.1933	Lands	671/42
11. 5.1956	1191	L.A.1933	Lands	4580/51
11. 5.1956	1191	L.A.1933	Fauna Protection Advisory Committee (33)	3177/48
11. 5.1956	1191	L.A.1933	Lands	546/44
6. 7.1956	1674	L.A.1933	Local Authority (33)	240/43
6. 7.1956	1674	L.A.1933	Local Authority(34)	441/41
6. 7.1956	1674	L.A.1933	Lands	5153/48
6. 7.1956	1676	L.A.1933	P.W.D.(42)	5699/97
6. 7.1956	1674	L.A.1933	Lands	2531/54

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
Flora & Fauna	Avon	"C"	16265		9
Flora	Avon	"C"	24179		29
Flora & National Park	Melbourne	"C"	24229		4037
Fauna	Point Peron	"C"	24204		8
Fauna	Lake Bambun Lake Yambung Lake Mungala (Swan)	"C"	24257		202
National Park & Recreation	Plantagenet (Albany)	"A"	24258		9043
Flora	Roe	"C"	21253		8230
Flora	Victoria	"C"	24325		7
Flora & Fauna	Brooklyn	"C"	12398		822
Flora	Kojonup	"C"	1703		20
Flora & Fauna	Avon	"C"	24367		2016
Flora	Avon	"C"	24370		60
National Park	Walyungup Lake	"A"	23780		734
National Park	Ashburton Peawah De Witt	"A"	24392		1090
Flora	Roe	"C"	24417		1135
Flora	Murray	"C"	24430		7
Fauna	Avon	"C"	24428		800
Flora	Swan (Yeal Swamp)	"C"	15997		160
Flora	Swan	"C"	24436		279
Flora	Lake King	"A"	24435		229
Flora	Dumberning	"C"	24443		4
Flora	Melbourne	"C"	24450		7173
Flora & Fauna	Windell	"C"	24438		74000
Flora & Fauna	Avon	"C"	24439		5
Flora & Fauna	Wellington	"C"	24472		100
Flora	Esperance	"C"	24486		29000
Flora	Victoria	"C"	24496		174,450
Water & Fauna	Kalgoorlie	"C"	4274		1000
Flora	Melbourne & Victoria	"C"	24491		65488

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
3. 8.1956	1952	L.A.1933	Lands	8156/07
3. 8.1956	1952	L.A.1933	Lands	2726/96
3. 8.1956	1951	L.A.1933	Lands	2699/29
31. 8.1956	2187	L.A.1933	Lands	1875/98
31. 8.1956	2186	L.A.1933	Lands	4106/29
31. 8.1956	2186	L.A.1933	Lands	2208/55
31. 8.1956	2186	L.A.1933	Lands	2628/56
14. 9.1956	2306	L.A.1933	Lands	2777/56
12.10.1956	2487	L.A.1933	Lands	4598/22
12.10.1956	2487	L.A.1933	Fauna Protection Advisory Committee (33)	1291/56
9.11.1956	2638	L.A.1933	Lands	5257/19
23.11.1956		L.A.1933	Lands	3432/56 2584/59
9.11.1956	2637	L.A.1933	Lands	2494/54
2.11.1956	2602	L.A.1933	Lands	4061/99
11. 1.1957	30	L.A.1933	Lands	1913/55
11. 1.1957	31	L.A.1933	Lands	4791/13
15. 2.1957	341	L.A.1933	Lands	2673/22
5. 4.1957	1029	L.A.1933	Lands	4326/95
12. 4.1957	1090	L.A.1933	Lands	3139/54
24. 5.1957	1501	L.A.1933	Lands	2271/55
24. 5.1957	1501	L.A.1933	Local Authority (33)	527/57
21. 6.1957	1993	L.A.1933	Lands	3049/95
19. 7.1957	2371	L.A.1933	Lands	1839/57
19. 7.1957	1292	L.A.1933	Lands	6259/03
2. 8.1957	2371	L.A.1933	Local Authority (33)	2690/57
16. 8.1957	2468	L.A.1933	Lands	4110/55
16. 8.1957		L.A.1933	Fauna Protection Advisory Committee (33)	2159/57
6. 9.1957	2654	L.A.1933	Lands	1098/47
11.10.1957	2443	L.A.1933	Lands	3577/04
25.10.1975	2975	L.A.1933	Lands	12616/98
25.10.1957	2976	L.A.1933	Lands	8553/13
22.11.1957	3413	L.A.1933	Lands	3689/54
6.12.1957	3513	L.A.1933	Fauna Protection Advisory Committee (33)	2043/58
20.12.1957	3641	L.A.1933	Lands	4189/57
17. 1.1958	93	L.A.1933	Lands	1254/57
21. 2.1958	341	L.A.1933	Lands	4830/19

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
Flora	Kwolyin	"A"	24505		435
Flora	Esperance	"C"	24511		330
Flora	Avon	"C"	24507		1985
Flora	Avon (Toodyay)	"C"	4668		57
Flora	Nangeenan	"C"	24532		95
Caves & National Park	Melbourne	"A"	24522		10945
Flora	Ninghan	"C"	24534		823
Flora	Ninghan	"C"	24539		400
Flora	Avon	"C"	24554		11
Flora	Williams	"A"	24556		585
Flora	Avon	"C"	976		144
Fauna	Kojonup	"C"	24599		500
Flora	Kojonup	"C"	24589		3700
Sanctuary for Fauna	Swan	"A"	24581		288
Flora	Victoria	"C"	24618		4999
Conservation of Flora & Fauna & Drainage	Cockburn Sound	"C"	15556		2044
Flora & Fauna	Yilgarn	"C"	18199		420
Flora	East Beverly	"A"	3218		9
Flora	Victoria & Murchison	"C"	24686		145,000
Flora	Kojonup	"A"	24707		26
Flora	Nelson	"A"	24715		20
Flora & Fauna	Murray	"A"	24739		100
Flora	Kojonup	"C"	24770		289
Flora	Williams	"C"	24746		41
Flora	Bruce Rock	"C"	24758		1
Flora	Williams	"C"	24792		758
Flora & Fauna Recreation	Forrestdale	"A"	24781		602
Flora	Avon	"C"	24789		1700
Flora	Kojonup	"C"	24827		119
Flora	Avon	"C"	24831		88
Flora	Williams	"A"	15197		120
Flora	Avon	"C"	24838		595
Fauna	Gascoyne (Bernier & Dorre Is.)	"A"	24869		26000
Flora	Avon	"C"	24885		15
Flora	Avon	"C"	24897		877
Flora	Kojonup	"C"	24912		70

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
23. 3.1958	530	L.A.1933	Fauna Protection Advisory Committee (33)	2876/33
28. 3.1958	585	L.A.1933	Lands	2266/55
28. 3.1958	585	L.A.1933	Lands	1946/57
11. 4.1958	675	L.A.1933	Lands	4505/57
16. 5.1958	997	L.A.1933	Lands	981/58
25. 5.1958	1053	L.A.1933	Lands	7945/08
20. 6.1958	1310	L.A.1933	Lands	11139/97
20. 6.1958	1309	L.A.1933	Fauna Protection Advisory Committee (33)	1346/36
20. 6.1958	1309	L.A.1933	Lands	1385/58
8. 7.1958	1496	L.A.1933	Lands	3923/88
11. 7.1958	1495	L.A.1933	Lands	1012/17
25. 7.1958	1654	L.A.1933	Lands	804/58
8. 8.1958	1947	L.A.1933	Lands	1353/20
22. 8.1958	2230	L.A.1933	Lands	935/97
22. 8.1958	2230	L.A.1933	Lands	935/97
5. 9.1958	2327	L.A.1933	Local Authority (33)	799/55
3.10.1958	2539	L.A.1933	Fauna Protection Advisory Committee (33)	6598/25
3.10.1958	2539	L.A.1933 P.&R.1895		4250/57
5.12.1958	3166	L.A.1933 P.&R.1895		4083/29
5.12.1958	3167	L.A.1933 P.&R.1895	Local Authority (33)	3194/93 3196/93
19.12.1958	3291	L.A.1933	Fauna Protection Advisory Committee (33)	438/57
19.12.1958	3290	L.A.1933	Lands	3440/60
3. 4.1959	856	L.A.1933	Lands	1511/40
3. 4.1959	856	L.A.1933	Fauna Protection Advisory Committee (33)	3271/13
5. 6.1959	1473	L.A.1933	Lands	2229/15
12. 6.1959	1562	L.A.1933	Fauna Protection Advisory Committee (33)	408/44
16. 7.1959	1268	L.A.1933	Lands	611/13
31. 7.1959	1979	L.A.1933	Lands	3811/58
9.10.1959	2528	L.A.1933	Fauna Protection Advisory Committee (33)	3592/96

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
Fauna	Wellington	"C"	24917		400
Flora	Esperance	"C"	24953		100
Flora	Plantagenet	"A"	24943		10
Flora & Fauna	Lancelin & Edward Is.	"C"	24979		20
Water & National Park	Plantagenet	"A"	24991		735
Flora	Avon	"C"	24835		175
Public Utility Flora & Fauna	Murray	"C"	2707		252
Flora & Fauna	Sandy Is.	"A"	25027		32
Flora	Muradup	"C"	25013		1
Water, Flora & Fauna	Yilgarn	"C"	1432		2000
Flora	Emu Hill	"A"	25039		220
Flora	Plantagenet	"A"	619		120
Flora	Avon	"A"	25062		734
Flora	Geraldton	"C"	4102		6
Flora	Geraldton	"C"	4103		14
Flora & Fauna	Williams	"A"	25114		193
Flora & Fauna	Williams	"A"	25133/ 4/5/6		9172
Flora	Kwolyin	"C"	25112		237
Flora & Fauna	Plantagenet	"C"	25194		1280
Water, Public Utility & Flora	Melbourne	"A"	2736		620
Recreation & Flora & Fauna	Victoria	"C"	25210		4180
Flora	Kent	"A"	25212		107
Flora	Williams	"C"	25310	2.12.1960	652
Water & Flora & Fauna	Plantagenet	"A"	15107		500
Flora	Cowcowing	"C"	16040		459
Water & Flora & Fauna	Katanning	"A"	22442		100
Flora	Kojonup	"C"	15061		40
Flora	Plantagenet	"A"	25386		814
Flora & Fauna	Nelson	"A"	25446		92

GOVERNMENT GAZETTE:

DATE	PAGE	ACT CREATING RESERVE	CONTROLLING AUTHORITY	LANDS DEPT. FILE
12. 2.1960	354	L.A.1933	Lands	2813/59
12. 2.1960	354	L.A.1933	Lands	891/59
12. 2.1960	354	L.A.1933	Fauna Protection Advisory Committee (33)	2659/59
12. 2.1960	354	L.A.1933	Lands	2156/59
4. 3.1960	596	L.A.1933	Lands	3916/55
4. 3.1960	596	L.A.1933	Lands	1741/58
27. 5.1960	1445	L.A.1933	Fauna Protection Advisory Committee (33)	3980/59
27. 5.1960	1445	L.A.1933	Fauna Protection Advisory Committee (33)	3980/59
24. 6.1960	1786	L.A.1933	Lands	5936/20
24. 6.1960	1787	L.A.1933	Fauna Protection Advisory Committee (33)	1900/05
24. 6.1960	1787	L.A.1933	Fauna Protection Advisory Committee (33)	12295/05
8. 7.1960	2032	L.A.1933	Lands	1123/100
8. 7.1960	2032	L.A.1933	Lands	1125/60
15. 7.1960	2124	L.A.1933	Lands	1632/60
29. 7.1960	2312	L.A.1933	Lands	599/57
29. 7.1960	2312	L.A.1933	Lands	4142/57
15. 9.1960	2106	L.A.1933	Lands	2517/25
2.12.1960	3868	L.A.1933	Fauna Protection Advisory Committee (33)	2454/37
2.12.1960	3861	L.A.1933	Fauna Protection Advisory Committee (33)	1153/59
2.12.1960	3867	L.A.1933	Lands	2454/60
2.12.1960	3868	L.A.1933	Lands	943/60
16.12.1960	3980	L.A.1933	Lands	2957/60
16.12.1960	3980	L.A.1933	Lands	3451/60
16.12.1960	3974	L.A.1933 Advisory	Fauna Protection Advisory Committee (33)	1716/26
3. 3.1961	621	L.A.1933	Lands	4048/50
3. 3.1961	621	L.A.1933	Lands	2900/59
17. 3.1961	701	L.A.1933	Lands	1469/46
17. 3.1961	702	L.A.1933	Lands	2331/45
30. 3.1961	843	L.A.1933	Lands	4644/49
14. 4.1961	919	L.A.1933	Lands	6041/51

PURPOSE	SITUATION	CLASS	NO.	DATE CANCELLED	APPROXIMATE AREA IN ACRES AS AT 1961.
Flora	Yilgarn	"C"	25535		85
Flora	Plantagenet	"C"	25545		2
Fauna	Pingelly	"C"	25555		3260
Flora	Corrigin	"C"	25546		40
Flora	Plantagenet	"C"	25583		128
Flora	Victoria Plains	"C"	25579		3
Fauna	Sussex (Seal Is.)	"A"	25645		10
Fauna	Sussex (St. Alouarn Is.)	"A"	25646		21
Flora & Timber	Kondinin	"C"	25681		4012
Fauna	Avon	"C"	9714		10
Fauna	Avon	"C"	10142		20
Flora	Kojonup	"C"	25697		40
Flora	Kojonup	"C"	25696		17
National Park	Plantagenet	"C"	25705		142
Flora	Wickepin	"C"	25708		591
Flora	Dumbleyung	"A"	25711		4977
Flora	Avon	"C"	23141		150
Flora & Fauna	Yilgarn	"C"	25801		1782
Flora & Fauna	Nelson	"A"	25798		7000
Ecological Purposes and Conservation of Flora	Melbourne	"C"	25808		494
Flora & Fauna	Plantagenet	"C"	25809		458
Flora & Fauna	Plantagenet	"A"	25812		272
Flora	Swan	"C"	25813		2
Water, Flora and Fauna	Yilgarn	"C"	19210		6523
Flora & Fauna	Bald Is.	"C"	25869		2000
Flora	Avon	"C"	25872		1089
Flora	Swan	"C"	25876		639
Flora	Avon	"C"	25884		2141
Flora	Peel Estate	"C"	25886		354
Flora	Denmark (East)	"C"	23325		58

CHAPTER 4

Current State Legislation Relating to the Setting Aside, Protection against Alienation and Management of Nature Reserves in Western Australia

I. INTRODUCTION

The State legislation which affects Nature Reserves in Western Australia falls into two main categories. There are those Acts which allow the Government to set aside reserves for public purposes, which give them varying degrees of permanence, and which make provision for their control and management so that they may fulfil the purpose for which they have been set aside. And there are other Acts which, however well designed they are for the purposes which they serve, contain sections which permit land or water to be taken from reserves and used for certain other specified purposes (e.g. mining, forestry, etc.).

Thus, in even the best protected reserves, absolute legal security does not exist, but the machinery involved in alienation of reserves is such that the holders of reserves and the opinion of the general public can do much to reduce the risks inherent in the laws.

This account is an attempt to show how these Acts are interrelated and thus to indicate the varying degrees of security of public reserves.

On first reading through the Acts, the reader gains the impression that, no matter how well intent-

ioned the provisions of the Land Act are insofar as they relate to reserves, from certain points of view fauna and flora reserves have very little real security. However, large numbers of reserves have been created in Western Australia for the preservation of the natural environment and the number of these which have been alienated is surprisingly small. It is clear that this is partly due to the fact that there is a large quantity of land in the State while the population is still small. Nevertheless, it is likely that the real reason for the security which reserves have enjoyed, despite the very great pressure of local interests upon Governments and departments to alienate them, is the attitude of the officials of the Lands Department who, over the years, have built a tradition favourable to reserves. Another factor of utmost importance is the power which the Land Act gives to the Government to vest reserves in corporate bodies who hold them in fee simple. These corporate bodies (e.g. the Fauna Protection Advisory Committee, King's Park Board, etc.) are not Government Departments and have every opportunity to discourage action from being taken which would be detrimental to the reserves which they control.

If, as the outcome of this survey, it is concluded that a comprehensive system of major reserves (i.e. National Parks in the full sense) would require a greater degree of legal protection than even that given under the Land Act to Class A Reserves, it is clear that provision should be introduced into the Land Act (or the Forests and Mining Acts) so that the protection afforded to Class A Reserves shall not be affected by any other State legislation relating to the use, alienation and development of land in Western Australia. Such reserves would for ever remain dedicated to the purpose for which they were set aside, unless specifically altered by the wish of the people as expressed in Parliament.

No attempt has been made in this survey to compare interaction between the Commonwealth Constitution and State and Commonwealth legislation.

II. LEGISLATION WHICH SETS UP RESERVES AND GIVES POWER TO BOARDS AND INDIVIDUALS TO CONTROL THEM

The Land Act, 1933-1963.

In Western Australia, reserves are set up by and primarily derive their protection from the Land Act. However, this Act expressly states (Section 4(2)) that the provisions of the Land Act do not affect the operation of the Mining Act, the Forests Act, the Discharged Soldiers' Settlement Act, the Group Settlement Act, or the Closer Settlement Act.[1] In addition, certain other Acts (e.g. the Public Works Act) contain provisions which nullify the protection afforded by the Land Act in certain specified cases. The effect of these Acts is considered later.

The Land Act gives different degrees of protection against alienation to different classes of reserves. Thus:

Reserves may be vested in a local authority, body corporate or other person, in fee simple. The vesting order must specify the purpose for which the land is reserved, and the name of the body in which it is vested. Where the order gives power to lease or sub-lease, it must also specify the conditions and limitations under which the invested authority may lease (Section 33(1)).

As an alternative to vesting the reserve in a body, the Governor may merely place it under the control of that body (Section 34(1)), or the Crown may continue to control the reserve.

If a reserve has been vested, the Governor may, subsequent to the initial order, give power to the in-

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[1] There is no need to be concerned in this connection with the Discharged Soldiers' Settlement Act, the Group Settlement Act, or the Closer Settlement Act as none of these Acts now has any application to Reserves. The Mining Act and the Forests Act are special cases which are discussed later.

vested authority to grant leases[2] (Section 33(2)) and if at the time a reserve is made, and in the opinion of the Governor it is not immediately needed for the purpose for which it is reserved, then it may be leased (Section 32(1)).

When land is reserved for the purpose of parks or for recreation or amusement but is not vested in, granted in fee simple to, or placed under the control and management of any person, the Governor may, notwithstanding that the land is being used for the purpose for which it is reserved, grant a lease or licence thereof to any person for the term of one year for the purpose of depasturing stock on the land (Section 32(2)). Such leases may be renewed for further periods of a year (Section 32(3)). The Governor may insert in the lease or licence terms which will ensure that the land is available, during the currency of the lease or licence, for the purpose for which it is reserved. It is to be noted that these powers are conferred only in respect of parks and reserves for recreation and amusement. They do not extend, for example, to reserves for the preservation of flora and fauna.

Reserves are classified as being Class A, Class B, Class C (Section 31) or they may be Temporary Reserves (Section 36).

Class A Reserves.

Class A Reserves are proclaimed by the Governor and "shall for ever remain dedicated to the purpose declared in such proclamation, until by an Act of Parliament in which such lands are specified it is otherwise enacted" (Section 31(1)).

However, roads and streets[3] may be declared through a Class A Reserve and, if such a reserve is established in unsurveyed lands, the boundaries may be amended upon survey although not so as to cause a reduction in the area of the reserve by more than one twentieth (Section 31

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[2]It would appear from this (and Section 31(1)) that leases could only be granted in Class A Reserves provided that the lessees use their leases for the purpose for which the reserve was dedicated.

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[3]See section on Local Government Act.

(4)). Furthermore, there are to be borne in mind the Acts exempted from the operation of the Land Act by Section 4(2) viz. the Forests, Mining, Discharged Soldiers' Settlement, Closer Settlement, and Group Settlement Acts (see p.82).

The Authority or person controlling a Class A Reserve has power to make by-laws which are required to be published in the Gazette. (Section 34).

Class B Reserves.

Class B Reserves are so classified by the Governor and they may be cancelled by publication of cancellation in the Gazette. Reasons for the cancellation and the purpose to which it is intended to devote the land must be given to both Houses of Parliament within fourteen days of such cancellation. Should Parliament not be in session, these reasons must be given within fourteen days following the commencement of the next session. (Section 31(2)).

The purpose for which a Class B Reserve is made may be changed, and its boundaries may be cancelled or amended by the Governor. Notice of such action is to be published in the Gazette. (Section 37).

Roads and streets may be declared through a Class B Reserve and, if such a reserve is established in unsurveyed lands, the boundaries may be amended upon survey although not so as to cause a reduction in the area of the reserve by more than one twentieth. (Section 31(4)). These reserves may also be alienated by virtue of Section 4(2) exempting the Forests, Mining, Discharged Soldiers' Settlement, Closer Settlement, and Group Settlement Acts. (See p.82 for the operation of the Act).

The Authority or person controlling a Class B Reserve has power to make by-laws which are required to be published in the Gazette. (Section 34).

Class C Reserves.

All other classified reserves are Class C Reserves. (Section 31(3)).

The boundaries of a Class C Reserve may be cancelled or amended and its purpose may be changed by

the Governor. Notice of such action is to be published in the Gazette. (Section 37).

Roads and streets may be declared through a Class C Reserve and, if such a reserve is established in unsurveyed lands, the boundaries may be amended upon survey although not so as to cause a reduction in the area of the reserve by more than one twentieth. (Section 31 (4)). These reserves may also be alienated by virtue of Section 4(2) (see p.82).

The Authority or person controlling a Class C Reserve has power to make by-laws which are required to be published in the Gazette. (Section 34).

Temporary Reserves.

Temporary Reserves may be made by the Minister for Lands. If such a reserve is not made permanent by the Governor within twelve months it shall cease to be a reserve. (Section 36).

Parks and Reserves Act 1895-1963.

This Act provides for the appointment of Boards for the control and management of parks and reserves vested in the Crown. It designates the powers of these Boards to carry out works within the reserves and also designates the manner in which the Boards are to conduct their business in relation to their finance, staff, etc.

The Act empowers Boards to make by-laws for the management and conservation of parklands and reserves. The by-laws are required to be published in the Gazette.

Fauna Protection Act, 1950-1954.

The Fauna Protection Act is primarily designed to give protection to certain species of vertebrate animals. It sets up a Fauna Protection Advisory Committee consisting of six members including the Chief Warden of Fauna as Chairman. The Committee is constituted a body corporated and may control reserves or have them vested in it under the Land Act. These reserves are usually for the protection of fauna and flora.

This Act does not give protection to all fauna or flora but merely blanket protection to all "protected"

fauna. Fauna which has been declared unprotected (Section 14) receives protection on reserves through the action of controlling authorities (e.g. the Fauna Protection Advisory Committee) who may make by-laws (under the Parks and Reserves Act) limiting or prohibiting the use of guns, traps, etc., and through Section 28 of the Act which empowers the Governor to make regulations providing for the protection of fauna in sanctuaries.

Regulation 18(3) of the Regulations made under this Act (Government Gazette No. 61 of 13 June 1952) provides that "no person shall, except under the authority of the said [Fauna Protection Advisory] Committee, operate or discharge any firearm or throw or discharge any stone on any part of a sanctuary". Regulations made under the Act apply to all fauna reserves whether or not they are under the control of the Committee. The Act, and of course all Regulations thereunder, is subordinated to the provisions of the Fisheries Act, the Vermin Act, the Whaling Act and the Zoological Gardens Act. (Section 5).

The Fauna Protection Act does not confer power to make Regulations relating to the use and flow and control of natural waters situated in irrigation districts or which are required for irrigation or which are brought under the Rights in Water and Irrigation Act by proclamation. However, where the stream does not come under the Rights in Water and Irrigation Act regulations could validly be made under the Fauna Protection Act.

The Fauna Protection Act Section 13 provides that the Minister may enter into an agreement with the owner of areas of land for the use of that land as a sanctuary for the conservation and protection of fauna. Section 6 defines "sanctuary" as "an area of land (a) vested in the Crown and which the Governor subject to such conditions and limitations as he thinks fit reserves to Her Majesty or disposes of in such manner as for the public interest may seem fit for the conservation of fauna pursuant to the provisions of paragraph (g) of Section 29 of the Land Act 1933 (which merely gives the power to create this type of reserve), or (b) which is the subject of an agreement made between the Minister and the owner of the land for its use as a sanctuary". The Act does not in itself really confer any greater protection upon fauna in sanctuaries than elsewhere — but see with regard to natives, Section 23(1). The Governor is, however, empowered to make regulations under Section 28(a) for the protection of fauna in sanct-

uaries, and for the control of sanctuaries. Regulations to this effect were made in 1952.

Native Flora Protection Act, 1935-1938.

This Act is not concerned with the destruction of the environment of flora but it adds to the general effectiveness of Crown Lands as Reserves for Native Flora and it may provide protection to individual species.

The Act gives power to the Governor to specify any part of the State wherein the picking of any specific wildflowers or native plants is totally prohibited. Further it makes it an offence to destroy or mutilate (so as to eventually destroy) any native plant mentioned in the list of protected species on any Crown Lands or State Forest, or any lands reserved for public purposes under the Land Act, or any other Acts, or belonging to or vested in any statutory body, or on any road. The Act does not apply to private land when the picking or destruction is done by or with the consent of the owner lessee or licensee.

By proclamation gazetted on the 16th August, 1963, all wildflowers became protected in Western Australia on -

(a) All Crown Lands, State Forests, lands reserved for a public purpose under the provisions of the Land Act, 1933, or any other Act and every road within the South-west and Eucla Divisions of the State within the meaning of the Land Act, 1933.

(b) All parts of the State outside the said Divisions that are reserved under the provisions of the Land Act, 1933, for the protection of indigenous flora or fauna.

III. ACTS WHICH GIVE POWER TO AUTHORITIES TO ALIENATE LAND AND WATER IN RESERVES

Public Works Act, 1902-1961.

The Minister for Public Works is empowered by the Act to impound, divert and take water from any stream, pool, tank or reservoir of water, or may purchase or acquire any

right or interest therein for the purpose of supplying water for the use of any public work, whether that public work is situated on land entitled to the use of the water or not. (Section 13(1)).

Before land is taken for a public work, notice of that intention must be published in the Government Gazette and a copy of the notice is to be published in one issue of a newspaper circulating in the district in which the land is situated. Objections may be lodged within 30 days. If the Minister rejects the objections the public works are then proceeded with. (Section 17).

The Act (Section 20) provides that subject to the provisions of the Permanent Reserves Act, 1899, where any land at the date of publication of a notice of intention to resume it is a "public reserve" the effects of such publication shall be to cancel any dedication or reservation of the land and to revest the land in the Crown. The reference to the Permanent Reserves Act, 1899 must now be taken as a reference to the Land Act, 1933-1962 and the Section must therefore be read in accordance with that Act. The result is that Section 20 cannot apply to a Class A Reserve, which requires an Act of Parliament to permit its resumption. Furthermore, notice of cancellation of a Class B Reserve must still be given to Parliament. In the case of a Class C Reserve some protection is given by the usual publication of notice of intention to resume before the final resumption is made.

If further land is required for the public work, it may be taken in the same manner. (Section 28).

The Minister for Public Works, the Minister for Lands, or any local authority, or any person authorised either specially or generally by either Minister or by the local authority may enter upon any land to make surveys, take soil borings, and test for water (Sections 82, 83). The Minister for Public Works may construct or repair any road within any part of the State. (Section 86).

The Minister for Public Works or the local authority may deepen, widen, straighten and otherwise improve any river and may, remove from any river, stream, or watercourse, any earth or stone and all weeds, refuse and other growth and all driftwood, logs, trees, branches and other timber which may be lodged in the bed, or against the banks, and which is calculated to impede the

free flow of water in its natural or improved channel and may dispose of the same respectively towards recouping the cost of removal. For these purposes the Minister and every local authority has the right of free ingress or egress and regress on any land on the banks of any such river, stream or watercourse. (Section 93).

The Governor may (after the passing of a special Act authorising the building of a railway) by notice in the Government Gazette, take any land required for the railway (Section 97). By Section 98 where a railway is to be constructed on a Public Reserve and no definite area or part is taken it is deemed that a width of two chains has been set apart or taken for the purpose of the railway.

The Minister for Railways may temporarily occupy and use any land for the purpose of constructing or repairing a railway, and the Minister for Works may temporarily use and occupy and land for the purpose of constructing or repairing any other public work. For these purposes the Ministers may do the following:

(a) take therefrom stone, gravel, earth and other material;

(b) deposit thereon any such materials;

(c) form and use temporary roads thereon;

(d) manufacture bricks or other materials thereon;

(e) erect workshops, sheds, and other buildings of a temporary nature thereon.

When it is necessary and is intended to take land for a public work the Minister may deal with it in all respects as if the land intended to be taken had in fact been taken. (Section 112).

Forests Act, 1918-1954.

The Governor, subject to the consent of Parliament, may under the Public Works Act, 1902-1961 purchase, acquire, resume or appropriate land for the purpose of a State Forest or to provide access thereto. (Section 22).

The provisions in the Land Act which set aside

Reserves as being inviolate do not apply if they contain forests subsequently required for the purposes of the Forests Act. The Land Act (Section 4(2)) states that nothing in it "shall affect, or be construed to derogate from the operation of ... the Forests Act ...".

State Forests cannot be considered as being secure reserves for the preservation of indigenous flora and fauna since the Forests Act specifically states that the Conservator shall prepare working plans for each State Forest which may specify sylvicultural operations necessary to assure the regeneration of the best[4] species of forest produce on areas which have been cut over (Section 31(3)(c)).

The best species of forest produce may not be the indigenous forest produce of the areas. ("Forest produce" in the Forests Act does not only mean and include trees and their products but other vegetation, stone and earth, 'shells, indigenous animals and birds (not being game within the meaning of the Game Act, 1912-13) [see now Fauna Protection Act, 1950-1954], honey, and beeswax' (Section 4)"). Licences for the taking and sale of forest produce on Crown Land within a State Forest may be issued by any forest officer acting with the authority of the Conservator (Section 32). Such a permit may confer upon the holder the right to graze and water cattle in a State Forest (Section 33).

An additional barrier to State Forests being considered secure reserves is the provision that the Con-

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[4] Practices based on present forest policy ensure that widespread destruction of faunal habitats does not occur on State Forest. While the Conservator is empowered to take such action as is necessary to assure the regeneration of the best species, there are no grounds to assume that over the greater part of the forest area these will be other than the established indigenous species. Present sylvicultural practices are directed to their perpetuation, although selected areas are being planted with exotic pines to meet the State's softwood needs. The present programme of 2,000-2,500 acres per annum represents about one twentieth of one percent and the ultimate target of 200,000 acres of exotics would represent less than five percent of the total forest area of the State.

servator may, with the approval of the Minister, grant on such conditions as he thinks fit, and for any term not exceeding twenty years, leases of land within a State Forest, for grazing, agriculture, and other purposes not opposed to the interests of forestry (Section 40).[5]

The Act gives the Forests Department certain powers of control in parks and reserves. The Governor on the recommendation of the Conservator of Forests may make regulations for the protection of trees in parks and reserves under the control and management of a Board under the Parks and Reserves Act, 1895-1955; and for regulating, restricting, or prohibiting the cutting or removal of such trees and other forest produce (Section 43(8)). Subject to the provisions of the Fauna Protection Act, 1950-1954 he may also make regulations regulating or prohibiting the destruction, shooting, hunting, pursuing or snaring of indigenous animals and birds (Section 43(35)).

Although the destruction of natural habitat and of individual animals can be brought about by the action of the Forests authorities[6], the Act makes provision for the protection of individual animals and plants against unauthorised interference. Any person in any State Forest, except in pursuance of a permit licence or forest lease under this Act, commits an offence if he pastures any

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5 The proviso that the purposes for which forest may be leased be not opposed to the interests of forestry is a significant one. Grazing of stock is frequently found to be incompatible with effective forest management and stock are therefore excluded from the greater part of the prime forest. A large proportion of State Forest is water catchment and water purity considerations also require the exclusion of grazing and agriculture.

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6 At present, with grazing of domestic animals excluded from the greater part of the State Forests, sylvicultural practices directed towards the perpetuation of indigenous forest species, and with annual controlled burning of selected portions providing graded under-storey succession for indigenous fauna, there is every reason to believe that adequate habitats will be maintained for this fauna.

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cattle; hunts, shoots or destroys or sets snares for the purpose of capturing any indigenous animals or birds; or occupies, clears, or breaks up any land for cultivation, or any other purpose (Section 49) and similarly, an offence is committed by anyone who receives any forest produce, knowing the same to have been unlawfully obtained (Section 54). The Act also gives the Conservator of Forests the control of the cutting and removal of forest produce (see definition above) in any park or reserve nominated by the Governor (under Section 68) by notice in the Gazette. The Boards controlling parks or reserves to which this section has been applied require approval in writing of the Conservator of Forests before they can grant licences to cut or remove such plants and animals coming within the definition of forest produce.

Mining Act, 1904-1963.

The Mining Act makes it clear that mineral leases, claims, etc., can be obtained for the mining of Crown Lands including reserves. Further, the Land Act specifically states that nothing in it "shall affect, or be construed to derogate from the operation of the Mining Act ...". (Land Act, Section 4(2)).7

The Governor is specifically empowered to give permission to the holders of Miners Rights to mine and construct drives in a reserve (Section 30(b) and (c)).

Applications for permission to mine in a reserve must be published. The Minister for Mines may reject such application if, in his opinion, valid objections are lodged.

If the use of the land of a reserve for mining is applied for, the reserve may be exempted from use by the Warden appointed under the Mining Act (exempted under Section 32) for any period not exceeding six months. Any application for exemption for a longer period than fourteen

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7 Mr. T. A. Cleave, the Deputy Surveyor General, says that Class A Reserves set aside under the Land Act should be considered secure in practice because proposed mining leases are always advertised and the Mines Department always consults the Lands and Surveys Department when mining leases are proposed on lands which are reserved under the Land Act.

days shall be heard in Open Court. There is the right of appeal to the Supreme Court.

Petroleum Act, 1936-1954.

This Act empowers the Minister for Mines to search for petroleum and to conduct all intended operations in connection with obtaining, refining and disposing of petroleum produced in Western Australia by entering upon and occupying a reserve either temporarily or permanently. This includes any land in the grant of which petroleum has been reserved; it is understood that in all Crown Grants petroleum is reserved. By Section 12 the Governor may resume the land under the Public Works Act, but so far as Class A Reserves are concerned this would require a special Act of Parliament.

Local Government Act, 1960-1962.

The long title of this Act states that it is to provide for the Good Rule and Government, Convenience, Comfort, and Safety of Persons in Municipal Districts. It allows local authorities to control and improve Public Reserves vested in, or controlled by, them. However, it contains certain provisions which affect reserves in such a way that it could be applied to reduce their effectiveness.

Thus a council may, with the consent of the Governor, take land within the district compulsorily under and subject to the provisions of the Public Works Act, 1902, for the purpose of carrying out a work or undertaking which it is authorised to carry out (Section 282). For example, land may be acquired under the Public Works Act to carry surplus water drains through reserves (Section 365 (2),(4)).

It appears that a local authority could permit hoardings to be erected on roads running through reserves.[8]

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8 Section 286 of the Local Government Act vests in the Crown all land reserved declared or dedicated as a street but Section 300 places the care, control and management of streets in the local authority. Section 218(b) provides that a local authority may make by-laws for the prohibition or regulation of bills, placards and advertisements on hoardings or structures erected upon a public place (which is defined to include a street and a place which the public

are allowed to use, whether the street or place is or is not on private property). Section 306 goes on to provide that the council may do a number of things in or upon a street or other public place in its district including the erection of statues, shelters and seats.

Had the street actually remained in the reserve, that is, had the title remained the same, then it might have been arguable that to erect hoardings would have been to conflict with the dedication of the land as a Class A or other Reserve. However, the practice apparently is to resume any necessary lands for roadmaking purposes, so that, strictly, they form no part of a reserve and are not subject to whatever restrictions might apply to reserves.

A council may be registered as a Trout Acclimatization Society under the Fisheries Act, 1905-1960 (Section 213); in this event the council has power to introduce trout into waters within its district.

A council may make by-laws for regulating the use of the foreshore of the sea, and of rivers, of watercourses and of tidal and non-tidal waters in its district. (Section 214).

Town Planning and Development Act, 1928-1962.

The most important effect of this Act upon reserves is in relation to buildings and small areas of towns which have been set aside for recreational or historical purposes. For example, the local authority responsible for the enforcement of the observance of a town planning scheme may for the purpose of the scheme, with the consent of the Governor, take compulsorily, under and subject to the Public Works Act, 1902-1961 any land comprised in such scheme and whether or not it is situated within the district of the authority (Section 13(1)(b)).

The First Schedule of the Act makes it clear, however, that the spirit of the Act does not conflict with the reserves sections of the Land Act. It makes provision for the maintenance and development of urban reserves for the general well-being of urban communities. (First Schedule 2, 3, 11, 12).

Electricity Act, 1945-1953.

This Act affects reserves in the same way as the Public Works Act, 1902-1961. It gives local authorities, with the consent of the Commission, permission to establish and maintain generating stations in their districts (Section 9) and to take land required for the establishment of such stations under the powers and in accordance with the procedure prescribed by the Public Works Act (Section 10).

It would appear that land required for the building of pylons can be compulsorily acquired in the same way, and the Act specifically gives supply authorities the power to install transmission and distribution works over, along, and across the seashore, or any stream or water (Section 18(b)).

Fisheries Act, 1905-1961.

While this Act provides for the protection of fisheries and thus, indirectly, of species of fish, it also contains provisions which might be detrimental to reserves. However, these effects are safeguarded within the Act itself by the provision that the Governor may from time to time, by proclamation, exempt any portion of Western Australia from the operation of the Act, or any of its provisions (Section 4).

The particular provisions which might have detrimental effect upon nature reserves are those concerned with the acclimatization of trout. The Governor may from time to time, by proclamation published in the Government Gazette, declare that any specified area shall be an acclimatization district for the purpose of the Fisheries Act (Section 30(1)).

It would appear from the Act, although it does not specifically state so, that a Trout Acclimatization Society may introduce trout into any waters within its district. The water flowing through and within fauna and flora reserves is not exempted. However, specific protection is given State Forests and timber reserves (Section 30(4)) since access to and the use of streams within a State Forest for the purpose of fishing shall be subject to such conditions as the Minister for Forests on the recommendation of the Conservator of Forests may consider necessary for the protection of State Forest.

The Vermin Act, 1918-1962.

This Act gives wide powers to the Boards of Vermin Districts to enter and destroy vermin in all land. The Act applies throughout Western Australia and, although the vermin scheduled within it (and by subsequent proclamations) may be relatively unimportant members of the natural communities of reserves, the powers to use controlling measures, and the nature of the measures themselves, could clearly have a considerable effect upon the other susceptible members of natural communities which would be subject to these measures.

The Protection Board, and a local Board may take all such means as may be deemed expedient for the suppression and destruction of vermin or for destroying the eggs of vermin (Section 94(1)). All vermin must be destroyed by the vested or controlling authority of a reserve to the satisfaction of the inspector or authorised person to whom the Protection Board or Chief Vermin Control Officer has given the duty of inspecting such reserve (Section 96). If it fails or neglects to comply with a notice to destroy vermin or their eggs, measures may be taken to ensure the destruction of vermin and eggs but poison can only be used after notice has been given to the occupier of the land[9] (Section 100).

Protection Boards may grant to the owner or occupier of land adjacent to, or divided by a reserve, permission to erect vermin-proof fences across the reserve (Section 108). The Minister or the Protection Board may also, for the purpose of erecting vermin fences, enter upon any lands, cut timber thereon, clear the land on each side of any fence to be erected, altered, maintained, repaired or renewed, without being liable to the owner or occupier (Section 75).

Bush Fires Act, 1954-1963.

The owner or occupier of land which abuts on a reserve may enter upon the reserve for the purpose of clearing, or clearing and ploughing, firebreaks not more than ten

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[9] If the vested or controlling authority objects to poison (e.g. insect sprays being used), it does not appear to have any avenue of appeal except to Parliament itself.

feet in width situated not more than ten chains in distance from the boundary of the reserve and may burn the bush between the firebreaks and the boundary if burning is not contrary to the sections of the Bush Fires Act which prohibit intentional burning off during certain times (Section 34(1)(a)).

When a Bush Fire Control Officer is of the opinion that it is necessary to burn the bush of a reserve in order to reduce or abate a fire hazard which cannot be practically reduced or abated otherwise than by burning, he may enter upon such a reserve (except Forest land) with such servants and workmen, machinery, etc. as he may think necessary for the purpose of burning the bush (Section 34(1)(c)).

Water Boards Act, 1904-1953.

The Governor may from time to time by Order in Council constitute any portion of the State a Water Reserve or Catchment Area and, if the land has not been alienated, place it under the temporary management of a Water Board, or absolutely vest the same in a Water Board. Where the land within the boundaries of the Water Reserve or Catchment Area has been in whole or in part alienated from the Crown, it may be placed temporarily under the control of a Water Board. (Section 36(1)(b)(c) and (d)).

Any Water Reserve or Catchment Area vested in a Water Board by Order of Council under this Section is deemed to be the property of the Water Board and may be used accordingly. (Section 36(3)).

Such a Water Board has power to construct Water Works ("Water Works" include reservoirs, wells, bores, tanks, tunnels, aqueducts, buildings, etc.). (Section 40).

Before undertaking the construction of such works, the Board shall cause surveys to be made, plans to be drawn, and describe the proposed works, their locations, the purposes for which they are to be made, in an advertisement to be published at least twice in the Government Gazette and in one or more newspapers generally circulating in that Water Area (Section 41). Any local authority, corporation or person may object to these, and if the Minister administering the Act decides that the objections are insufficient the Governor may empower the Water Board to construct the proposed works (Section 44).

In addition to constructing Water Works, the Water Board may divert, intercept, and alter the course of streams (Section 46(5)).

The Water Board may take any lands required for its purposes of the works in accordance with the Public Works Act, 1902-1961 (Section 46(2)).

Metropolitan Water Supply, Sewerage, and Drainage Act, 1909-1962.

This Act relates only to the districts of Perth, Fremantle, Claremont and Guildford and reserves in these districts are liable to have works carried out within them subject to the provisions of the Public Works Act. In addition the Act gives power to the Minister subject to the provisions of the Public Works Act to define and acquire land (including land in reserves) outside these districts in order to provide water supplies to those districts. (Section 25).

Rights in Water and Irrigation Act, 1914-1962.

The Minister may, on the advice of Commissioners appointed under this Act, and with the approval of the Governor, acquire any land within any district for the purposes of this Act (Section 62).

If land is proclaimed an irrigation district the Crown may, in the exercise of the right of the Crown to the control of waters and watercourses, and in lakes, lagoons, swamps or marshes, enter upon any land and inspect the same and take such measures as may be thought fit for the conservation and regulation of such water and for its preservation from pollution, and for the protection of the bed over and within which it flows or is contained, and for the moving of any obstruction from such bed and for clearing and deepening the channel of any such watercourse... . (Section 11).

The Governor, on the recommendation of the Minister and acting with the advice of the Commissioners, may proclaim that all the measures mentioned above (Section 11) may be taken in respect of any waters of any part of the State or any particular watercourse, swamp, marsh, lake or lagoon (Section 27).

CHAPTER 5

Nature Reserves and National Parks in Western Australia

CONTENTS [1]

[1] The titles of the areas described in this report relate to their present state of reservation. Thus, areas at present entitled National Parks are called by that name, while pieces of unreserved land are simply referred to as "Areas" and are given geographical prefixes to distinguish them.

INTRODUCTION

One of the main functions of the Western Australian Sub-committee has been to select a series of land areas which contain representatives of each of the major plant communities occurring in the State. This has been done, and this section contains a list and descriptions of these areas.

The Sub-committee believes that each of these major plant communities warrants permanent preservation for the benefit of scientific knowledge in Australia and, as such, these areas should clearly be reserved as Class A Reserves for the preservation of fauna and flora. If they are so reserved they will comprise a system of major reserves for this State which is representative of its native biology.

The Sub-committee believes that it is not enough that we should simply select such areas and set them apart so that they can only be entered by scientific workers and management authorities. The wild life and scenery of some of these areas is so remarkable that they clearly form part of the heritage of ordinary people and, no matter what is scientifically desirable, entry will ultimately be demanded to them. Experience of National Parks authorities in the United States of America leads us to believe that the ordinary public can be both the strongest defenders of wild life reserves and the worst enemies of them. Hence, we must at this stage make provisions (using the experience of others) for the protection and management of the reserves which we are selecting so that the public can use them as far as is consistent with the biological purpose for which they are set aside and, as a result, protect them in its own interest.

If a biological reserve is to be maintained in perpetuity, a number of factors have to be taken into account. First of all, a continental area which becomes surrounded by wire netting and an altered agricultural or pastoral countryside becomes, in fact, an island. As such, it is subject to the changes in the composition of its natural population which

ultimately result in the characteristic imbalances which biologists recognize as being the outcome of insularity. In addition, there is constant invasionary pressure from various alien introductions which are attempting to establish themselves. The danger of introduction increases as the proportion of the length of the boundary to the area of a reserve is increased. Thus both the size and shape of a reserve are important; similarly, the danger of imbalance, as a result of differential fertility of elements of the fauna and flora or the destruction of some elements of a natural community by natural catastrophe (e.g. fire), is reduced as the size of the reserve increases. Thus, a reserve, if it is to be secure (even under proper management) must not be too small.

The minimum permissible size of each type of reserve will differ. This explains why we have found it necessary to suggest the reservation of what appears to be enormous areas of useless land to conserve desert populations, whereas, in the southwest, much smaller areas have been selected.

Fundamentally then, the Sub-committee has selected reserves to preserve biological communities for all time but in some cases where the Sub-committee has felt that the type of land is so striking in its scenic attractions that the public will demand to use the area for visits, camping, picnicing, etc., the Sub-committee has selected additional areas in order to increase the size of the total area to the point at which the Sub-committee hopes that it will be "safe" for the public to use defined portions of it for recreation in the setting of natural bush and tranquility which result from the adjacent sanctuaries. These sanctuaries are preserved for scientific purposes.

The statements of opinion which accompany the Sub-committee's discussion of each area illustrate this concept quite clearly. In cases where land is generally flat or uninteresting, or in a few cases where public entry and the unavoidable natural catastrophes that go with such entry must at all costs be avoided, the Sub-committee holds the view that the area should be reserved for the preservation of fauna and flora only and that all of it be kept in a condition of natural

bush. In most cases such areas have been selected in order to provide standards of comparison with which land of the same type which has undergone grazing and other human interference can be compared. These areas are called Nature-Reserves.

In some cases, where there is a great scenic attraction (as for example in the Mount Bruce and Prince Regent River areas) the Sub-committee has felt that provisions for public enjoyment must be made. In each of these cases there is a statement that a biological survey of the area should be made and following such survey the total area be subdivided and certain portions of it set aside to be Class A Reserves for the preservation of fauna and flora and kept in perpetuity as natural bushland (i.e. Nature-Reserves), while other areas should be gazetted as Class A Reserves for public recreation and public access ought to be provided to these and their facilities. The American experience of such dual purpose areas seems to be that where the total area for public recreation does not exceed ten percent of the whole, the biological value of the total area is not destroyed. To many people this proportion of 1 : 10 may seem an alarming disproportion but it must be stressed that the enjoyment of the public in visiting these areas lies in the enjoyment of comfortable facilities in a natural bush setting. Any development which will cause deterioration in the natural bush will ultimately turn the whole area into no more than an ordinary pleasure-ground.

In reading through this chapter it will be noticed that the terms "National Park" and "National Nature-Reserve" have been used in connection with many of the lands. In using them the Sub-committee has been conscious of the existing and well entrenched meanings of the words but a definite terminology is needed and the Sub-committee has thus attempted to specify and restrict the meanings of the combinations of words in a way which takes into account both current use and the need for clearly defined terms.

The word National has two possible meanings in the context National Park and National Nature-Reserve. These are that it implies either National

ownership (as it does in the United States where the National Parks come under the control of a Federal National Park service) or it implies National in importance. Owing to the fact that land in Australia is controlled by the States and, unless the States themselves voluntarily hand over the control of their parks to a Commonwealth service, the parks must remain State instruments, the Sub-committee has adopted the latter meaning of National in importance. Thus, the term National, as applied here, means that the Sub-committee considers that the area concerned is unique in Australia and preserves fauna and flora which, if lost through agricultural and pastoral development, will represent an irreplaceable loss to knowledge of Australian biology.

Unfortunately, the position is somewhat complicated by the entrenched use of the words National Park in relation to a number of minor land areas in Western Australia which cannot, in the context of this report, be classified as National Parks. However, the public has long used the term National Park for these areas and will probably continue to do so.

The choice of the word Park for a large, enclosed piece of ground devoted to public use is logical and well understood, but, in contrast, the word Reserve has so wide a legal meaning (where, for example in the Land Act, it includes sites for schools, burial grounds, fauna and flora reserves, gravel pits, etc.) that to attempt to restrict its use would be pointless. Therefore, it has been restricted by the addition of the word "Nature", and in the combination "Nature-Reserve" its use is restricted to land set aside under the Land Act for the preservation of fauna and (or) flora.

A National Nature-Reserve is thus defined as an area of land containing fauna and flora of National importance; set aside in perpetuity in order to conserve that fauna and flora; and of great enough area for its fauna and flora to be preserved indefinitely under proper management.

A National Park is thus defined as a piece of land of such outstanding importance to the Nation that it contains both a National Nature-Reserve(s) and an additional area(s) reserved in perpetuity for the recreation of the public. The Recreation-Reserve (including roads and access ways in all parts of the National Park) not exceeding one tenth of the total area of the National Park.

It must be noted that it is our view that the designation of the areas to be Nature-Reserves and Recreation-Reserves in a National Park is by law and not within the control of the authority which is developing and managing the park. We believe that this procedure is important. The haphazard and insidious developments which follow with popularity are the greatest hazards to which any area set aside to conserve wildlife has to contend. Roads, campsites, picnic grounds, etc., if allowed to develop without control over a large area, rapidly expose the whole area to infestation by alien introductions, and natural bush is disturbed out of all proportion to the benefits gained by the public.

Finally, it will be noticed that all the areas mentioned in this report are relatively large. This does not mean that we, as a Sub-committee interested in conservation, consider small nature reserves (including even those of a few acres) unimportant. From the point of view of maintaining the <u>total</u> natural fauna and flora of a region, they can probably do little, but a part of the fauna or flora will often flourish in a reserve of this type. Further, these small reserves will ultimately develop their own characteristic faunas and floras, many components of which will be introduced and alien to the original area. Although unnatural, these will form as integral a part of the Australian scene of the future as the modern faunas and floras of the English copses and hedgerows do in the parts of England which not many centuries ago were covered with the communities of the mixed oak forest. Moreover, apart from their use as sanctuaries for animals and plants, these small reserves play a most important part in lending variety to the agricultural scene.

Western Australia has many of these small reserves at present (see list of Reserves, Chapter 3 of this report) and it is hoped that the present attitude of the public towards such organizations as The Tree Society and The National Trust of Western Australia will lead to the establishment of many thousands of small private and public reserves throughout the country.

TABLE

CATEGORIES OF PARKS AND RESERVES AND NOTES ON THEM

Category	Purpose	Comment
National Nature-Reserve	To conserve Fauna and Flora unique in Australia. To provide comparison with other similar areas altered by man.	Must be Class A Reserve. A natural bush area. No tourist development (except in separately created adjacent reserves. Continental areas, subject to management programmes designed to maintain biological balance and structure - see National Parks below).
National Geological-Reserve (see Chapter 6)	To preserve unique geological structures, phenomena, or type sections.	Must be Class A Reserve. No development or mining or quarrying.

Category	Purpose	Comment
National Anthropological-Reserve (see Chapter 7)	To preserve unique native art, campsites or other remains.	Must be Class A Reserve. No development, but controlled access routes in certain specified cases. Vandalism a major problem. Legal protection is only a part of the solution, the remainder probably lies with education and efficient management.
National Historical-Reserve (see Chapter 8)	To preserve historic buildings or sites important in Australian History.	Must be Class A Reserve. Controlled access. Maintenance a major consideration.
Other Reserves (See Land Act)	Various purposes of local importance.	May be but not necessarily Class A Reserve. Must all be vested in statutory bodies. Important because these minor reserves, although not unique, provide for the recreation and health of local communities and for specific local scientific and naturalist purposes.

Category	Purpose	Comment
National Parks	To provide for the public enjoyment of natural bush or scenery in such a way that the bush and wildlife (total faunal and floral assemblages) remain unimpaired.	Comprises one or more National Reserves (see above) together with Class A Reserves for public recreation. Must be spacious areas in which Reserves for public recreation and access roads do not exceed one tenth of the whole area. Whole area controlled and managed by a single wildlife and park management authority.
Other Parks (i.e. Recreational-Reserves)	To provide the public with natural recreational facilities in certain locally important and popular localities.	Same guiding principles as for National Parks but subject to change by management who need not necessarily maintain natural balances and conditions.

TABLE

HUMAN NEEDS AND PARKS AND NATURE-RESERVES

The needs of the general public and the scientific worker and naturalist can be met by a planned system of parks and reserves and an efficient management authority. Without this planning and rigid control, parks and nature-reserves soon degenerate by losing

their natural charm and their value is lost both to the tourist and the naturalist. The needs of people, the effect they have, and how a parks and reserves system meets these, is shown below.

Needs	Kind of Park or Nature-Reserve	Comment
Public and tourist desire to see and enjoy spectacular scenery in natural bush conditions.	Recreational areas of National Parks	The access ways and facilities of the recreational areas provide the means of enjoying natural scenery without spoiling it.
General public want to enjoy recreational facilities in a natural or semi-natural setting in certain locally important sites.	Other Parks	These areas are important to the health of human communities. They are not designed to preserve fauna and flora except in so far as they add to human enjoyment. They are subject to much change by management which need not maintain natural communities of wildlife; although trees, flowers and animals will probably be the background attraction to these parks.
Public and naturalists want to see, without endangering its survival, Australia's unique wildlife.	National Parks and roads through and around National Nature-Reserves and Other Nature-Reserves	The secure wildlife of the reserves can be seen from the adjacent recreational areas or road systems.

Needs	Kind of Park or Nature-Reserve	Comment
Biologists' desire to study and conserve our wildlife heritage under natural conditions.	(a) National Nature-Reserves and Nature Reserves of National Parks	These areas of National importance are designed, and biologically managed, to ensure conservation for ever.
	(b) Other Nature-Reserves	These areas, when for the conservation of fauna and/or flora are set aside to meet the local needs of naturalists or scientists.
Biologists require areas of unaltered fauna and flora against which changes (both harmful and beneficial) in settled and developed areas can be measured.	National Nature-Reserves and Nature-Reserve areas of National Parks	In most cases these will be the only nature-reserves big enough to completely preserve floras from the effects of the presence of man and his introductions.

1.— THE NORNALUP NATIONAL PARK

The Nornalup National Park comprises an area of approximately 32,943 acres on the southern coast, seventy miles west of Albany. The country of the National Park is composed of Kainozoic sediments which form low hills clothed with extensive forest. This is particularly fine Karri forest (Eucalyptus diversicolor) which closely approaches temperate rain forest in

A Giant Tingle, Nornalup National Park

character. Large parts of it have not been damaged by logging and some of today's largest Karri trees stand in this area.

The National Park is one of the most popular tourists resorts of the south coast. It has great natural beauty, particularly where the heavy timber of the hills comes almost to the water's edge, as it does along the shores of Nornalup and Walpole inlets and the Frankland River.

The fauna of the National Park is typical of that of the Karri country. Among the more common animals are such species of mammal as the Grey Kangaroo and the Short-nosed Bandicoot (or Quenda). One species of frog, Crinia laevis, which occurs in Eastern Australia is, in Western Australia, only found in the National Park. A plant, Haloragis racemosa, is also only known from the National Park.

Certain areas within the National Park are leased to the owners of furnished houses which are for hire to visitors to the Park. In addition, there is a guest house, Tinglewood, and two camping sites. The camping sites have no laundry facilities, showers or electricity. Boating and fishing facilities are provided by the proprietors of the various accommodation houses, and visitors to the Park can make arrangements for their transport by motor car and launch where this is required.

The National Park is easily accessible by road. It is approximately 200 miles from Perth by way of Bridgetown and Manjimup, and is only a short distance, by a good road, from Albany.

The Nornalup National Park is an outstanding area and should remain classified as a National Park. However, it is undesirable that areas of this Park should be leased. It is clear that a full examination of this situation should be undertaken so that development by leasing be halted and not allowed to spoil the untouched areas of natural bushland. These should be clearly set aside by legislation as Class A Reserves for the preservation of flora and fauna and kept for all time in their natural state.

Location: $34^{\circ}55'$ - $35^{\circ}5'$ S
$116^{\circ}30'$ - $116^{\circ}48'$ E

State of Reservation:

A 13045 — Set aside as Parklands, vested in the National Parks Board, with power to lease for 21 years vide Gov. Gaz. 22.3. 57/938. Class A.

18722 — Set aside for National Park, vested in the National Parks Board, with power to lease for 21 years vide Gov. Gaz. 22.3. 57/938. Class C.

18723 — Set aside for National Park and Tourist Resort. Class C.

18724 and 18725 — Set aside for National Parks. Class C.

A 19175 — Newdegate Is. Set aside for National Park. Class A.

A 19176 — Set aside for National Park. Class A.

(The last five mentioned reserves are all vested in the National Parks Board, with power to lease for 21 years vide Gov. Gaz. 22.3.57/938).

Area: 32,943 acres approx.

Literature: Pollard, J. (1928). — The Nornalup Camp-out. Emu 27 : 163-168.

Opinion: The Sub-committee is of the opinion that:

1. an expert committee should be set up to examine the Nornalup National Park and make recommendations on the sub-division of the Park into areas to be classified by legislation and

proclamation as either Class A Reserves for the protection of fauna and flora, or Class A Reserves for public recreation;

2. the whole should comprise the Nornalup National Park and remain vested in the National Parks Board or its successor.

2.— PORONGURUP RANGE NATIONAL PARK

This small National Park of 5,384 acres embraces the Porongurup Range which lies approximately seventy miles north of Albany.

The Porongurups are of magmatic granite, well jointed, and comprise a low rugged range of hills which rise to 2080 feet. They are much lower in altitude than the peaks of the nearby Stirling Ranges, and the vegetation is very much the same as that of the Karri country. Karri (Eucalyptus diversicolor) occupies a considerable portion of the western half of the Range, and one species of plant, Villarsia calthifolia is only known from one moist spot near the top of the hills. It occurs nowhere else in the world.

A guest house has been built just outside the precincts of the Park and is reached by a bitumen road from Mt. Barker. This guest house is at the foot of the northern slope. Gravel tourist roads and walking paths have been established throughout the Park.

As far as is known the fauna of the Range is typical of the South-west and it is chiefly remarkable as being the only known area where the geographical ranges of the two species of tree frogs, Hyla moorei and Hyla cyclorhynchus overlap. One of the sites of co-existence without interbreeding has been destroyed by the construction of Bolganup Dam as a water supply for Mount Barker.

Common at the foot of Nancy's Peak but restricted to the Porongurups is a species of primitive Mygalomorph spider belonging to an undescribed genus. Two other species of the genus are known, one from the Stirlings and the other from the Grampians in Victoria.

Because of its very small size, this Park is very vulnerable to the unwitting destruction of its natural bush and fauna through haphazard tourist development.

Location: $34^{\circ}39'$ - $34^{\circ}42'$ S
$117^{\circ}50'$ - $117^{\circ}56'$ E

State of Reservation:

Class A - National Park (Reserve No. 18987) - Vested in National Parks Board.

Area: 5,384 acres approx.

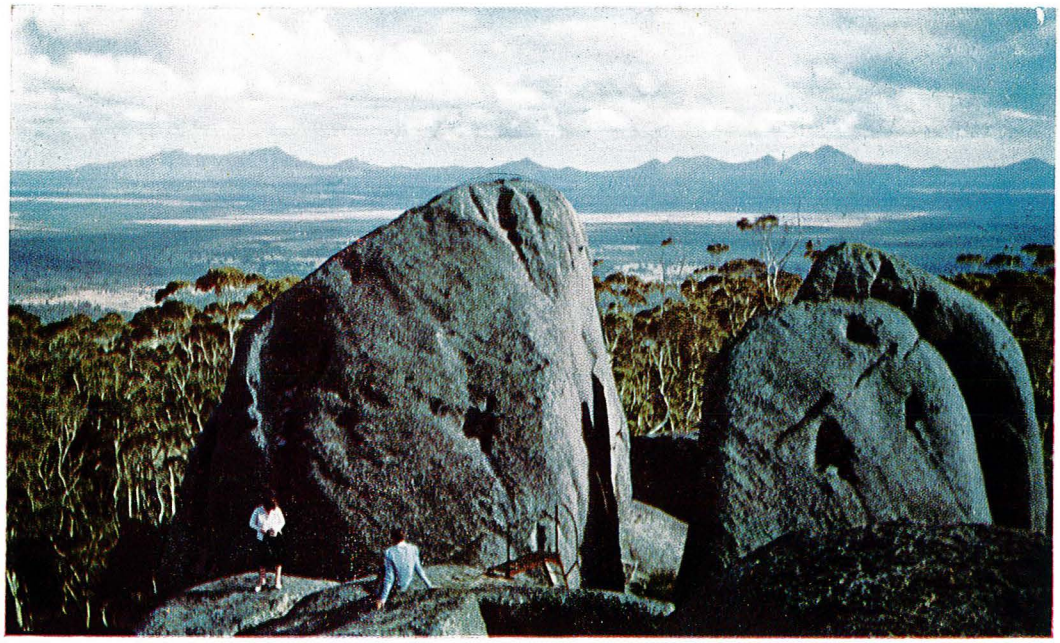
Literature:

Le Souëf, A. S. (1921). — Notes on birds seen on the Porongurup Mountains (near Albany), Geraldton and Ooldea (Transcontinental Line). Emu 20 : 140-144.

Smith, G. (1962). — The Flora of Granite Rocks of the Porongurup Range, South Western Australia. J. roy. Soc. W. Aust. 45 : 18-23.

Opinion: The Sub-committee is of the opinion that:

1. an expert committee should be set up to examine the Porongurup Range National Park and make recommendations on its subdivision into areas to be separately classified by legislation as either Class A Reserves for the protection of



Castle Rock (Porongorups National Park) with the Stirlings in the background

Bluff Knoll (3,640') Stirling Range National Park

flora and fauna, or Class A Reserves for public recreation;

2. the whole should comprise the Porongurup National Park and remain vested in the National Parks Board or its successor;

3. if the expert committee decides that the existing area of the Park is too small to provide both effective fauna and flora reserves and areas for development for public recreation, the Sub-committee recommends that additional areas adjacent to the Park be acquired.

3.— STIRLING RANGE NATIONAL PARK

The rugged peaks of the Stirling Range, which are named after the first Governor, Captain James Stirling, are the dominant land-mark of the country inland of King George's Sound.

The National Park is one of the largest Class A reserves in Western Australia. It encloses the entire mountain system of the Range which comprises Upper Proterozoic metasediments, quartzites and sandstone in its upper members, with shales and slates in the lower. Overall, these sediments strike east-west and dip to the south at variable angles.

On rare occasions snow has been recorded on the higher parts of the Range.

On account of the altitude of the mountains, and the almost daily incidence of clouds on the summits, the Range carries a highly interesting endemic flora, which from the point of view of the attractive feature of its plants, makes it one of the most outstanding

botanical reserves in Western Australia. The number of endemics in this area must be almost 100; these include the large and spectacular species of Darwinia, of which eight or nine are restricted to the range, Isopogon latifolius, and at least two Banksias which are restricted to the area. Species of Hypocalymma are also not found elsewhere.

Generally speaking, the area is mainly covered by dense shrubs which vary in height from three feet to about eight feet. There are forests of Jarrah (Eucalyptus marginata) on the low-lying areas of sandy soil between the mountains.

The fauna is an interesting one. It includes the frog Metacrinia nichollsi which occurs on the south face of Bluff Knoll and on the top of Toolbrunup. Elsewhere this frog does not occur in the Porongurups but is restricted to Karri Forest along the south coast and Pemberton. The trapdoor spiders of the Stirling Range are worth mentioning. They are remarkable in three aspects, firstly, there is a unique population of Eucyrtops riparia at Moingup Spring, secondly, the furthest western population of Aganippe occidentalis is found at Bluff Knoll (a species known elsewhere from arid areas such as Kalgoorlie and Norseman), and thirdly, there is an archaic form of ctenizid trapdoor spider which is as yet undescribed. Two other undescribed species of this strange genus of spiders are known — one from the Porongurups and the other from the Grampians in Victoria. The populations of these spiders at these three localities are remarkably distinctive, and it seems likely that they are relics of an early Tertiary distribution.

The land snails of the Stirling Range are also of great interest. The populations of Bothriembryon indutus are remarkably polymorphic in shell colour, and contrast with the population of B. kingii which shows no morphological diversity in shell colour, yet has enormous biochemical diversity as shown by paper chromotographic techniques. These biochemical differences appear to be related to the differences in altitude of the various mountain peaks.

The Chester Pass road which links Borden with Albany provides access to the rugged central part of the Range, and as yet no tourist accommodation has been established in the National Park. Most visitors to the Range to-day are accommodated in Albany and there is a regular tourist bus service from this town. Numerous tracks are now being constructed.

Location: 34°18' - 34°28' S
117°11' - 118°8' E

State of Reservation:

Class A National Park (Reserve No. 14792). Vested in the National Parks Board of Western Australia.

Area: 270,000 acres approx.

Literature:

Bradshaw, F.R. (1928). — Fauna of the Stirling Range. Emu 27 : 176-178.

Milligan, A.W. (1903). — Notes on a trip to the Stirling Range. Emu 3 : 9-19.

Sofoulis, J. (1958). — Notes on a reconnaissance of the Stirling Range Area, South-east Division. Bull. Geol. Survey W. Aust. 109 : 78-80.

Whitlock, F.L. (1911). — In the Stirling Ranges, Western Australia. Emu 10 : 305-317.

_____ (1912). — Further notes from the Stirling Ranges, W.A. Emu 11 : 239-243.

Opinion: The Sub-committee is of the opinion that:

1. an expert committee should be set up to examine the Stirling Range National

Park and make recommendations on the subdivision of the Park by legislation into areas to be classified as either Class A Reserves for the protection of fauna and flora, or Class A Reserves for public recreation;

2. the whole should comprise the Stirling Range National Park and remain vested in the National Parks Board or its successor.

4.— THE MARGARET RIVER-HAMELIN BAY AREA

The country to the west of the main road which runs south from Margaret River to Augusta (the Bussel Highway) contains some of the most outstanding scenic attractions of the south-west. At present much of it is included in small discrete reserves which have been set aside for a number of different purposes and are controlled by various authorities.

Jarrah forest is the dominant tree association in the area. In this Jarrah (Eucalyptus marginata) is associated with Marri (E. calophylla), Blackbutt (E. patens) and Mountain Marri (E. haematoxylon) while the under-storey consists of Casuarina, Acacia, Proteaceae, and Myrtaceae. The smaller shrubs consist of a large number of species from numerous families.

In addition to the Jarrah forest there are numerous extensive areas of Karri forest with all the associated vegetation typical of it consisting of Acacia, Myrtaceae, Epacridaceae and Rhamnaceae.

Geologically, the area is very interesting. The Precambrian granite outcrops in various places. In some exposures it is overlain by Quaternary conglomerate, aeolianite, and calcareous dune sands. There are numerous good sections exposed in the cliffs and the aeolianite is honeycombed by magnificent cave systems,

some of which have been developed as tourist attractions.

The caves of the Margaret River area and, in particular, Mammoth Cave, have long been known to contain the richest Quaternary deposits of fossil mammals yet found in Western Australia. Radiocarbon dating has recently established that these fossils are at least 37,000 years old. Among the fossils are such extinct forms as Nototherium, Sthenurus, the Tasmanian Devil (Sarcophilus) and the Tasmanian Wolf (Thylacinus) and the remains of other animals which still occur in Western Australia such as the Quokka (Setonix) and the Grey Kangaroo (Macropus). The Quaternary conglomerate which has its type section at Cowaramup Bay is richly fossiliferous, while fossil marine invertebrates and fossil land snails are not uncommon in the dune sands.

The fauna is typical of that of the Jarrah forest of the south-west and contains, among mammals, such forms as the Grey Kangaroo (Macropus), the Native Cat (Dasyurus geoffroyi), the Wambenger (Phascogale tapoatafa) and various small forms such as Antechinus and Sminthopsis. Birds are numerous, and some, e.g. the Fire-tailed Finch, are extremely beautiful. Sandy soils, limestone outcrops and extensive swampy depressions all carry characteristic vegetation and the great variety of vegetation and habitat types in the area provides for a very diverse fauna and makes the area biologically most important.

The area is accessible by road and bus from Perth and other parts of the south-west. It is about 160 miles from Perth. There is good hotel accommodation at Margaret River, Yallingup, Busselton, and Augusta, and furnished cottages and motels are common within easy driving distance of the area. In addition there are facilities for tent and caravan camping at Prevelly Park which is located 6 miles due west of Margaret River near the coast. Provisions can be obtained from a store at the townsite, water, septic sewerage, laundry facilities, etc., are laid on, firewood and D.C. electricity are available.

The area is an outstanding one and its proper control and development will play a great part in the future of tourist activity in the Margaret River, Augusta and Busselton district. Tourist development

must be limited and carefully planned before it spreads out of control and destroys the natural beauty of the countryside.

Location: 23° - 24° S
120°18' - 123°36' E

State of Reservation:

Reserves in this area are complex. There is a large area of State forest and some Class A reserves for public recreation and for caves, recreation and fauna. A full list of these reserves is given below:

A 7406: Protection and Preservation of Caves, flora and for health and pleasure resort. Class A.

A 13404: Recreation. Portions vested in Augusta-Margaret River Shire Council. Class A.

22216: Exempted from sale. Not vested. Class C.

22673: Common. Not vested. Class C.

8694: Caves, flora, fauna, health and pleasure. Not vested. Class C.

A 8427/38: Protection and Preservation of Caves, flora health and pleasure resort. Chief Secretary's Office. Portion 8434 and 8429 vested in Augusta-Margaret River Tourist Bureau. Class A.

15426: Limestone. Not vested. Class C.

20724: Recreation. Not vested. Class C.

21769: Recreation. Golf links. Not vested. Class C.

19952: Exempted from sale. Not vested. Class C.

20547: Public utility. Not vested. Class C.

20548: Public utility. Not vested. Class C.

1087/41A: Lease.

1358: Temporary Reserve.

20848: Common. Not vested. Class C.

6017: Landing Place. Not vested. Class C.

The area also includes the Boranup sand patch, an area which has been leased for mining purposes, and the continuity of reserves from north to south is broken in two places (east of Rocky Point, and at the mouth of Ellen Brook) by Crown grants. The area also contains some vacant land.

Area: 34,000 acres approx.

Literature:

Anon. (1961). — The Caves of the South West Western Australia. Tourist leaflet.

Cook, D. L. (1960). — Some mammal remains found in caves near Margaret River. W. Aust. Nat. 7 : 107-108.

Glauert, L. (1910). — The Mammoth cave. Rec. W. Aust. Mus. I : 11-36.

_____ (1912). — The Mammoth cave (contd.). Rec. W. Aust. Mus. I : 39-46.

_____ (1914). — The Mammoth cave (contd.). Rec. W. Aust. Mus. I : 244-251.

_____ (1948). — The cave fossils of the South-west. W. Aust. Nat. I : 100-104.

Lundelius, E. (1960). — Post Pleistocene faunal succession in Western Australia and its climatic interpretation. Rept. Int. Geol. Congress 21 Session. Pt. IV : 142-153.

Woodward, B. H. (1910). — Fossil Marsupials of Western Australia. Rec. W. Aust. Mus. I : 9-10.

_____ (1914). — Further important discoveries in the Mammoth cave. Rec. W. Aust. Mus. I : 252.

Opinion: The Sub-committee is of the opinion that:

1. an expert committee should be set up to examine the Margaret River-Hamelin Bay area and make recommendations on its division by proclamation (and legislation where necessary) as either Class A Reserves for flora and fauna, or Class A Reserves for public recreation. The whole to comprise the Margaret River-Hamelin Bay National Park;

2. State Forest 45, should it ever be no further required by the Forestry Department, should be included in the National Park by proclamation and that similar arrangements should be made in respect of the mining lease of the Boranup sand patch;

3. the National Park should be vested in a Statutory Body having control of other National Parks.

5.— LUDLOW STATE FOREST (SOUTHERN PORTION)

State Forests Nos. 1 and 2 (Ludlow), which lie astride the main road between Capel and Busselton, con-

tain the finest remaining examples of the southern Tuart forest. Here the Tuart (Eucalyptus gomphocephela) reaches a maximum height of 120 feet and occurs in an almost pure stand with minor occurrences of Yate (E. cornuta), Flooded Gum (E. rudis) and Marri (E. calophylla). The Tuart is associated with an understorey of Peppermint (Agonis flexuosa) with occasional Banksia, Hakea and Melaleuca.

Grazing, timber felling, and until recent years more frequent burning, which followed settlement, have contributed to a marked increase in the growth of understorey species and much of the forest has now lost much of its original savannah character.

An area of lower quality Tuart forest was converted to pine plantation, mainly prior to 1940, but with minor additions since, and the present Tuart stands are now distributed in three sections; the best known of these, the South Western section lies between Ludlow and Wonnerup where it is traversed by the main Busselton Highway. Here it provides an outstanding scenic drive with prime Tuart forest fringing the highway for 170 chains on its northern side and for 260 chains on its southern side.

The outstanding properties of Tuart timber which render it suitable for certain special purposes, such as railway vehicle construction, would appear to ensure the future security of this forest. However, the extension of mining operations associated with the treatment of mineral sands on this locality could pose a future threat.

Forest policy has aimed at the perpetuation of prime Tuart forest with special emphasis placed on the preservation of the scenic value of the strip adjoining the highway. Any felling in this strip during the last thirty years has been in the interests of public safety and involved the recent removal of a number of over mature trees which constituted a potential danger to users of the highway.

Location: 33°31' - 33°38' S
115°23' - 115°33' E

State of Reservation:

State Forest No. 1 and Portion State Forest No. 2 (1961).

Area: 5,000 acres approx.

Literature: None known.

Opinion: The Sub-committee is of the opinion that:

1. a strip of five chains in width on either side of the main road where it passes through Ludlow State Forest should be set aside and proclaimed a Class A Reserve for the preservation of flora (i.e. Tuart Forest) and vested in the Conservator of Forests as a National Nature-Reserve;

2. should any portion of the Ludlow State Forest still carrying Tuart become no longer economically important for the preservation of Tuart for forestry purposes, it should be proclaimed a Class A Reserve for the preservation of flora and vested in a Statutory Body having control of other National Parks;

3. the assurances of the Conservator of Forests should be sought that the area of Ludlow State Forest still carrying Tuart should on no account be cleared of Tuart Forest and replanted with alien timber.

Mangles' Kangaroo Paw *(Anigosanthos Manglesii)*
State Floral Emblem of W.A.

6.— MANDURAH AREA

The two lakes, Preston and Clifton, lie to the south of the Harvey Estuary which opens into the sea via Peel Inlet at the township of Mandurah. The lakes and estuary are the haunt of large numbers of waterfowl and the country around the lakes is typical of the succession of vegetational types which are found on the Swan Coastal Plain between the sea and the hills of the Darling Scarp.

The sea coast is sandy in the vicinity of the lakes; there are no islands offshore and no rocky headlands except for a few small outcrops of coastal limestone. The coastal sand dunes are covered with heath, and often with thickets in the hollows. Immediately behind these dunes is an open treeless heath on plains and limestone hills, and there are many outcrops of limestone standing out of the sandy soil. Grey Kangaroos can be seen in this heath in the early evening and Emus also occur in the area.

Sandy soils of the Mandurah area are clothed with Tuart Forest which has an extensive under-storey of Banksia and Acacia, with a ground flora of shrubs and herbs. In swampy portions of the country, paperbarks (Melaleuca spp.) and Flooded Gum (E. rudis) become dominant, with a shrubby layer of Hakea, Viminaria, sedges, rushes, and herbs.

This beautiful Tuart forest was occupied in the early days of the colony and a number of old farmhouses remain alongside the old coast road from Mandurah to Bunbury. Some of these are more than a century old and one barn in the area was loopholed for defence against attack by natives. These old buildings are worth preserving as examples of early colonial architecture.

The two largest lakes in the area are Lakes Clifton and Preston, both long narrow lakes lying within old dune systems parallel to the coast. Lake Clifton is twelve miles long and Lake Preston seventeen miles; both have a width of about one mile. Between them are a num-

ber of smaller lakes similar in character. They are open shallow lakes of salt water and their bottoms are covered with a fine silt. They are fringed with paperbarks, and rushes grow at the margin wherever there is a seepage of fresh water into the lake. In other places there are open reaches of limestone crust. In summer and autumn these lakes are covered with water birds. At the south end of Lake Clifton is attractive country which in winter is swampy and which possibly provides breeding areas for ducks.

In the deeper sandy soils of hilly country Jarrah/Banksia woodland occurs. In places the woodland is mainly Banksia, with less frequent Jarrah, Tuart, and Sheoak, but on the forestry reserve to the east of Lake Clifton it develops into fairly good Jarrah Forest with Banksia grandis and Sheoak in the under-storey. The swamps and lakes of this region are an important part of the habitats of the fauna of the area because they provide breeding grounds for many aquatic birds. These swamps have a fringe of paperbarks which may even cover the whole swamp, but at the lakes the paperbarks enclose open sheets of water with stands of bullrushes.

Nearly all the country with these characteristic swamps in this part of the coastal plain is now a network of drains. Some swamps are used to hold water for stock at the end of the winter while other swamp land has been drained for crops and pasture. It appears likely that most of the swamps of this part of the Swan Coastal Plain which are not included in reserves will be drained ultimately.

The area is rich in birds and wild flowers. A report made to the Fauna Protection advisory Committee by an observer records a hundred species of birds seen in a fortnight of holidaying. During the same period on Salt Lake, west of Lake Clifton, 366 birds of eleven species were counted while on Lake Clifton about 1,370 birds of sixteen species were counted including 265 Black Swans. The presence of these large numbers of water fowl within a few hours run from Perth on excellent roads could clearly prove a most important attraction to visitors.

The area in the vicinity of Lakes Preston and Clifton contains a number of scattered reserves which have been set aside for various purposes. These include flora and fauna reserves, a common, recreation grounds, uncommitted lands, and Crown grants.

It is clear that the area would merit reservation as a National Park to represent and preserve examples of the varied habitats of the Swan Coastal Plain. It could contain fine ocean beaches and very varied coastal scenery typical of that seen by the early settlers who arrived at the Swan River Colony in the early days of the last century. The area even contains examples of their early habitations.

Since 1946 the Fauna Protection Advisory Committee has discussed proposals (originating from Mr. H. M. Wilson of the Goldfields Water Supply) that the area should become a National Park. In 1955 the Committee recommended that the area be set aside for this purpose and that it should consist of a number of disconnected parcels of reserves and Crown land. This recommendation was restated in 1957 as follows:

(1) That the National Park between Mandurah and Harvey consists of a series of disconnected parcels of land including -

   (a) all the existing reserves extending from and including Reserve 2851 in the north to Reserve 23597 in the south;

   (b) existing reserves around Peel Inlet;

   (c) existing reserves on the eastern shore of the Harvey Estuary;

   (d) all the unalienated lakes in the general area;

   (e) all the unalienated land south of location 837 to the Harvey Diversion.

(2) That no freehold land be resumed.

(3) That the Committee welcome gifts of land (or funds to purchase land) from public-spirited persons,

but otherwise only existing reserves and unalienated Crown Land be included.

(4) That the purpose of the Park should include preservation of the habitat, conservation of fauna, and public recreation, with facilities for camping, fishing, canoeing, duck shooting and other open-air pastimes as determined.

(5) That the Park be zoned to allow the provision of facilities for recreation in some sections, while others should be kept in a primitive or semi-primitive state.

(6) That the Park be administered by the National Parks Board of Western Australia and the Fauna Protection Advisory Committee working in close collaboration.

There has been considerable local opposition to the scheme for a National Park in this area and the recommendations of the Fauna Protection Advisory Committee take account of this.

Location: $32^{\circ}37' - 33^{\circ}11'$ S
$115^{\circ}35' - 115^{\circ}45'$ E

State of Reservation:

8185: Exempted from sale.

A 20215: National Park. Vested Murray Shire Council. Class A.

4990: Public utility. Not vested. Class C.

23015: Camping and recreation. Class C.

24036: Flora and fauna. Class C.

452: Crown grant.

223: Crown grant.

276: Crown grant.

277: Crown grant.

278: Crown grant.

279: Crown grant.

280: Crown grant.

6627: Water. Class C.

13359: Water. Class C.

2707: Public utility and conservation of flora and fauna. Class C.

7502: Exempted from sale.

2738: Landing place and water. Class C.

11718: Water. Class C.

2851: Travellers and Stock. Class C.

A 24739: Flora and fauna. Class A.

25223: Recreation. Class C.

Area: 30,000 acres approx.

Literature: Serventy, D. L. (1930). — A glimpse of the bird-life between Mandurah and Bunbury, W.A. Emu 30 : 33-38.

Opinion: The Sub-committee is of the opinion that:

1. an expert committee should be set up to examine the area specified above to make recommendations on the division of it into areas to be classified by Proclamation as either Class A Reserves for the protection of fauna and flora, or Class A Reserves for public recreation;

2. the whole to be vested as a National Park in a single Statutory management

authority having control of other National Parks.

7.— PINGELLY and DRYANDRA RESERVES

Some of the most varied and biologically productive areas in Western Australia lie in the Wandoo (E. redunca var. elata) Forest along the edge of the wheatbelt. In spite of the fact that much of this country has been taken for agricultural development, a number of outstanding reserves still remain today and these should quite clearly be reserved in perpetuity for the preservation of fauna and flora.

Three reserves, in particular, are selected for permanent preservation as being of national importance and these are the East Pingelly reserves, the West Pingelly reserves at Boyagin Rock and reserves in vicinity of State Forest 51 at Dryandra.

The East Pingelly Reserve in particular has a remarkable diversity of flora which interdigitates to produce unusual floral complexity for such a small area. Here, in this single small reserve, occur the floras of sand-plain, granite rocks, and breakaways of laterite, in addition to the more widespread temperate savannah woodland with open canopies, well developed tree layer and abundant ground flora. The main associations are Wandoo (E. redunca var. elata), Powder Bark Wandoo (E. accedens), Brown Mallet (E. astringens), Sheoak (Casuarina huegeliana), and sandheath. In addition York Gum (E. loxophleba), Jam (Acacia acuminata) and Acacia cyanophylla are dominant in small areas. The outstanding botanic importance of this reserve despite its small size, is the great diversity of the vegetation associations to be found within its boundaries.

The mammalian fauna is also outstanding in its richness and includes Woylies (Bettongia penicillata), Grey Kangaroos (Macropus ocydromus), Tammars (Protemnodon eugenii), Possums (Trichosurus and Pseudochirus), Quendas (Isoodon obesulus), Wambengers (Phascogale tapoatafa and

P. calura), Numbats (Myrmecobius), Marsupial Mice (Sminthopsis and Antechinus), and Echidnas (Tachyglossus). Some measure of its productivity in small mammals is given by the fact that two pairs of Wedge-tailed Eagles (Uroaetus audax) nest within the reserve. These predators support themselves and raise their young upon prey taken from within the reserve.

From the point of view of the history of our knowledge of Western Australian mammals, the reserve at East Pingelly is of great interest because it was one of the localities at which the important Western Australian collections in the British Museum were made by Guy Shortridge during his stay in Western Australia in 1906. As a result of Shortridge's work, there is a good record of the mammal and bird species available in the area early in this century and comparisons today make it clear that this reserve retains almost all of the varied fauna which Shortridge found there fifty years ago.

The Boyagin Rock reserve, although less diverse in its environments than the East Pingelly reserve, contains a magnificent exposure of granite rock and its associated fauna and flora. Alongside the Boyagin Rock reserve there is a small and pleasant picnic spot which is a reserve for public recreation. This is conveniently placed on the outskirts of the main reserve.

The Dryandra State Forest (S.F. No. 51) area is also extremely diverse in its fauna and flora and contains excellent mammals and birds. Projecting into this State Forest is an area of 4,300 acres which is called the Congelin railway water reserve (Reserve No. 16201). The Dryandra State Forest and this water reserve are chiefly remarkable in the very fine populations of the Banded Anteater or Numbat (Myrmecobius) which were recently studied by J. H. Calaby of Wildlife Survey Section, C.S.I.R.O.

These three areas of major importance are all small and, as such, they are liable to destruction as natural bush areas. All have good access roads through them and along the edges of them, and tourists wishing to see the animals can do so by simply driving through them after dark when a surprising number of rare forms

may be seen crossing the road and in adjacent scrub. Accordingly, the Sub-committee feels that there is no need for any form of tourist development to take place within the reserves, in fact such development would be undesirable. Accommodation for visitors is supplied in the adjacent towns.

Location: 32°25' - 33°0' S
116°25' - 33°0' E

State of Reservation:

State Forest No. 51

State Forest No. 53

20338: Timber.

20610: Timber.

A 11144: Parkland. Class A.

19128: Timber.

19125: Timber.

25555: Flora and fauna. Vested Fauna Protection Advisory Committee of W.A. Class C.

19794: Timber.

12623: Cancelled.

18856: Timber.

16201: Water for Railway. Class C.

Area: 80,900 acres approx.

Literature: Calaby, J. (1960). — Observations on the banded ant-eater Myrmecobius f. fasciatus (Marsupialia), with particular reference to its food habits. Proc. zool. Soc. Lond. 1960 : 183-207.

Shortridge, G. C. (1936). — Field Notes (hitherto unpublished) on Western Australian mammals - South of the tropic of Capricorn. (Exclusive of Marsupialia and Monotremata), during the Balston Expedition (November 1904 to June 1907). Proc. zool. Soc. Lond. 1936 : 743-749.

Thomas, O. (1907). — List of further collections of mammals from Western Australia, including a series from Bernier Island, obtained by Mr. W. E. Balston; with field notes by the collector, Mr. G. C. Shortridge. Proc. zool. Soc. Lond. 1906 : 763-777.

Opinion: The Sub-committee is of the opinion that:

1. the reserves at Boyagin Rock and East Pingelly should be reclassified as Class A Reserves and that both should be vested in a Statutory Body as National Nature-Reserves;

2. the East Pingelly reserves should be set aside for the preservation of fauna and flora and that the main area of reserve at Boyagin Rock should be classified for the preservation of fauna and flora, while Class A Reserve No. A 11144 (parkland and picnic grounds) should be transferred to the control of the authority which controls the main reserve;

3. the Congelin water reserve No. 16201 (Class C) should be made a Class A Reserve for the preservation of fauna and flora, and its control should be vested in the same authority which controls the East Pingelly reserve and the Boyagin Rock reserve;

4. should the State Forest No. 51 or portions of it and the adjacent State Forest No. 53 be no longer required for purposes of forestry, they should be set aside for the preservation of fauna and flora;

5. these areas so reserved should together become a National Nature-Reserve to be maintained as natural bushlands (excepting the picnic ground A 11144 at Boyagin Rock) and that no further development should be permitted to take place within these reserves.

8.— SERPENTINE AREA

Jarrah (Eucalyptus marginata) and its associated flora forms the main vegetation cover of the Darling Range for many hundreds of miles in a strip inland of the Coastal Plain. E. marginata is the dominant tree species and mixed with it is Marri (E. calophylla), Blackbutt (E. patens), and Bullich (E. megacarpa). The under-storey consists of Dryandra, Banksia, Casuarina, Persoonia, etc., while the associated scrub consists of many species of Proteaceae, Papilionaceae, Myrtaceae and Goodeniaceae together with Xanthorrhoea, Macrozamia, Anigosanthos and many other species from a large number of families.

In spite of the fact that the Jarrah Forest and its fauna (as seen so close to Perth) is a major feature of the fauna and flora of Western Australia, there are no extensive biological reserves of it set aside as areas of natural bushland. However, much of the finest Jarrah country is at present within State Forests and catchment areas.

However, it is clear that much benefit could be gained by the presence in the jarrah belt of an untouched natural community in which natural conditions can be preserved and which would serve as a yardstick against

which can be compared the results of man's interference in other similar areas.

Location: $32^{\circ}30'$ - $32^{\circ}40'$ S
$116^{\circ}6'$ - $116^{\circ}29'$ E

State of Reservation:

Water Catchment Area.

Area: 86,400 acres approx.

Literature:

Hatch, A. B. (1959). — The effect of frequent burning on the Jarrah, Eucalyptus marginata, forest soils of W.A. J. roy. Soc. W. Aust. 42 : 97-100.

Williams, R. F. (1932). — An ecological analysis of the plant community of the Jarrah Region occurring on a small area near Darlington. J. roy. Soc. W. Aust. 18 : 105-122.

_____ (1944). — An ecological study near Beraking forest station. J. roy. Soc. W. Aust. 31 : 19-31.

Opinion: The Sub-committee is of the opinion that:

1. an area should be selected in one of the major catchment areas of the Darling Range, and it is further suggested that this be in the Serpentine water catchment area near Pinjarra;

2. should this area, or any part of it, be no longer required for the purposes of Jarrah forestry, the areas relinquished by the Forest Department be gazetted Class A Reserves for the preservation of fauna and flora and vested in a Statutory Body as a National Nature-Reserve.

9.— JOHN FORREST NATIONAL PARK

The John Forrest National Park is a small Class A Reserve of nearly 4,000 acres situated in the Darling Ranges in typical Jarrah forest on lateritic soils. To the south of it lies the extensive area of State Forests which stretch between Sawyers Valley and Collie.

Jarrah (E. marginata) predominates among the upper-storey while there is an admixture of Marri (E. calophylla) over the greater part of the Park. In the more clayey soils Wandoo (E. redunca var. elata) assumes a local dominance and in a few places occurs as a pure stand. The under-storey consists of Dryandra, Banksia, Casuarina, Persoonia, etc., while the scrub consists of many species of Proteaceae, Papilionaceae, Myrtaceae and Goodeniaceae, together with Xanthorrhoea, Macrozamia, Anigosanthos and many other species from a large number of families.

This Park was formerly rich in the natural flora of the Darling Range but because it is only 18 miles from Perth, it has now been extensively developed as a public recreational park and it is clear that still further development must be expected.

Ample facilities are available in this Park for parking of vehicles and picnics. There are tea rooms and facilities for bathing in a freshwater swimming pool.

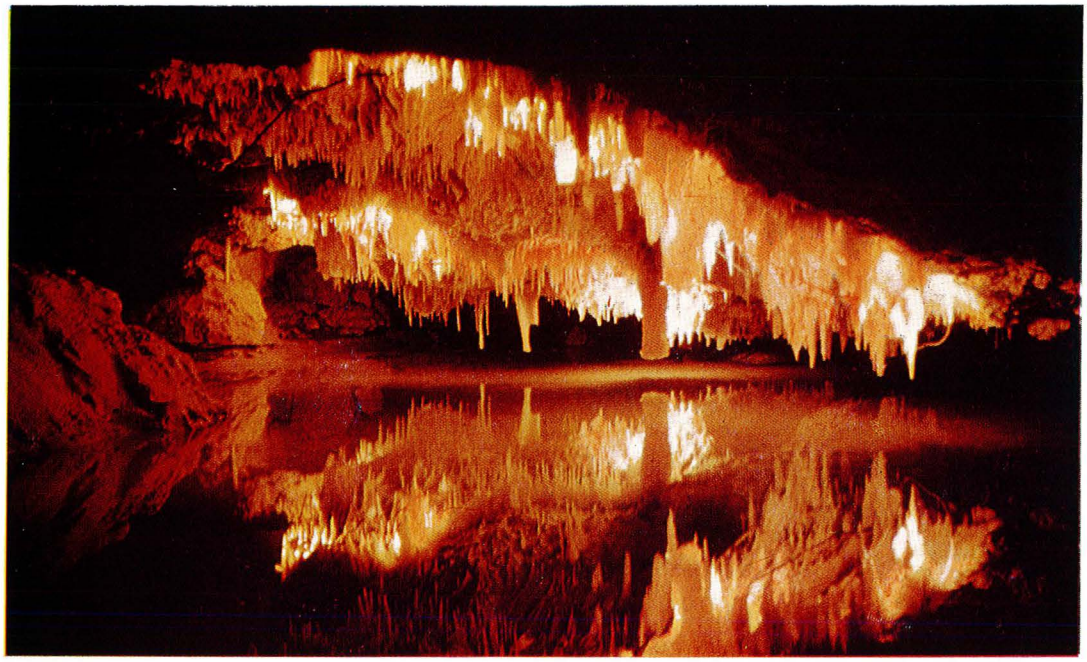
Location: 31°40' - 31°54' S
116°5' - 116°7' E

State of Reservation:

Class A Reserves (Nos. 2994, 2995, 7537, and 8164) for the purpose of National Parks. Vested in National Parks Board of Western Australia.

Area: 3,647 acres approx.

Literature: See p. 135 of this report.



The Jewel City, Crystal Cave, Yanchep Park

Opinion: The Sub-committee recommends that:

1. due to the proximity of this area to Perth it should continue to be developed as a recreational reserve;

2. some attention should be given to the retention of a reasonable area of bushland in this Park.

10.— YANCHEP PARK

Yanchep Park, an area of 6,000 acres, is placed in the Coastal Plain 32 miles north of Perth. It is a leading tourist attraction within easy reach of the city and lies in scenery typical of the dune systems of the Quaternary aeolianite.

Situated in the northern part of the range of Tuart Forest (Tuart occurs sporadically for nearly another hundred miles to the north), the vegetation is in marked contrast to that of the southern Tuart as exemplified in the Ludlow State Forest near Capel. In the north, the Tuart trees do not form a pure stand and the shrubby undergrowth is dense. This undergrowth consists of a large assemblage of species, particularly from the families Proteaceae, Myrtaceae and Papilionaceae. Speaking generally there are four main vegetation types in the Park. Their distribution is broadly governed by the depth of sand over the limestone. In the shallowest soil are found Blackboys (Xanthorrhoea sp.) with low harsh xerophytic shrubs; and with increasing depth of soil occur Tuart (E. gomphocephala) in small patches, Jarrah (E. marginata) with or without Marri (E. calophylla) and Banksia; and in the deepest soils coastal Blackbutt (E. todtiana) with several species of Banksias. Transitions between these four types occur and the Tuart-Jarrah-Marri is one of these.

The Park contains good tourist facilities in the form of a hotel, swimming pool, tearooms etc.; there is a small zoo of Australian animals and a natural lake

which has been developed for boating. There is also a golf course.

The Coastal Limestone in Yanchep Park contains underground caves which have been developed as a tourist attraction.

The Park comprising Reserve No. 9868 is under the control of the National Parks Board of Western Australia.

Location: $32^{\circ}30' - 32^{\circ}3'$ S
$115^{\circ}38' - 115^{\circ}42'$ E

State of Reservation:

Class A Reserve (No. 9868) for the Protection and Preservation of Caves and Flora and for a Health and Pleasure Resort. Vested in the National Parks Board of Western Australia.

Area: 6,070 acres approx.

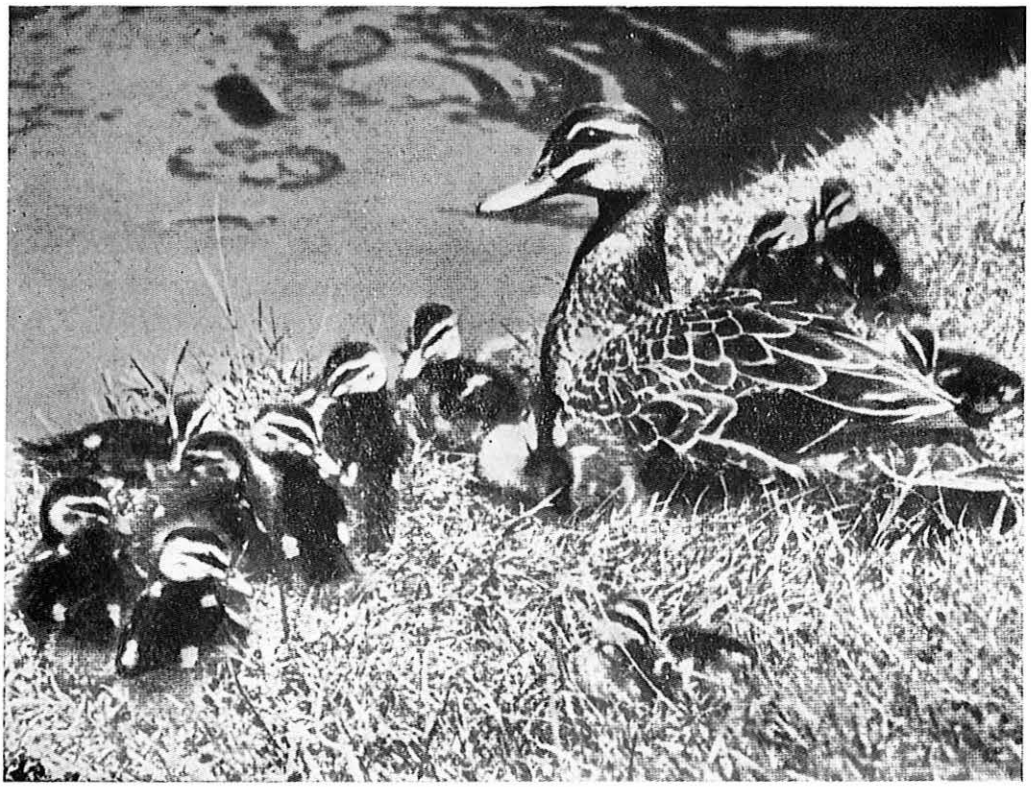
Literature:

Jenkins, C. F. H. (1964). — Yanchep National Park. J. Dept. Agric. W. Aust. 5 : 113-119. (Republished with appendices on Birds by C. F. H. Jenkins, and Flora by R. D. Royce, by the National Parks Board of Western Australia, 1964, pp.1-15.)

Milligan, A. W. (1903). — Notes on Lake Yanchep. Emu 3 : 20-22.

Opinion: The Sub-committee is of the opinion that:

1. an expert committee should be set up to make recommendations on the sub-division of the Park into areas to be classified by legislation as either Class A Reserves for the preservation of flora and fauna, or Class A Reserves for public recreation;



Black Ducklings at Yanchep Park

Grey Butcher Birds at Yanchep Park

2. the part of the whole area set aside for the preservation of fauna and flora should be classified as a National Nature-Reserve (of Northern Tuart).

11.— LAKE MAGENTA RESERVE

This Class A Reserve for the preservation of fauna and flora comprises about 233,000 acres, and contains a fine example of the Sclerophyllous Woodland typical of the more arid southern parts of the State. The Reserve is vested in the Fauna Protection Advisory Committee, and was originally set aside by the Under Secretary for Lands, on the endorsement of the Fauna Protection Advisory Committee of Western Australia, as a reserve for Mallee Fowl and other Mallee fauna.

The Reserve appears to be a stronghold of several other characteristic Mallee bird species whose habitat is being diminished in other parts of the State owing to progressive clearing and other disturbances of close settlement. In a brief survey in 1953, made by a party led by Dr. D. L. Serventy, a list of 51 bird species was compiled of which special mention may be made of the following: Southern Scrub Robin (Drymodes brunneopygia) - almost confined to Mallee areas. Shy Ground Wren (Hylacola cauta) - also confined to Mallee areas and now very rarely seen in its previous haunts in the wheat belt. Blue-breasted Wren (Malurus pulcherrimus) - characteristic of the Mallee and, in former times, regarded as one of the rarest Blue Wrens; it was encountered several times in the area. Rufous Tree Creeper (Climacteris rufa) - a eucalypt woodland species once common but which is now disappearing from a large portion of the South-west. Purple-gaped Honeyeater (Meliphaga cratitia) - a Mallee honeyeater of restricted range in Western Australia; it is well distributed in the area under review.

Marsupials in the area include the Honey Possum (Tarsipes spenserae), and the Red-tailed Wambenger (Phascogale calura).

The Reserve also has the following Mallee eucalypts within its boundaries - Eucalyptus spathulata, E. oleosa, E. cylindriflora and E. astringens.

The area contains a good example of a salt lake with gypsum dunes on the lee side and a lake floor of crystalline gypsum, clay and salts. The area has been mapped as Precambrian gneiss.

The Reserve will clearly provide an invaluable yardstick against which to measure the changes brought about by Man in adjacent farming areas in this low rainfall part of Western Australia.

Location: 33°19' - 33°30' S
118°48' - 119°12' E

State of Reservation:

Class A Reserve No. 25113 for the preservation of flora and fauna. Vested in the Fauna Protection Advisory Committee of Western Australia.

Area: 233,000 acres approx.

Literature: None known.

Opinion: The Sub-committee is of the opinion that:

1. Class A Reserve No. 25113 set aside for the preservation of flora and fauna should remain set aside for this purpose and vested in the Fauna Protection Advisory Committee or its successor having control of other National Nature-Reserves;

2. this area should be a National Nature-Reserve and to remain forever as natural bushland.

12.— FITZGERALD RIVER RESERVE

The Reserve at the Fitzgerald River is of 604,000 acres and was established in 1954 because of the high degree of endemism in the flora of this particular place. The richest flora in the Reserve is found along the Fitzgerald River and a tributary, the Coppermine Creek, where there are quite a number of plants not found in any other part of the world. The total number of endemic plants in the Reserve is estimated by Mr. C. A. Gardner as being about 25.

This Reserve contains magnificent coastal scenery. The Fitzgerald River rises in an area of gneissose rocks and flows south-easterly through a belt of horizontally bedded Eocene rocks (Plantagenet Beds) emerging at Fitzgerald Inlet which is flanked by Proterozoic metasediments of the Stirling-Barren series. The river cuts through the Barren Range at a point a little to the southwest of Middle Mount Barren, a 1500 foot peak in the range.

The Reserve is at present a Class C Reserve for the preservation of fauna and flora and is not vested in any body.

There is no tourist development in the area, but the Reserve is easily accessible from Ravensthorpe and, at one point, the Reserve reaches the Ravensthorpe-Ongerup road.

Location: $33^{\circ}46'$ - $34^{\circ}28'$ S
119° - 120° E

State of Reservation:

Class C Reserve (No. 24048) for the preservation of flora and fauna, together with proposed area adjacent to the Reserve on the eastern end of it.

Area: 604,000 acres approx.

Literature: Sofoulis, J. (1958). — The geology of the Phillips River Goldfield, W.A. Bull. Geol. Surv. W.A. No. 110.

Opinion: The Sub-committee is of the opinion that:

1. Class C Reserve No. 24048 should be reclassified as a Class A Reserve for preservation of fauna and flora;

2. an additional area to the east of the Reserve should be set aside and classified Class A for public recreation;

3. both areas together should be vested in a single Statutory Body as a National Park - this Body having control of other National Parks and National Nature-Reserves.

13.— TOODYAY, STATE FOREST NO. 61

State Forest No. 61 is, biologically, an important area because it is typical of northern Jarrah and the Wandoo forest which is found within it, and in this particular area it remains in very nearly its original condition. The area has been mapped as being composed of Precambrian metasediments.

Wandoo forest provides some of the most important faunal areas of the South-west. Wandoo (E. redunca var. elata) is frequently termite eaten and both the termites themselves and the hollows which they create are used by the animals for food and refuge. Mammals which occur in the area include such forms as the tree-living bats Chalinolobus gouldi and Tadarida australis, possums Trichosurus vulpecula and Cercaertus concinnus and the Quenda Isoodon obesulus.

This State forest is situated close to the town of Toodyay, one of the State's oldest agricultural settlements, and possessing a number of places of historic interest. Toodyay is only 53 miles from Perth

and is served by regular bus services and a railway. There are good access roads to the State forest.

Location: 31°20' - 31°31' S
116°7' - 116°18' E

State of Reservation:

State Forest No. 61.

Area: 84,268 acres approx.

Literature:

McWhae, J. R. H. (1948). — The Geology and Physiography of the Lawnswood area. J. roy. Soc. W. Aust. 32 : 49-74.

Prider, R. T. (1934). — The geology and physiography of Jimperding area. J. roy. Soc. W. Aust. 20 : 1-16.

_____ (1941-42). — The petrology of part of the Toodyay District, W.A. J. roy. Soc. W. Aust. 28 : 83-137.

Opinion: The Sub-committee is of the opinion that:

1. should it no longer become necessary to retain this area (or any part of it) for the purpose of forestry, the parts relinquished by the Forest Department should be gazetted Class A Reserves for the preservation of fauna and flora and vested in a Statutory Body;

2. the Forest Department should be approached immediately by the Chief Warden of Fauna with a view to securing an immediate agreement that this Forest continue to carry species of trees natural to the area and it should not be planted with alien species.

14.— MURCHISON RIVER RESERVE

The Murchison River area is of great interest to biologists and geologists, and in addition contains many scenic features to attract tourists. Part of the area at present comprises a Class C Reserve for the preservation of flora and fauna, and it is important that this be converted to a Class A Reserve and extended to include most of the gorge of the Murchison River and part of the coast. Features of the area are as follows:

The Murchison River Gorge:

The gorge of the Murchison River is one of the most remarkable physiographic features of Western Australia. It extends for some 50 miles along the river from near Bettie Crossing to Hardabut Pool, and is extremely rugged and picturesque. The gorge is more than 500 feet deep, and is cut into the Tumblagooda Sandstone, a vivid red formation of Silurian or Ordovician age. Gently rolling sand-plain country stretches for miles on either side of the gorge, and the abruptness with which the gorge is incised into the plain is most striking.

In late Tertiary, or perhaps early Pleistocene times, the Murchison River meandered over a flat plain close to sea level. Abrupt uplift of the area then occurred, amounting to about 600 feet, and caused the river to cut down deeply into its old meandering bed in order to maintain its course. This has resulted in the gorge, with its spectacular incised meanders, of which "The Loop" is the most impressive. The Tumblagooda Sandstone is cut by many major joints, and tributary canyons follow these, resulting in a remarkable drainage pattern.

The only large trees in the area occur in the gorge, of which attractive river gums are the most common. The gorge also contains a number of endemic plants.

Permanent water, most of which is brackish, occurs in pools along the gorge. These pools attract many ducks, black swans, herons, and other birds, and

Red Kangaroo

are well stocked with fish. Kangaroos and emus are abundant, and many of the smaller, shy marsupials probably occur.

The beauty of the gorge, with its towering red cliffs, crystal-clear pools, trees, and wildlife, is unsurpassed in south-western Australia. There can be no doubt that once suitable roads are constructed and facilities provided, it will develop into a great tourist attraction. At present very few people ever visit the gorge, owing to the lack of roads, and as a result it is still virtually in an untouched state. It is very important that the gorge be included as a Class A Reserve, so that its development can be properly controlled, allowing its natural beauty to be preserved for posterity.

The Sand-Plain:

Most of the present Class C Reserve is occupied by gently undulating sand-plain, covered by unspoiled heath vegetation of considerable botanical interest. Three distinct types of flora are recognised in the area - the predominant sand heath, the flora of the laterite towards the eastern end of the Reserve, and the flora of the Coastal Limestone. There is a high degree of endemism in the flora of the Reserve. It is rich in the endemic elements of the north, principally with regard to the species of Banksia, other Proteaceae, and certain Myrtaceae, which are not found elsewhere. The sand heath is a blaze of flowers in the spring and early summer.

The sand-plain is underlain by laterite resting on Cretaceous sediments (especially the Thirindine Formation) or the Tumblagooda Sandstone. Exposures of Cretaceous chalk are conspicuous just outside the limits of the Reserve.

The Coastal Cliffs:

At present the coastal cliffs are excluded from the existing Class C Reserve, but it is recommended that the proposed National Park should include the strip of coast between Bluff Point (where the rabbit-proof

fence meets the coast) and Wittecarra Gully. The coastal scenery in this area is magnificent. The coast from Red Bluff to Bluff Point is formed by precipitous cliffs, which are beautifully coloured in yellow, bright red, and white. They are composed of Coastal Limestone, Tumblagooda Sandstone, and the Wittecarra Formation, which is probably Jurassic in age. The type section of the Wittecarra Formation occurs in the area, near Nancy Beach, one of the few places where the cliffs can be scaled.

Wittecarra Gully is one of the most important historical localities in Western Australia. This probably is the place where Commodore Pelsaert marooned two of the conspirators from the 'BATAVIA' in 1629. These two men were the first known white inhabitants of Australia, and Mrs. Daisy Bates suggested that the distinctly European features of some of the Aborigines of the Murchison area may be traceable to these Dutchmen. However, it is perhaps more likely that these Aborigines included among their forebears survivors of the wreck of the Dutch ship 'ZUYTDORP', which was wrecked near here in 1712. The Dutch navigator Vlamingh also landed at Wittecarra Gully in 1696, and replenished his fresh water supplies there. The explorer Lieutenant Grey and his party were wrecked beside Wittecarra Gully in 1838, and set out from here on their long walk to Perth.

Kalbarri:

The town of Kalbarri is situated on the estuary of the Murchison River near its mouth. The estuary is only rarely closed with a bar, but the tortuous, reefed entrance is such that it can only be used by small craft. The township is a crayfishing and tourist centre, being especially popular with amateur fishermen. Cottages and cabins with reasonable amenities, including electricity, are now available, and there is also a camping and caravan park. The township is outside the proposed reserve, but it is recommended that a smaller reserve be set up adjacent to the town for camping purposes. It is anticipated that most of the tourists who will visit the proposed National Park will be accommodated at Kalbarri.

Location: 27°33' - 27°53' S
114°4' - 114°43' E

State of Reservation:

24050: Class C for the preservation of flora and fauna. Not vested.

24686: Class C for the preservation of flora and fauna. Not vested.

Unreserved land to the north.

The following leases and locations to be resumed:

Leases 142/235,000 and 392/520;
Locs. 7055, 7067, 7068, 6865, 7046, 7200.

643: Class C for water and stopping place.

Area: 358,000 acres approx.

Literature:

Buller, K. G. (1950). — Bird notes from the mouth of the Murchison River. W. Aust. Nat. 2 : 82-3.

Clarke, E. de C., and Teichert, C. (1948). — Cretaceous stratigraphy of the lower Murchison River area, Western Australia. J. roy. Soc. W. Aust. 32 : 19-47.

Johnstone, D., Condon, M.A. and Playford, P. E. (1958). — Stratigraphy of the lower Murchison River area and Yaringa North Station, Western Australia. J. roy. Soc. W. Aust. 41 : 13-16.

Mellor, J. W. (1921). — Upon the Murchison. Emu 20 : 137-139.

Shipway, B. (1950). — Notes on the equatic natural history of the Lower Murchison River. W. Aust. Nat. 2 : 73-77.

Opinion: The Sub-committee is of the opinion that:

1. the present Murchison River Reserve should be gazetted as a Glass A Reserve for the preservation of flora and fauna, to be vested in a Statutory Body;

2. the boundaries of the Reserve should be extended so as to include most of the Murchison River Gorge, and the coastal strip from Wittecarra Gully to Bluff Point;

3. an area adjacent to Kalbarri townsite should be reserved as a Class A Reserve for camping, to supplement the private accommodation available in the town;

4. this camping Reserve should be vested in the same Statutory Body as the flora and fauna Reserve;

5. the whole should comprise a National Park to be vested in the same Statutory Body which controls other National Parks.

15.— MT. LESUEUR RESERVES

The country in the vicinity of Jurien Bay and Mt. Lesueur (i.e. some 130 miles to the north of Perth) is of great biological interest. It is in the northern part of the strip of Coastal Limestone which is an important feature of the western part of the South-western coastline and in the Jurien Bay area provides an interesting contrast with areas of Coastal Limestone which are proposed as reserves in the higher rainfall areas further to the South. (See Margaret River-Hamelin Bay Area).

At Jurien Bay the Coastal Limestone lies adjacent to Jurassic sediments which consist of marine and continental sandstones, siltstones, shales and limestones, strongly faulted and capped by laterite. As the same country does further south, the Coastal Limestone here contains caves which are palaeo-biologically important because of the interesting mammal fossils which they contain.

This area of country contains a number of important Class C Reserves which have been set aside for various purposes and the Sub-committee considers that it would be desirable to unify these in order to increase their effectiveness as biological reserves. In addition, because the country is scenically attractive, the Sub-committee considers that these should together form a National Park.

Most of the area which has been selected to be included in the proposed National Park is in the Coastal Limestone belt and consists of modern sand dunes, vegetated and stable dune systems of the Pleistocene and sub-Recent, and outcropping areas of aeolianite. There is little fresh water in this coastal part of the proposed National Park and the vegetation is varied, and is fully representative of this part of the Coastal Plain.

On the other hand, Mt. Lesueur (which was named by the French biologist-explorer Peron early in the 19th century) and the country immediately north of

it comprises reserves which are in the hilly country which is formed by the Jurassic sediments. Here there are deep watercourses which are the headwaters of Cockleshell Gully and a part of the Hill River system. This part of the reserve carries a very distinctive endemic flora and at least five of the plants which grow here are found nowhere else in the world. These are Banksia tricuspis, Asterolasia phlebalioides, Hakea megalosperma, Hakea neurophylla, Darwinia helichrysoides. This reserve is also the habitat of the unique land-shell, the native snail Bothriembryon inflatus.

The area immediately surrounding Mt. Lesueur and a similar, but isolated, reserve to the southeast of it are at present vested in the University of Western Australia as Class C Reserves for educational purposes, the remainder are not vested. The height of Mt. Lesueur is 1,021 feet.

Location: 29°30' - 30°18' S
114°59' - 115°18' E

State of Reservation:

Reserve No.	Location	Purpose
24496	1004; 7142; 6655; 7138; 8441; 10003; 10200; 10191; 8345	Protection of flora. Class C.
22523	9757	Camping and water.
15018	3407	Horse breeding.
485		Public purposes.
18865		Excepted from sale.
25471	10551	Sanitary site. Rubbish depot.

24275	10385	Educational purposes. Vested University of Western Australia. Class C.
24276	10386; 10563	Educational purposes. Vested University of Western Australia. Class C.
24437	10412	Water and camping.
11879		Trig. Station SYG.
11881		Trig. Station IB.
11882		Trig. Station ES.
11883		Trig. Station PH.
11886		Trig. Station CS.
11887		Trig. Station MB.
11901		Trig. Station JB.
11845		Trig. Station WW.
11846		Trig. Station WC.
11880		Trig. Station GL.

Alienated Locations

824	Crown Grant.
976	Crown Grant.

Mineral Claim 714H

Vacant Locations

Pt. of 10602	Vacant.

Area: 230,844 acres approx.

Literature:

Brown, H. Y. L. (1873). — General report on a geological exploration of that portion of the Colony of Western Australia lying southward of the Murchison River and westward of Esperance Bay. Votes and Proceedings of W.A. Parl. 1873. Paper No. 1.

Gardner, C. A. (1947). — The botany of the Hill River District. W. Aust. Nat. I : 1-6.

Lundelius, E. (1960). — Post Pleistocene faunal succession in Western Australia and its climatic interpretation. Rept. Int. Geol. Congress 21 Session. Pt. IV : 142-153.

Opinion:

The Sub-committee is of the opinion that:

1. the areas of land listed above should be gazetted as Class A Reserves;

2. all of this area with the exception of Reserve No. 24276 (i.e., the small isolated reserve to the south-east of Mt. Lesueur) should be vested in a Statutory Body having control of other National Parks as a National Park;

3. Reserve No. 24276 should remain vested in the University of Western Australia for educational purposes;

4. an expert committee should be set up to recommend the subdivision of the area into reserves for public recreation and reserves for the protection of fauna and flora; those to be set aside for public recreation should not exceed one-tenth of the entire area.

16.— HOUTMAN ABROLHOS RESERVE

The archipelago of Houtman Abrolhos lies in the Indian Ocean about 30 miles off the coast of Western Australia in the vicinity of Geraldton. The islands are small and low, and are the remnants of a coastal dune system which became inundated during the Recent rise in sea level. They vary only a few feet above sea level in the Southern Group to approximately 40 feet on North Island. The waters around the islands are very clear, and between them are extensive reef systems with submerged reefs, niggerheads, and deep lagoons. These reefs support luxuriant coral growth and an abundant tropical marine fauna.

The islands are without trees except for a copse of eucalypts on East Wallabi Island; however, many are clothed with low scrub and are fringed with mangroves. Good swimming beaches are few except on the southern end of Pelsart Island. Fishing is excellent. Some of the islands have been extensively worked for guano and the scars of these workings are obvious.

The archipelago comprises the rather isolated North Island and three groups of islands. From north to south these are the Wallabi Group, the Easter Group and the Southern Group.

The Abrolhos were first discovered by Dutch mariners sailing from the Cape of Good Hope to the Indies and it is probable that a number of Dutch ships were wrecked on their dangerous reefs. It is well known that these islands were the scene of the wreck of the Dutch ship 'BATAVIA' in 1629 and the subsequent mutiny of the crew followed by a massacre of the survivors. The Dutch vessel 'ZEEWYCK' is also known to have been wrecked there in 1727. In more recent times, numbers of vessels, both steam and sail, have been wrecked on the Abrolhos.

Biologically, these islands are important. They are certainly the main breeding place of sea birds off the western coast of Australia. They also have a

particular zoogeographic significance in that they are the southernmost breeding grounds of certain tropical species.

The avifauna includes colonies of several species of Shearwaters and many terns. The Lesser Noddy, Anous tenuirostris melanops Gould, is a bird which breeds only in the Abrolhos and so is the shag Phalacrocora varius nitidus Serventy. There are only a few species of land birds. The islands are the northernmost place at which the Brush Bronzewing, Phaps elegans occurs and they also have an endemic scrub wren, Sericornis maculatus houtmanensis Zeitz, and an endemic form of the Painted Quail, Turnix varia scintillens Gould, which used to be plentiful on North Island. This quail has recently probably become extinct there (Storr 1960), so that now it is confined to East and West Wallabi Islands. The land birds are particularly susceptible to human interference and the recent disappearance of at least two species from North Island (Brush Bronzewing and Painted Quail) shows that the danger of extinction is acute.

West Wallabi Island has a diversified flora (e.g. Pittosporum, Grevillea, Capparis, Sarcostemma) as a result of the presence of guano. The terrestrial fauna is diverse and populations of all species are dense. There are nine species of gecko (some inland species), Carpet Snakes (Morelia variegata Gray), an endemic rat (Rattus glauerti), great numbers of Abrolhos Dragon Lizards (Amphibolurus barbatus minimus), and the Abrolhos Tammar Wallaby (Protemnodon eugenii binoe). The Abrolhos Tammar Wallaby also occurs on East Wallabi Island. This biological diversity and great numbers of individuals interacting as predators and prey (e.g. Sea Eagles and small vertebrates; wallabies and vegetation) makes West Wallabi Island unique and requires its preservation as an area of natural bushland.

The waters surrounding the Houtman Abrolhos are perhaps the most important Western Australian fishing grounds, and fishermen visit and live on these islands (particularly West Wallabi Island) during the crayfishing season. This has produced problems, since some fishermen have attempted to introduce some alien species to the

islands (e.g. rabbits) and some have even tried to use wallabies for cray-bait.

There are now no tourist facilities on any of the islands, but there are a great number of fishermen's huts. As the value to the fishermen of crayfish produced in the Abrolhos Island area in 1961 was not much less than £1,000,000 it would be clearly ridiculous to request their removal. Buildings erected on the south-end of Pelsart Island by the British Phosphate Commission in 1943 were used for a short period after the War as a tourist camp. However, that venture failed and through pilfering and neglect only the remnants of the camp now remain. While Pelsart Island has a good swimming beach and remnants of the British Phosphate Commission's landing facilities, the absence of fresh water limits its tourist potential. This is fortunate from a biological view, for this Island is easily the most important bird island in the Group and probably on the coast. Various attempts have been made to exploit the latent tourist potential of these islands but all have ended in failure. The most recent was a fishing cruise which operated from Geraldton but it too failed.

North Island, the Wallabi Islands, the Easter and Pelsart Groups are at present Class A Reserves (No. A 20253) set aside as public recreation and tourist resorts and vested in the Trustees of the Houtman Abrolhos (vide Government Gazette 6.12.57/3504), but the Sub-committee feels that there is a strong case for making this outstanding island group a National Park and vesting it in the same Statutory Body which controls other National Parks.

Location: $28^{\circ}18' - 28^{\circ}59'$ S
$113^{\circ}37' - 130^{\circ}58'$ E

State of Reservation:

Class A Reserve (No. 20253) for public recreation and tourist resort. Vested in the Trustees of the Houtman Abrolhos.

Area: Total area unknown.

West Wallabi Island - 1,500 acres approx.
East Wallabi Island - 930 acres "

Literature:

Alexander, W. B. (1922). — The Vertebrate Fauna of Houtman's Abrolhos (Abrolhos Islands), Western Australia. J. Linn. Soc. (Zoology) 34 : 457-486.

Dakin, W. J. (1919). — The Percy Sladen Trust Expedition to the Abrolhos Islands (Indian Ocean). Report I. J. Linn. Soc. (Zoology) 34 : 127-180.

Drake-Brockman, H. and E. D. Drok. (1963). — Voyage to Disaster (The "Batavia" Mutiny).

Storr, G. M. (1960). — The physiography, vegetation and vertebrate fauna of North Island, Houtman Abrolhos. J. roy. Soc. W. Aust. 43 : 59-62.

Teichert, C. (1947). — Contributions to the geology of Houtman's Abrolhos, Western Australia. Proc. Linn. Soc. N.S.W. 71 : 145-196.

For a bibliography of papers on Abrolhos birds see Whittell, H. M. (1949). Emu 49 : 71-72.

Opinion:

The Sub-committee is of the opinion that:

1. the Trustees of the Houtman Abrolhos Islands should be asked to relinquish control of the Class A Reserve No. 20253 (Houtman Abrolhos);

2. North Island, East and West Wallabi Islands, the southern part of Pelsart Island and Wooded Island should be reserved for the conservation of flora and fauna. The remainder of Pelsart Island and some of the islands on which few shacks are yet built could be reserved for recreation and developed when the water problems have been overcome;

3. the remainder of the islands should be surveyed by an expert committee to decide whether they should remain classified for public recreation, changed to the preservation of flora and fauna, or earmarked for further development in connection with the crayfishing industry;

4. the whole should become a National Park and vested in a Statutory Body controlling other National Parks.

17.— ROTTNEST ISLAND RESERVE

Rottnest Island formed a high point in the Pleistocene dune system which now lies drowned off the coast of Western Australia in the vicinity of Fremantle. It lies on the Continental Shelf on the western flank of the Perth Basin and is mapped as being composed of Quaternary aeolianite with marine bands.

The Island has links with the earliest recorded history of Western Australia. It was discovered in 1658 by the Dutch navigator Volkersen, and visited and named by Vlamingh in 1697 and it was further explored by the French expedition under Baudin in 1801.

The Island was occupied by some of the colony's first settlers in 1830, but they vacated their grants when the land was resumed in 1838 so that the Island could become a prison for aboriginal offenders. Most of the old buildings which stand on the Island today were erected in the 1840's and 1850's for use in connection with the penal settlement. Today these buildings, painted with the characteristic Rottnest yellow so appropriate in their setting, fortunately remain largely untouched and give the settlement a peculiar charm.

Since the first European landed on the Island, the vegetation of Rottnest has been changed considerably, particularly as to the relative proportions of species. This has been the result of burning, clearing and grazing. The greater part of the centre of the Island has been denuded of its originally extensive tree cover and is now dominated by a Stipa-Acanthocarpus steppe. Remnants of the original vegetation cover are only to be found in the vicinity of the West End, around the lakes, and on the several capes of the northern and southern coasts.

The plant communities which are now found on Rottnest are the Melaleuca-Callitris forest, the Acacia scrub associations, and the Stipa, the coastal, and the halophytic associations. The vegetation of the Island provides an excellent study of the effects of interference and the capacity of various species to react to this disturbance of their equilibrium.

The fauna of the Island is particularly interesting because of the presence of a large and flourishing population of the small marsupial Setonix brachyurus, the Quokka. This small wallaby has, as a result of the work of the Department of Zoology in the University of Western Australia, become one of the scientifically best known Australian native animals. Because of the proximity of the Island to Perth, it is a most important natural laboratory for the study of wild-life as well as being a popular holiday resort.

The marine life of the coasts of the Island is also of great interest to biologists and it is the southern limit of the distribution of many of the northern species in our marine fauna.

Tourist facilities on the Island include a hotel, hostel, cottages and bungalows for hire and various other tourist facilities. Fresh water is available from a small catchment area but is not abundant. There are regular boat and air services to and from the mainland and there are sporting facilities. It is a popular tourist resort.

Recent developments on Rottnest Island have shown that the Island, like the majority of other major reserves in Western Australia, should be zoned in such

a way that the best interests both of public recreation in a wild life setting, and the native fauna, are protected.

Location: 32° S
115°30' E

State of Reservation:

Class A Reserve (No. 16713) for recreation. Vested in the Rottnest Island Board.

Area: 4,726 acres approx. (Excluding Commonwealth Leases).

Literature:

Churchill, D. M. (1960). — Late Quaternary changes in the Vegetation on Rottnest Island. W. Aust. Nat. 7 : 160-166.

Hodgkin, E. P. and Sheard, K. (1959). — "Rottnest Island: The Rottnest Biological Station and Recent Scientific Research". J. roy. Soc. W. Aust. 42 : Pt. 3 : 65-95.

McArthur, W. M. (1959). — Plant ecology of coastal islands near Fremantle, W.A. J. roy. Soc. W. Aust. 40 : 46-64.

Teichert, C. (1950). — "Late Quaternary changes of sea-level at Rottnest Island, Western Australia". Proc. roy. Soc. Vict. 59 : 63-78.

Opinion: The Sub-committee draws the attention of the Rottnest Island Board to the fact that the natural setting of bush and its fauna forms an important part of the charm of this island holiday resort and merits preservation.

The Sub-committee is of the opinion that an expert committee should be set up to

select areas on the island which should be gazetted Class A Reserves for the preservation of fauna and flora and vested in an authority competent to provide adequate biological management in order to ensure the rehabilitation and continuation of the natural fauna and flora.

18.— GARDEN ISLAND

Garden Island is part of the same drowned dune landscape as Rottnest Island (No. 17).

The vegetation of this Island is remarkable for three reasons: Firstly, certain important families of the mainland are either absent (Proteaceae), or present in restricted numbers (Myrtaceae and Papilionaceae). Secondly, the dominant species present show an unusually high frequency, five-sixths of the area of the Island being covered by dense scrub formed by Acacia rostellifera, Callitris robusta and Melaleuca huegelii. The third unusual feature of this vegetation is its structure which is probably unique in Western Australia; in particular, in many cases the scrub consists of a single storey of dominants in contrast to the three distinct storeys found in the Eucalyptus marginata and E. gomphocephala communities of the mainland. The closed canopy of the Island vegetation serves further to distinguish it from any other community.

The fauna of Garden Island is of particular interest because it, like Rottnest, also harbours a wallaby but in this case a very different species. The species on Garden Island is the Tammar Protemnodon eugenii, a wallaby which is now sparsely distributed on the mainland but occurs as a very dense population on this Island. This species is the same as that which occurs on some of the islands of the Abrolhos and the Recherche, but each of the

populations appears to be slightly different from the other and a close study of these populations is expected to yield important information on the evolution of wallaby species on small islands.

There is a regular launch service to and from Rockingham Jetty and Palm Beach. The Island has 44 cottages for hire and two large accommodation blocks in addition to camping areas. Electricity is available, and there is a store and tearooms. A telephone service also extends to the Island. It is a popular holiday resort with swimming, boating and fishing the main attractions.

The Island is at present held freehold by the Commonwealth but is under lease from the Commonwealth to the Garden Island Development Company.

Because the Island is small, and tourist development is bound to occur haphazardly to the detriment of the bushland unless rigidly controlled, the time will come when the area available to the population of wallabies is so small that it can no longer support both the natural bush and the fauna. Biologists and nature lovers agree that this would be a tragedy. There are thus excellent reasons for providing for the legal separation, preservation and management, of natural bush areas on the Island while there is yet time.

Location: 32°14' S
115°41' E

State of Reservation:

Held freehold by the Commonwealth.

Area: 2,800 acres approx.

Literature:

Baird, A. M. (1958). — Notes on the regeneration of vegetation of Garden Island after the 1956 fire. J. roy. Soc. W. Aust. 41 : 102-107.

Buller, K. G. (1949). — Land-Birds of Garden Island. W. Aust. Nat. 2 : 48.

McArthur, W. M. (1957). — Plant ecology of coastal islands near Fremantle, W.A. J. roy. Soc. W. Aust. 40 : 46-64.

Opinion: The Sub-committee is of the opinion that an expert committee should be set up to select areas on the Island which should be gazetted Class A Reserves for the preservation of fauna and flora and vested in an authority competent to provide adequate biological management in order to ensure the continuation of the natural fauna and flora.

The Sub-committee notes that the natural bushland setting forms an important part of the charm of this Island.

19.— BALD ISLAND RESERVE

Bald Island is a small island of approximately 2,000 acres mapped as granite gneiss and lies approximately 15 miles to the east of Two Peoples Bay near Albany. It became separated from the mainland during the late Pleistocene. On its south and west sides cliffs rise steeply out of the sea and the highest point of the island is at its centre. This reaches approximately 1,020 feet.

Bald Island is at present a Class C Reserve for the preservation of fauna and flora (No. 25869) and is not vested. It has been visited upon several occasions by zoologists from the Department of Zoology, University of Western Australia under the leadership of Dr. A. R. Main. These visits have resulted in the accumulation of many data on the biology of this island which is clearly of outstanding scientific interest.

From the biologist's point of view the vegetation is the most important feature of the island. This ranges from succulent mat, Tussock-land Heath, Peppermint Scrub, Marlock Forest, to Tea Tree Forest and it appears never to have been burnt; thus there is a deep accumulation of litter on the ground.

The mammals of the island are extremely interesting and comprise two species which are known on the mainland, i.e., the Quokka, Setonix brachyurus and a Bandicoot. The population of Quokkas on the island is of great biological importance because, although the species is the same as that which occurs on Rottnest Island, conditions are extremely different on this island and the populations provide an important comparison for research workers. In addition to the marsupials, a frog, Heleioporus australiacus, has also been collected on the island. This is a species which is only otherwise known from the clear temporary fresh-water streams of the Darling Ranges on the mainland.

Landing on the island is extremely difficult. Only two landing spots exist and these are on the north side. They can only be used when strong north-easterly winds flatten the swell.

Location: 30°53' S
120°28' E

State of Reservation:

Class C Reserve (No. 25869) for the preservation of flora and fauna. Not vested.

Area: 2,000 acres approx.

Literature: None known.

Opinion: The Sub-committee is of the opinion that:

1. Bald Island should be gazetted a Class A Reserve for the preservation of fauna and flora;

2. no part of it should be developed for recreation;

3. it should be vested as a National Nature-Reserve in a Statutory Body having control of other National Nature-Reserves to be preserved in perpetuity as natural bushland.

20.— RECHERCHE ARCHIPELAGO RESERVE

The Recherche Archipelago is a group of many small islands lying off the southern coast of Western Australia close to Esperance at the western end of the Australian Bight. The geology of the islands is fundamentally similar to that of the adjacent mainland and they are chiefly of granite or gneiss varying in size from low rocks of less than an acre to islands up to three miles long. The granite-gneiss islands are either devoid of vegetation or have patches of stunted scrub in places where soil has been accumulated in depressions in the granite. Other islands, particularly Christmas, Pasley, Figure of Eight, Salisbury, etc., have secondary deposits of limestone, sandstone, sand and soil overlying the granite. On these islands low grade phosphate rock or guano occurs.

Although the islands are strikingly similar geologically and botanically to the granite peaks which are such a feature of the adjoining mainland, the distribution pattern of plants among the islands is remarkable. Few of the 240 species recorded for the Archipelago occur on all the islands so far visited and many species are known only from one island. Moreover, some 8 species which are common in South Australia are known in Western Australia only from the islands of the Recherche Archipelago.

This general similarity to the mainland with a wide divergence between the individual islands, together with their affinities with South Australia, makes the islands important botanical reserves.

Fur Seals, Christmas Island Recherche Archipeligo (*Photo R. W. George*)

The fauna of the islands is also of great importance. They contain three species of marsupials, a Rock Wallaby, the Tammar, and a Bandicoot (which is believed to be closely related to a form found on islands at the eastern end of the Bight). As with the plants, the distribution of the animals is complex and not fully understood. For example, some of the islands carry one species of wallaby, while the others carry the other, and the interaction between animals and plants on these islands will repay close study. For example, Combe Island which is only of 240 acres supports a Rock Wallaby population and on it the interaction of nesting seabirds, vegetation, and the wallabies appears to be as simple and stable an ecological situation as has been described.

The Archipelago of the Recherche is one of the two reserves in Western Australia which has formed the basis of a biological survey and report (see Literature). There is thus sufficient basic information to provide a starting point for important biological work.

Nearly all the islands are steep and landings are difficult. In general, access is risky.

Names of the Islands are:

Bayliss Rock
Rug Rock
Whale Rock
Hector Rock
Canning I.
Burton Rocks
Smith Rock
Cook I.
Magistrate Rocks
Lion I.
Woody I.
Sandy Hook I.
Goose I.
Corbett I.
Hood I.
Cloud I.
Hastings I.
Rob I.
Finger I.
Figure of Eight I.
Fur Rock
Box I.
Fury Rock
Observatory I.
Taylor Rocks
Hendy I.
Rabbit I.
Limpet Rock
Black I.
Thomas I.
Long I.
Davy I.
Wilson I.
Round I.
Ram I.
New I.
Roy I.
Tory I.
Square Rock
Seal Rock
Capps I.
Giant Rocks
Grey Rocks
Charley I.
Button I.
Gull I.
Low Rock
Steep Rocks
Gunton I.
Remark I.
Bishop I.
Howe I.
Cliff I.
Pasco I.
Hope I.
Mondrain I.
Hugo I.

Pearson I.	Free I.	Passage I.
Station I.	Cornwall I.	Draper I.
York I.	Beaumont I.	Table I.
John I.	Nares I.	Marets I.
Sapper I.	Inshore I.	Taylor I.
Twin Peaks - North		
South		
Wedge I.	Tizard I.	Ben I.
Forest I.	Creek I.	Wharton I.
Cap I.	Combe I.	Manicom I.
Brewis I.	Glennie I.	Hasler I.
Helby I.	Ruby I.	Barrier Is.
Arid Is.	Daily Is.	Goose Is.
Douglas Is.	Gulch Is.	Owen Is.
George I.	Miles I.	Stanley I.
Middle I.	Dome I.	Pasley I.
Bellinger I.	Salisbury I.	Copper I.
Round I.	New Year I.	Draw I.
Eastern Group		

Location: $33^{\circ}37'$ - $34^{\circ}28'$ S
$121^{\circ}30'$ - $124^{\circ}10'$ E

State of Reservation:

Class C Reserve (No. 22796) for the preservation of flora and fauna. Not vested.

Area: Unknown.

Literature:

Bechervaise, J. M., Fairbridge, R. W., Serventy, V. N., Glauert, L., Main, B. Y., MacPherson, J. Hope (1954). — The Archipelago of the Recherche. Aust. Geog. Soc. Rept. No. 1.

Main, A. R. (1961). — The occurrence of Macropodidae on islands and its climatic and ecological implications. J. roy. Soc. W. Aust. 44 : 84-89.

Whitley, G. P. (1944). — Fire and Petrels: The mystery of Mondrain Island. Emu 44 : 6-7.

Wilson, A. F. (1958). — Advances in the knowledge of the structure and petrology of the Pre-cambrian Rocks of South Western Australia. J. roy. Soc. W. Aust. 41 : 57-83.

Woodward, H. P. (1908). — Annual Report of the Government Geologist for the year 1908. Division V of the Annual Report of the Mines Dept. 1908. Votes & Proceedings of W.A. Parl. 1909 (Report No. 1).

Opinion: The Sub-committee is of the opinion that:

1. the Islands of the Recherche Archipelago listed above should be re-gazetted Class A Reserves and vested in a Statutory Body having control of other National Parks;

2. the purpose of reservation of Charley Island, Gull Island, Middle Island, and Woody Island should be Public Recreation;

3. the purpose of reservation of all other Islands of the Archipelago should be the preservation of fauna and flora;

4. the whole should comprise a National Park.

21.— CAPE LE GRAND NATIONAL PARK

The National Park at Cape Le Grand is a Class A Reserve of 39,500 acres set aside for a National Park which is not vested.

Like the Islands of the Recherche Archipelago which are opposite the Cape, it is largely composed of Archaean granite/gneiss. This National Park which is so close to the townsite of Esperance was mainly established because of its great scenic beauty. The Cape was named after one of his seamen by the French explorer D'Entrecasteaux in 1792.

The fauna and flora of this Reserve (and that of Cape Arid to the east) are biologically important because they provide examples of a continental flora on simpler geological terrain in close proximity to the complex situation of the Islands of the Recherche. Cape Le Grand has one endemic species of Leptospermum which has not been found elsewhere in the world. The mammals of Cape Le Grand are poorly known but have considerable interest in that the Rock Wallaby which occurs on some of the Islands of the Recherche occurs in the rocky country at Lucky Bay. The Lucky Bay wallaby is supposed to be identical with the form which occurs on some of the Islands of the Recherche and the Lucky Bay and Island Rock Wallabies (Petrogale lateralis hacketti) are said to differ from the Rock Wallaby (P. l. lateralis) found elsewhere on the Western Australian mainland. The Reserve also contains the interesting marsupial species Tarsipes spenserae, the Honey Possum, which is unique to the south-west of Western Australia, and is an object of international scientific interest.

The National Park at Cape Le Grand was established primarily for development as a Tourist Resort but, as yet, there are no developed tourist facilities in the National Park. However, the National Park is within easy distance of the townsite of Esperance which is the seaside resort favoured by the residents of the Eastern Goldfields. Esperance is beautifully situated with excellent beaches which are sheltered by the Recherche Archipelago and swimming and fishing facilities are of a very high standard.

Location: $33^{\circ}53' - 34^{\circ}02'$ S
$122^{\circ}4' - 122^{\circ}19'$ E

State of Reservation:

Class A Reserve (No. 22795) for National Park. Not vested.

Area: 39,500 acres approx.

Literature: None known.

Opinion: The Sub-committee is of the opinion that:

1. a biological survey should be carried out of the Cape Le Grand National Park and following such survey, sufficient areas to ensure the preservation of flora and fauna for comparison with the fauna and flora of the Recherche should be gazetted as a Class A Reserve for the preservation of flora and fauna;

2. except for the provision of access roads and peripheral camping sites, the remaining area of the Reserve should be carefully developed to provide public access without spoiling its considerable natural beauty;

3. the area should be rescheduled a National Park and be vested in a Statutory Body having control of other National Parks or National Nature-Reserves.

22.— CAPE ARID RESERVE

The Cape Arid Reserve is situated between Cape Le Grand and Israelite Bay and is a Class C Reserve of 642,000 acres which is not vested.

This Reserve is of great botanical importance because it contains the flora which was examined by Robert Brown who accompanied Mathew Flinders on his exploration in 1801 and which, together with the flora of King George's Sound, formed the basis for his work in

Western Australia. The Reserve is the type locality of many of the species which arose out of Brown's work and is thus of outstanding importance.

The Cape Arid Reserve is one of those particularly rich areas in plant species on the south coast of Western Australia. Quite a number of plants are confined to the granitic headland and some of them are particularly attractive. In addition, the endemic species of the area number well over fifteen. Some of the plants of Cape Le Grand re-occur again at Cape Arid and the rocky areas of Cape Arid are of equal importance to the Cape Le Grand National Park in that they provide a basis of comparison with the island flora of the Recherche Archipelago. However, the Reserve extends far inland and embraces an important floristic community which is not represented to any extent in the Cape Le Grand National Park.

Location: 33°16' - 34°02' S
122°57' - 123°37' E

State of Reservation:

Class C Reserve (No. 24047) for the preservation of flora and fauna. Not vested.

Area: 642,000 acres approx.

Literature: None known.

Opinion: The Sub-committee is of the opinion that:

1. the Cape Arid Reserve (No. 24047) should be classified a Class A Reserve;

2. a biological survey on it should be made to determine the limits of the area or areas within its boundaries which could be set aside for public recreation and camping. The remaining area should continue as an area of natural bush set aside for the conservation of fauna and flora;

3. the whole area should be gazetted a National Park and vested in a Statutory Body having control of other National Parks.

23.— TWILIGHT COVE AREA

This area which the Sub-committee has selected for reservation at Twilight Cove includes a long coastal strip representative of both the high cliffs and the Western end of the Australian Bight and ocean beaches of the sandy plain in the vicinity of Eyre and Israelite Bay, together with a smaller area which extends inland across the Eyre Highway in the vicinity of Cocklebiddy Tank — a favourable stopping place for transcontinental travellers.

The Sub-committee recommends it as a reserve for two main biological reasons which are: First, that it represents a boundary zone between the Eremean (or Central Australian) and South Western flora and fauna. Second, because it will permanently preserve an area along the old coastal migration route of animals and plants between eastern and western Australia which was open at various times during the Pleistocene.

In years to come, this area will be of utmost importance because it will provide a yardstick against which to measure the changes which have been brought about in similar country by man's introductions and activities. It will also become an important collecting ground and laboratory for the scientific study of the east-west migration route. In addition the area will preserve a strip of the varied coastline with its biological entities.

The area is mapped as comprising Tertiary and Quaternary sediments and the south-western part of the Reserve contains examples of the high perpendicular

limestone cliffs typical of the Bight and the southern edge of the Hampton Tableland, while its southeastern section contains the edge of the Roe Plain with its coastal features. The almost horizontal Tertiary marine limestones of the Hampton Range contain richly fossiliferous beds.

The area is historically interesting because it was traversed by Eyre in his exploration of the coastline between west and south Australia and it is also of interest in that the telegraph station at Eyre, inundated by sand hills, still remains.

At the present time pastoral activity is extending into the country around the proposed reserve in the vicinity of Cocklebiddy. This Nature-Reserve will thus ensure that, along the East-West route there will be at least one area typical of the dry-country bushland which was traversed by the explorers. The reserve will also ensure that the ocean beaches of the Western end of the Roe Plain and the vicinity of Israelite Bay remain unspoiled by being kept free from haphazardly placed "cottages" and other holiday dwellings. In years to come travellers passing west from Cocklebiddy will pass through the reserve where it crosses the main highway and will gain firsthand experience of the natural bush as it was in the time of pioneers.

Location: 32° - $32^{\circ}23'$ S
$125^{\circ}8'$ - $126^{\circ}18'$ E

State of Reservation:

3806	Class C Reserve for camping (4,000 acres).
3805	Class C Reserve for camping (2,340 acres).
7095	Class C Reserve for water (3,000 acres).
682	Class C Reserve for camping (2,410 acres).
522	Class C Reserve for camping (150 acres).
	Remainder unreserved and unalienated land (1,251,200 acres).

Area: 1,263,100 acres approx.

Literature: Jennings, J. N. (1961). — A preliminary report on the Karst morphology of the Nullarbor Plain. Occ. Pap. Cave Exploration Grp. (S. Aust.) No. 2.

Opinion: The Sub-committee is of the opinion that:

1. the areas listed above should be gazetted a Class A Reserve and vested in a Statutory Body having control of other National Nature-Reserves and National Parks as a National Park;

2. the area of 249,400 acres extending north from Twilight Cove (and between Eyre and Billbinnia Rock Hole) should be set aside for the preservation of fauna and flora as a National Nature-Reserve; to serve as a natural yard-stick for comparison with adjacent pastoral areas;

3. an expert committee should be set up to examine the remaining area of the proposed National Park and to select appropriate areas for public recreation, the remainder should be set aside for the preservation of fauna and flora.

24. — BREMER RANGE AREA

This extremely dry area, lacking in fresh water, has been selected for recommendation as a National Nature-Reserve because it is representative of the halophytic botanical associations of the widespread salt lake systems of Western Australia. It is also close to the

boundary of the Eremean (Central Australian) flora and is an important area for botanical study. The area is a large one (576,000 acres) but the density of some species of the fauna and flora of desert environments is exceedingly low and large areas of apparently useless land are required to conserve them in perpetuity. This area also has particular zoological interest since it contains the most western part of the range of an essentially Eastern Australian animal i.e. Blackistonia, a genus of trapdoor spider.

The southern end of the reserve is largely occupied by the salt lake systems of Lake Tay and Lake Sharpe. Peak Charles (2160 ft.) is the major feature.

In the northwest corner of the proposed reserve is part of the Bremer Range from which the area takes its name. This low range is a north-northwest trending belt of predominantly meta-igneous Precambrian rocks with minor beds of metasediments. It does not have any great topographical prominence and it might well be described as a very slight elevation on the plateau which lies westward of the latitude of Esperance. It is probably not more than 18 feet above the surrounding country but is a noticeable feature in the otherwise monotonous sandplain which overlies granite gneiss in the country surrounding it. The vegetation surrounding the Range is Sclerophyllous Woodland like that of the Southern Goldfields and is much the same in character as that which is found at Norseman.

The thin jaspilite beds which constitute the backbone of the Range have been sampled for iron content and average 40% acid soluble iron. This is of low medium grade and it is doubtful if it can be regarded as an iron ore at all.

Water is extremely scarce in the area and access is by the Hyden-Mount Thirsty Road which passes the northern end of the Range, or by a more southern road from Norseman to Lake King which passes through the centre of the area.

Location: $32^{\circ}3' - 32^{\circ}50'S$
$120^{\circ}38' - 121^{\circ}12' E$

State of Reservation:

Not reserved.

Area: 576,000 acres approx.

Literature: Connolly, R. R. (1959). — Iron ores in Western Australia. Geol. Surv. & W.A. Min. Res. Bull. No. 7.

Honman, C. S. (1914). — The Bremer Range Country, Dundas Goldfield. Rept. No. 46 in Geol. Surv. W.A. Bull. No. 59, p. 190-204.

Opinion: The Sub-committee is of the opinion that:

1. the areas listed above should be gazetted a Class A Reserve to constitute a National Park, and be vested in a Statutory Body having control of other National Parks;

2. an area adjacent to and including Peak Charles should be classified for public recreation — this area, with the access roads to it and to various parts of the Park, should not exceed ten percent of the total area of the National Park;

3. the remaining area should be set aside for the preservation of fauna and flora.

25.— LAKE BARKER RESERVE

The Lake Barker Reserve (No. 24049) covers 516,420 acres southeast of Southern Cross and is set aside for the preservation of fauna and flora. It is not vested.

The area was set aside as a Reserve in 1954 because it is botanically typical of the boundary which exists between the South-west province and the Eremean and is a locality quite rich in very interesting plants some of which are endemic within the area. The area is clothed primarily with Sclerophyllous Woodland growing on soils derived from metamorphosed basic rocks, acid rocks, and some metasediments, all of Precambrian age. The Sub-committee believes that this area will eventually become one of considerable historical interest because it will be a good example of what the vegetation of the Goldfields and the eastern agricultural areas were like before the days of timber-cutting for mines, and clearing for farming, became widespread. It is clear that quite a number of plants occurring in this Reserve are rapidly becoming scarce today because of agricultural development to the west of the Reserve.

It is of historical interest to note that one of the earliest significant gold discoveries in Western Australia was made close to the western boundary of the Reserve at the Parker Range in 1887. This find (associated with others at Golden Valley and the spot which later became known as Southern Cross) led to the proclamation on the Yilgarn Goldfield in 1888.

The area is close to Southern Cross and other towns along the Great Eastern Highway. Camping reserves are fairly numerous along this highway and adjacent roads and the Sub-committee feels that it would be undesirable to open up any part of this Reserve for public recreation and camping.

Location: $31^{\circ}20' - 32^{\circ}3'$ S
$119^{\circ}33' - 120^{\circ}$ E

State of Reservation:

Class C Reserve (No. 24049). Not vested.

Area: 516,240 acres.

Literature: None known.

Opinion: The Sub-committee is of the opinion that:

1. the area of Reserve No. 24049 should be gazetted a Class A Reserve for the preservation of fauna and flora;

2. that it should be scheduled a National Nature-Reserve and be vested in a Statutory Body having control of other National Nature-Reserves and preserved in perpetuity in a state of natural bushland.

26.— NORTHERN NULLARBOR AREA

This large area of country which is recommended for reservation by the Sub-committee includes regions which are representative of all the geological formations of the Northern Nullarbor area, and their associated vegetation which ranges from the typical almost treeless flat lying marine limestone of the Nullarbor to the Precambrian areas further north.

The south-eastern corner of the area selected lies 33 miles to the north of Deakin on the Transcontinental Railway line and stretches for a distance of some 95 miles to the west. The northern boundary is about 30 miles north of Forest Lakes in the east and Lake Ell in the west. About 60 miles north of the south-western corner lie the Shell Lakes which have also been included in the proposed reserve.

A transect from the south west towards the north eastern corner of the reserve broadly illustrates the regions of the area.

(1). The southern edge is typical, almost flat, limestone country of the Nullarbor. Numerous dongas act as drainage channels. The general vegetation is a grassland of Stipa with Sturt Pea and Swainsona. Where thickets occur, the principal

trees are Myoporum, Pittosporum phillyraeoides and Curara (Acacia tetragonophylla).

(2). To the north of the grassland, the limestone country continues, but the vegetation changes to an open woodland of Myall (Acacia sowdenii) with an understorey of Bluebush (Kochia spp.).

(3). Further north the geological nature of the country changes. The dominant rocks are micacous sandstone while the country becomes more undulating with rolling hills and broad valleys in which are poorly defined water-courses. Myall and Bluebush are still dominant on the rises but Curara, Mulga and Myoporum, occur in the valleys.

(4). To the north is a rather narrow belt of sands not blown into dunes, and on which occur the first eucalypts (E. oleosa and E. gracilis). Beyond these sands are Shell Lakes, one of the series of large salt pans which extend across the northern limit of the Nullarbor.

Eastward from the Shell Lakes to north of Forrest Lakes, the country is, geologically, a complex of Permian glacial beds, flat-lying well-bedded sandstones, limestones of the Nullarbor complex, and Precambrian quartzites. The whole of this area is traversed by innumerable east-west sand dunes which are blown over all of these rock types.

The vegetation is rich and extremely varied. On sand hills, spinifex, mallee and acacia are dominant. In the hollows between dunes the vegetation varies with the soil type but eucalypts such as E. oleosa together with Mulga, (Acacia aneura) are common.

Around the salt flats are found Atriplex spp., Rhagodia spp., Kochia spp. and Arthrocnemum.

The floral diversity of the region is shown by the common genera which are represented as follows:

Eucalyptus (9 species): Acacia (8 species): Eremophila (8 species).

Also in the flora are such genera as Stylidium, Daviesia, Dampiera and Templetonia.

Mygalomorph spiders, frogs, reptiles and birds suggest that this region on the northern side of the Nullarbor is, even now, acting as a corridor connecting the faunas of eastern and western Australia. Mammals are not in great variety in the area but the Marsupial mole (Notoryctes) is found in the desert sand dunes and is said by local natives to be abundant at Eltoon.

The Sub-committee believes that it is important that a representative sample of this physiographically complex region should be kept intact. Preliminary examination of this area, with its many floristic and faunistic indications of connections between eastern and western Australia, suggests that intensive study will yield much information of significance for biologists interpreting biogeographic relationships between eastern and western Australia.

Location: 29° - 30°17' S
126°53' - 129° E

State of Reservation:

Not reserved.

Area: 5,552,000 acres approx.

Literature: Gibson, C. G. (1909). — Country lying along the route of the proposed Transcontinental Railway in Western Australia. Geol. Surv. W.A. Bull. No. 37.

Opinion: The Sub-committee is of the opinion that:

1. the area described above should be gazetted a Class A Reserve for the preservation of fauna and flora as a National Nature-Reserve:

2. it should be vested in a Statutory Body having control of other National Nature-Reserves and that it be preserved as natural bushland.

27.— MOUNT MANNING RANGE AREA

Situated east of Mount Jackson this area of approximately 449,900 acres is a typical example of southern Mulga country and its characteristic associations, true Mulga (Acacia aneura) being the principal species. The area has not been included in pastoral leases and is probably in almost virgin condition. The area is relatively unexplored and not very much is known about it.

The southern Mulga area is dominated by the true Mulga (Acacia aneura) and other glaucous phyllodineous species as well as certain species with bright green phyllodes. Eremophila is represented by many species while a few Eucalyptus are to be seen in some areas. The herbaceous cover consists of winter growing species which principally represent the families Compositae, Goodeniaceae, Papilionaceae and Portulacaceae.

The area of the proposed reserve has been geologically mapped as consisting of various Precambrian metamorphic rocks but there is no detailed description available. Meteoric iron has been reported in the area.

The real importance of this area as a biological reserve is twofold. Firstly, the catastrophic effects of grazing in Mulga communities is clearly visible in many parts of Western Australia and it is essential that a permanent yardstick of natural vegetation be established in order to provide a standard of comparison with areas which have been used in the pastoral industry. Secondly, the fauna and flora of the southern Mulga has not been adequately studied and, owing to the effects of grazing, few natural communities remain.

This area is in Crown Land and is not at present reserved.

Location: 29°27' - 30° S
119°30' - 120°8' E

State of Reservation:

Not reserved.

Area: 449,900 acres approx.

Literature: None known.

Opinion: The Sub-committee is of the opinion that:

1. the area east of Mount Jackson should be gazetted a Class A Reserve for the preservation of fauna and flora;

2. it be vested in a Statutory Body having control of other National Nature-Reserves and remain forever in a condition of natural bush as a National Nature-Reserve.

28.— LAKE DISAPPOINTMENT AREA

Large areas of central Western Australia are sandy desert country, inhospitable in the extreme, but biologically of great interest and importance, and are of great scenic grandeur. The area selected by the Sub-committee as an example of this type of desert environment includes both Lake Disappointment and the country to the west of it as far as the No. 1 rabbit proof fence; most of it lies within the south-western part of the Talgarno Prohibited Area for the testing of long range weapons. (See Commonwealth of Australia Gazette, No. 74 of 4 December 1958, p. 4106).

The general area has been geologically mapped as comprising undifferentiated Kainozoic sands which probably overlie Proterozoic sediments and Permian glacials. The lake itself, is a large inland salt pan and H. W. B. Talbot (1920 - see Literature) regards the lake as being part of a dismembered river system. Fluviatile material in excess of 60 feet in depth has been located in borings in the Lake Disappointment area.

The proposed reserve includes a section of the historic Canning Stock Route and is typical of the country through which such explorers as Gregory and Warburton passed in their remarkable expeditions of 1856 and 1872. Little detail is known of the actual area chosen, but survey parties and geologists have entered it and it can be taken as being typical of much of the central Australian desert country comprising mainly gibber plain and sand dunes.

The area has always had importance to native people because of its strings of water holes, and rock paintings are known to occur in it. Paintings are reported by Lindgren at Ngiyanunya and Ngutjapungkanu rock holes (see Literature below).

The proposed reserve is a very big one of approximately 1,230 square miles of the most pastorally and agriculturally unpromising land and it may be wondered why the Sub-committee has selected so much of it. However, desert faunas and floras are known to require enormous areas to preserve them entire. Moreover the size of this reserve alone and its desolation are certain to possess considerable attraction for adventurous Australians in years to come. For this reason we believe that it should be set aside as a National Park.

The area between the rabbit proof fence and the highway is at present not in any lease. A road reserve might well be set aside in it in order to provide wide access to the area.

Location: 23° - 24° S
120°18' - 123°36' E

State of Reservation:

Not reserved.

Area: 1,230 square miles approx.

Literature:

Lindgren, E. (1960). — Natural history notes from Jigalong, North-western Australia. W. Aust. Nat. 7 : 122-128.

Lindgren, E. (1961). — Natural history notes from Jigalong, North-western Australia. W. Aust. Nat. 7 : 169-176 (Map with localities, p. 173).

Talbot, H. W. B. and R. A. Farquharson (1920). — The geology and mineral resources of the North-west, Central and Eastern Divisions between Long. 119° - 122° E and Lat. 22° - 28° S. Geol. Surv. W.A. Bull. No. 83.

Opinion: The Sub-committee is of the opinion that:

1. the area described above should be gazetted a Class A Reserve;

2. following biological survey, camping sites should be selected and separately gazetted Class A Reserves for public recreation and camping. The whole of the remainder should be gazetted for the purpose of the preservation of fauna and flora and left in natural bush condition;

3. the whole area should comprise the Lake Disappointment National Park and should be vested in a Statutory Body having control of other National Parks.

29.— QUEEN VICTORIA SPRING AREA

Queen Victoria Spring was discovered in 1875 by the explorer Ernest Giles who named it after Her Majesty Queen Victoria. The Spring is a soak situated in the centre of 20 to 30 acres of grassland which are surrounded by small bushes, Eucalypts, Acacias and Triodia. The soak itself is in sand on a clay bottom and has apparently formed in an old clay pan which has been filled with drifting sand. The highest feature in the area which is proposed as a reserve is Streich Mound, a high sandhill about nine miles east-southeast from the Spring.

The area of the proposed reserve has numerous sand dunes in it. These dunes overlie gneiss, and are representative of the environment typical of the boundary of the sandy desert of the interior and the metamorphosed Precambrian of the Goldfields. The flora is interesting in that it is a desert association which includes winter rainfall Mulga. The predominant vegetation in the area is Triodia steppe and the several species of Triodia form the dominant vegetation over the greater part of the area. In certain sections these grasses are replaced by Eriachne, Eragrostis, and Aristida. Goodeniaceae is well represented among the shrubs, while species of the family Malvaceae, Leguminoseae, Proteaceae, Compositae, Chenopodiaceae are common. The tree storey consists chiefly of Eucalyptus, the principal species being E. gongylocarpa, E. oleosa var. glauca, E. flocktoniae, and the mallees E. cylindrocarpa, E. concinna and E. leptophylla. Acacia is well represented, as are Callitris and Eremophila. Two interesting features are the numerous isolated patches of Mulga, and the very large specimens of the grasstree or Blackboy Xanthorrhoea thorntoni which are common in the area.

No comprehensive studies have been made of the fauna of the area but records occur in the literature. For example, this is the furthest eastern locality of the frog Neobatrachus sutor; the rare desert Gecko, Lucasius damaeus, also occurs in the area together with a new species, Diplodactylus maini, which was undescribed until 1962.

Location: 30°16' - 30°52' S
123°14' - 123°55' E

State of Reservation:

Temporary Reserve for natives.

Area: 618,750 acres approx.

Literature:

Gibson, C. G. (1909). — Country lying along the route of the proposed Transcontinental Railway in Western Australia. Geol. Surv. W.A. Bull. No. 37.

Kluge, A. G. (1962). — A new species of gekkonid lizard of the Genus Diplodactylus from the Southern interior of Western Australia. W. Aust. Nat. 8 : 97-101.

Serventy, V. N. (1956). — Birds of Queen Victoria Spring. W. Aust. Nat. 5 : 102-107.

Slater, P. and E. Lindgren (1955). — A visit to Queen Victoria Spring, January 1955. W. Aust. Nat. 5 : 10-18.

Opinion: The Sub-committee is of the opinion that:

1. the Queen Victoria Spring Area should become a National Nature-Reserve;

2. it should be re-classified as a Class A Reserve for the preservation of fauna and flora;

3. the whole area should be vested in a Statutory Body having control of other National Nature-Reserves and remain forever in a state of natural bush.

50.— BARLEE RANGE AREA

This area of 265,500 acres has been selected by the Sub-committee because it represents a natural area of vegetation in the rugged much-dissected Proterozoic sediments of the southern part of the north-west of Western Australia. It is an area of spectacular scenery with deep steep-sided gorges and deep permanent pools. Primarily, it consists of an up-arched sequence of folded Precambrian sediments dissected by streams such as Kookhabinna Creek.

The fauna is interesting. In the larger mammals it it typical of that part of Western Australia e.g. Rock Wallabies and Euros are present. The fauna of smaller animals suggests that it may contain relict nuclei of southern and northern elements. This is suggested by the snails and, in particular, by a bivalve. In addition, there are six or seven species of freshwater fish and a freshwater bryozoan in the streams.

The vegetation of the rugged hilltops is dominated by Triodia steppe. Very few smaller shrubs occur, but these are mainly of the families Amarantaceae, Goodeniaceae, Umbelliferae, Chenopodiaceae, etc. Trees and taller shrubs are principally Eucalyptus, Eremophila and Cassia.

In the valleys Eucalyptus is abundant with Melaleuca, Acacia and Eremophila. Smaller shrubs are more common consisting of species of Leguminosae, Compositae, Solanaceae and Malvaceae as well as many from the hills. There are only small patches of Triodia in these valleys but large beds of Cyperaceae are seen along the banks of the streams.

Access into the area is extremely difficult. There are no roads, no tracks and all entry must be made on foot.

This area was recently the subject of a survey by the Fauna Protection Advisory Committee whose members were initially responsible for drawing the attention of the Sub-committee to the area.

Location: 22°55' - 23°25' S
115°46' - 166°7' E

State of Reservation:

Part not reserved, part held in lease.

Area: 265,500 acres approx.

Literature: Robinson, A. (1933). — Notes on Wood-Swallows and Swallows of the Barlee Range, W.A. Emu 33 : 95-96.

_____ (1934). — Additional notes on Wood-Swallows and Swallows of the Barlee Range, W.A. Emu 34 : 75.

_____ (1939). — Birds of the Barlee Range. Emu 38 : 461-466.

Opinion: The Sub-committee is of the opinion that:

1. the area mentioned above should be gazetted a Class A Reserve for the preservation of flora and fauna;

2. an expert committee comprising those members of the Fauna Protection Advisory Committee who recently surveyed the area should be set up to make recommendations as to whether the purpose of reservation of the whole area be the preservation of fauna and flora and be classified as a National Nature-Reserve or whether certain areas within the whole and not exceeding one tenth of it (including footpaths) could be reserved for public recreation. If the latter conclusion is reached by the expert committee and the area classified a National Park, the Sub-committee further recommends that no roads for vehicular traffic be constructed within it.

31.— HAMERSLEY RANGE AREA

Mount Bruce (4024 feet) is the highest point of land in Western Australia and the surrounding country includes some of the most magnificent and spectacular scenery in the State. This large area in the vicinity of Mount Bruce has not only been selected by the Sub-committee as a National Park because of this, but also because it contains representatives of the characteristic flora associated with summer rainfall Mulga. In this area the Mulga, Acacia aneura, is the dominant tree and with it are associated several closely related phyllodineous species, all remarkably similar in appearance, while the genus Eremophila is represented by many species. The native Kurrajong Brachychiton gregorii is an interesting and fairly common tree. Other shrubs which occur are mostly from the families Malvaceae, Amarantaceae and Caesalpineaceae. Herbs are principally the summer growing grasses both annual and perennial and the many species of Trichinium (Mulla-mulla).

The fauna is varied and interesting and contains many species of mammals, e.g. dingoes, Red Kangaroos and Euros, the Little Northern Native Cat, several species of bats (the Ghost Bat, two species of Taphozous, Gould's Wattled Bat, and the Little Bat) and the Echidna or Native Porcupine. Reptiles are common and varied and the avifauna is also of great interest.

The suggested reserve is very large, extending from just south of Wittenoom townsite, southwards right through the Hamersley Range, to the east branch of Turee Creek. It includes a number of magnificent mountain peaks and a complete section through the range from north to south. It also includes such gorges, well known to the modern tourist, as Wittenoom Gorge and Yampire Gorge; the Dale Gorge Reserve (Class C) is also within the border of the proposed reserve. None of the proposed area is taken up for pastoral purposes and it is not considered to be good pastoral country.

Dale's Gorge—Wittenoon

There is no doubt that, with the growth of the tourist industry in Western Australia, this area will become one of the most popular National Parks in the State.

Location: 22°36' - 23°15' S
117°50' - 118°27' E

State of Reservation:

Not reserved, plus Reserve No. 24438 for the preservation of flora and fauna.

Area: 1,437,300 acres approx.

Literature:

Mees, G. F. (1961). — An annotated catalogue of a collection of bird-skins from West Pilbara, Western Australia. J. roy. Soc. W. Aust. 44 : 97-143.

Whitlock, F. L. (1923). — A trip to the Fortescue River and Hamersley Ranges, North-West Australia. Emu 22 : 259-273.

Opinion: The Sub-committee is of the opinion that:

1. the area shown described above should be gazetted a Class A Reserve;

2. that an expert committee should be set up to make recommendations regarding the subdivision of the area into areas to be set aside for the preservation of fauna and flora (and kept as natural bush), and areas to be opened up for tourist access as areas for public recreation, the latter areas should not exceed one tenth of the whole;

3. the whole area should be a National Park and vested in a Statutory Body having control of other National Parks.

32.— DAMPIER ARCHIPELAGO AREA

The Dampier Archipelago lies close to the Western Australian coast to the west of Roebourne. It was discovered by William Dampier in 1699 and subsequently named after him by Baudin of the French expedition which visited the area in 1802. The Archipelago consists of a number of waterless islands which total slightly less than 50 square miles in area. Their names are Dolphin, Enderby, West Lewis, East Lewis, Legendre, Rosemary, Gidley, Angel, Malus, East Intercourse, Hauy and Delambre. Rosemary Island was named by Dampier and the remainder by subsequent visitors.

The Islands are of biological and scientific interest because they are virtually pieces of the mainland which have been cut off by the sea. As such, they support a flora and fauna which is essentially the same as that of the mainland. Thus, providing the flora and fauna are protected, the Islands will constitute an invaluable yardstick by which to measure the effect of the pastoral industry on adjacent areas of the mainland.

The Islands have been visited by a small party sent by the Western Australian Museum comprising Mr. B. R. Wilson and Mr. D. G. Bathgate. Wilson's report forms the basis for the following notes.

The Islands are of two main geological types. The most northern islands of the Group, Legendre, Hauy and Delambre, are composed of limestone and are low and covered with sand dunes. They appear to represent the dunes of an old coastline which was formed when the rest of the Archipelago was actually connected with the mainland. Subsequently, this dune system has become drowned and the highest points have become limestone islands. The other islands are geologically similar to the hills of the mainland and have clearly been cut off by an eustatic rise in sea level. Exposures of dark fine-grained basic metamorphic rock which fractures into angular boulders forms steep screes on their sides. These screes cover much of the islands. Small areas of the foreshore of these rocky islands are fringed by low sand dunes. Dolphin Island is quite high (the highest of the Islands in the Archipelago) and rises to 450 feet.

Dolphin Island appears to have the richest flora. Kurrajong trees are common on the rocky hills and many of the valleys have dense thickets of Acacia and Eucalyptus. The ground-cover in the valleys and on the hillslopes between the screes of the rocky islands largely consists of Triodia. On Rosemary Island the grasses Setaria dielsii and Sorghum plumosum are found in the low valleys and two species of Acacia are the dominant shrubs on the fringing sand dunes. Acacia is also the most common shrub on the sand dunes of Delambre.

The fauna of the Islands is of the greatest interest and clearly demands that the Archipelago be reserved. Rothschild's Rock Wallaby (Petrogale rothschildi) occurs in large numbers on Rosemary and also on Enderby. This Rock Wallaby is thinly distributed on various parts of the Pilbara but is not yet securely protected in an island sanctuary. It occurs nowhere but in Western Australia. A form of the Euro or Hill Kangaroo (Macropus robustus rubens) also occurs on Dolphin Island. This form also occurs nowhere but in Western Australia and is at present protected in no island sanctuary.

Fishermen, who visit the Islands, also claim that another small animal which they call the "Wodgie-wulla" occurs on one of the islands, but it is not known what this is.

The marine fauna of the Archipelago is exceptionally rich. Coral reefs are extensive and well populated with marine life. The most notable coral reef surrounds Delambre Island and connects Delambre to Hauy. There are also many extensive tidal sandflats which support a large and interesting fauna.

Rosemary, Enderby, Angel, and Dolphin Islands are noteworthy also because they contain large numbers of rock carvings which are rumoured to be similar to those on Depuch Island further east. On Rosemary Island, on the sand dunes at the foot of the rocky hill on which the carvings are situated, there is an extensive workshop site containing numerous artefacts.

There is no permanent water on any of the Islands of the Archipelago and they are entirely uninhabited. Their only visitors are fishermen from Point Samson near Roebourne who fish for Spanish Mackeral in the area. During the early summer the fishermen make base camps on the Islands and pick rock-oysters along their shores. Not more than a dozen men are involved in this industry at the present date.

While the Islands have much to offer the tourist in terms of fishing, beaches, scenery, and coral reefs, their inaccessibility, numerous sandflies, sharks in large numbers, and the lack of fresh water on them makes it seem unlikely that any development of the Islands themselves as tourist resorts would be successful. The unique faunas of some of them also make it undesirable and, if some are to be used as comparative yardsticks to provide a measure of man's interference on the adjacent mainland, it is important that these islands should not be interfered with. The most valuable tourist asset in the area is definitely its fishing, but the exploitation of this is almost certain to be better based upon Point Samson where water, transport and facilities are available, rather than on the inhospitable Islands. Accordingly, the Sub-committee feels that these Islands should be proclaimed a National Park and that no interference with the natural bush and rock carvings on certain of the Islands be permitted.

Location: $20^{\circ}27' - 20^{\circ}9'$ S
$116^{\circ}13' - 117^{\circ}$ E

State of Reservation:

Unreserved (1961).

Area: Not known.

Literature: Dampier, W. (1729). — A Voyage to New Holland, &c. in the Year 1699. 3rd Ed. 3, chap. 3.

Whitlock, F. L. (1919). — Notes on birds breeding in Dampier Archipelago, N. W. Coast of Australia. Emu 18 : 240-253.

Woodward, H. P. (1890). — Annual Report of the Government Geologist of W. Aust. for the year 1890. Votes & Proceedings of W.A. Parl. 1891-2. Report No. 5.

Opinion: The Sub-committee is of the opinion that:

1. the Islands of the Dampier Archipelago as listed above should be gazetted Class A Reserves and together comprise a National Park vested in a Statutory Body having control of other National Parks;

2. a biological survey should be made of the Archipelago and, following such survey, recommendations should be made as to which islands should be set aside for public recreation;

3. the remaining islands in the National Park be set aside for the preservation of fauna and flora.

33.— BARROW ISLAND RESERVE

Barrow Island is one of the oldest and most important reserves off the coast of Western Australia. It was set aside as a Class A Reserve for the protection of fauna and flora in 1908. Its approximate area is 50,000 acres.

Few biologists have worked on Barrow Island. J. T. Tunney of the Western Australian Museum visited the island in the early part of this century and collected the first material from it since the visit of Captain Stokes in H.M.S. BEAGLE in 1840. Subsequently, and very recently, Dr. D. L. Serventy of Wildlife Section, C.S.I.R.O. visited the island and the description which follows here is furnished by him for the report.

"Barrow Island is the largest and most outlying island of the Dampier Archipelago and situated 65 miles north of Onslow in Lat. 21° S., Long. 115°20' E. It is approximately 18 miles long with an average width of 5 to 8 miles. A low red sandy island, the highest hill being only 270 ft. above sea-level, it presents a desolate and uninviting appearance when viewed from seaward. Around the coastal margin there are outcrops of Miocene Limestone and sandy limestones of Quaternary age, forming low cliffs and detached islets near the shore.

Further inland are outcrops of Eocene calcarenite. The only considerable thickset vegetation consists of mangroves along sheltered beaches and the margins of tidal creeks, with clumps of the Necklace Acacia (Acacia coriacea) on some of the low dunes. Extensive areas are covered with spinifex (Triodia). A variety of other plants also occurs.

The fauna is of great biological interest and because of it the island was declared a Class A Reserve.

It is the most mammal-rich island off the Western Australian coast — south of the Kimberleys. No less than six species of native mammals have been collected there, namely the Barrow Island Biggada (Macropus robustus isabellinus), the Spectacled Hare-Wallaby (Lagorchestes conspicillatus), Rock Wallaby (Petrogale lateralis), Barrow Island Bandicoot (Isoodon obesulus barrowensis), Crest-tailed Marsupial-Mouse (Dasycercus cristicauda) and the Barrow Island Mouse (Thetomys ferculinus). Most of these forms are well differentiated from mainland relatives and most are still plentiful. No

exotic rodents or carnivores have become established so far.

Of the 18 species of land-birds which have been recorded, two are of outstanding interest. The Black-and-White Wren (Malurus leucopterus), a distinctive insular form of the White-winged Wren (M. leuconotus), is known elsewhere only from Dirk Hartog I., and is very abundant. The Spinifex-bird or Carter's Desert Bird (Eremiornis carteri) is more plentiful on Barrow I. than anywhere on the mainland. There is a colony of Wedge-tailed Shearwaters (Puffinus pacificus) on an islet, Double I., off the north-east shore."

Barrow Island is not at present vested and is under the control of the Minister for Lands.

Location: 20°22' - 20°40' S
116°14' - 116°59' E

State of Reservation:

Class A Reserve (No. 11648) for the preservation of flora and fauna. Not vested.

Area: 50,000 acres.

Literature:

Simpson, E. S. (1902). — Notes from the Departmental Laboratory. Geol. Surv. W.A. Bull. No. 6.

Serventy, D. L. and A. J. Marshall (1964). — A natural history reconnaissance of Barrow and Montebello Islands 1958. C.S.I.R.O. Wildlife Res. Tech. Pap. No. 6 : 3-23. (See very full references given in this paper.)

Woodward, H. P. (1890). — Annual Report of the Government Geologist of W.A. for the year 1890. Votes & Proceedings of W.A. Parl. 1891-2, Report No. 5.

Opinion: The Sub-committee is of the opinion that:

1. Barrow Island should remain a Class A Reserve for the protection of fauna and flora;

2. it should be scheduled a National Nature-Reserve vested in the same Statutory Body having control of other National Nature-Reserves and that it should be maintained as natural bush without special facilities for the residence of tourists;

3. that no wharf or jetty should be built from the Island to permit craft to moor alongside. This recommendation is made to reduce the chance of rodents being introduced which might threaten the native Thetomys ferculinus.

34.— BERNIER and DORRE ISLANDS RESERVES

Bernier and Dorre are two islands which mark the western limits of Shark Bay in the vicinity of Carnarvon. Both islands are Class A Reserves for the preservation of fauna and flora and vested in the Fauna Protection Advisory Committee of Western Australia. They are of great biological interest, not only because they provide an interesting comparison with the adjacent mainland, but also because they contain populations of wallabies and plants which appear to have complex ecological relations. In addition they are important field laboratories because they can be compared with each other and Dirk Hartog Island which has long had, in addition to natural vegetation and natural herbivores (i.e. the wallabies), a population of sheep.

The Islands are largely composed of Quaternary aeolianite with some loose sand and they are situated in an area which contains elements of both the flora of the

south-western floristic province and the Eremean (or Central Australian) province. There are, in addition, occasional representatives of the Northern Province on the Islands as well. The Islands are the type locality for at least two species of plants, Triodia plurinervata and Beyeria cyanescens, and probably also for several other species of which the locality is mentioned in the literature as Shark Bay.

The fauna of wallabies and other native mammals is biologically important. One species, the Banded Hare-wallaby, Lagostrophus fasciatus, is possibly extinct on the mainland today and its only sanctuary is in these Islands. The species occurs nowhere else in the world. The Boodie, Bettongia lesueuri, is possibly also in a similar situation. Neither species has been collected on the mainland of Western Australia for more than 20 years. In addition, to these two, there is the Western Hare-wallaby, Lagorchestes hirsutus, which is sparsely distributed in Central Australia, and parts of Western Australia, but it appears to be secure on these Islands. In addition to these, there are two native mice, Gyomys albocinereus and Thetomys praeconis. This latter species occurs nowhere but on Bernier Island and the Peron Peninsula. There is also a Bandicoot, Perameles bougainvillei, which is also rare on the mainland.

Australian biologists are keenly interested in Bernier and Dorre because these Islands have accounts of their biology written at intervals since 1699. Dampier visited them, the French Baudin expedition of 1802 described the fauna, and they were subsequently visited by Tunney of the Western Australian Museum. Most recently they were visited by an expedition from the Fauna Protection Advisory Committee which has just completed the publication of a monograph on the Islands.

It is clear that these Islands must not be interfered with and that they are biologically of great value, both as a yardstick and as natural laboratories which will help us to understand the processes of ecological interaction within our native communities. They must be retained as natural bush and are of sufficient importance to be created National Nature-Reserves.

Location: 24°41' - 25°13' S
113°6' E

State of Reservation:

Class A Reserve (No. 24869) for the preservation of flora and fauna. Vested in the Fauna Protection Advisory Committee of Western Australia.

Area: 26,000 acres approx.

Literature: Ride, W. D. L., Royce, R. D., Tyndale-Biscoe, C. H., Mees, G. F. and A. M. Douglas (1962). — The results of an expedition to Bernier and Doore Islands, Shark Bay, Western Australia, in July 1959. Fauna Bull. W. Aust. No. 2 — see this for a very complete bibliography.

Opinion: The Sub-committee is of the opinion that:

1. Bernier and Dorre Islands should remain Class A Reserves set aside for the preservation of fauna and flora;

2. they should remain vested in the Fauna Protection Advisory Committee or some other Statutory Body which controls National Nature-Reserves;

3. they should be classified National Nature-Reserves and remain in perpetuity as natural bushland.

35.— POINT COULOMB (DAMPIER LAND) AREA

The area of 313,600 acres to the east and south of Coulomb Point in Dampier Land between Broome and Beagle Bay has been selected by the Sub-committee in order to preserve a characteristic botanical association of the Northern Province of Western Australia. This association, the Pindan, occurs in the south of the Northern Province and consists of tall grasses under a fairly compact cover of Acacia. This part of Dampier Land is typical of the littoral savannah land of Kimberley and has sandy soil, lightly timbered with bloodwood trees of several species, tall grass, with a fairly rich herbaceous growth in it.

The area is mapped as comprising Kainozoic sediments overlying Cretaceous and Jurassic sediments.

Little is yet known of the fauna of this area but what information there is indicates that it will be of considerable importance as a reserve and as a yard-stick where savannah communities can be studied. Among mammals in this area are to be found the Nail-tailed Wallaby or Karrabul (Onychogale unguifer), the Jungle or Sandy Wallaby (Protemnodon agilis) and the Rabbit-eared Bandicoot or Dalgyte (Macrotis lagotis). To the north of the proposed area there are two leases, 396/802 and 396/761. These leases separate the area from the extensive Beagle Bay native Reserve but it is believed that applications will not be made for the renewal of these leases due to the poor quality of the land in them. Should they become vacant, these leases should be incorporated into the reserve.

The Sub-committee is not sufficiently informed to decide whether it should be entirely a National Nature-Reserve or whether it might not comprise a National Park in the Broome area.

Location: $17^{\circ}13' - 17^{\circ}37'$ S
$122^{\circ}5' - 122^{\circ}27'$ E

State of Reservation:

Not reserved.

Area: 313,600 acres approx.

Literature:

Brunnsweiler, R. O. (1951). — Notes on the geology of Dampier Land, Northwestern Australia. Aust. J. Sci. 14 : 6-8.

Dampier, W. (1729). — A New Voyage Around the World. I : 462-470. 7th Ed., Knapton, London.

Vevers, J. J. and A. T. Wells (1961). — The geology of the Canning Basin, Western Australia. Bull. Bur. Min. Resour. Aust. No. 60.

Opinion:

The Sub-committee is of the opinion that:

1. the area in the vicinity of Point Coulomb should be set aside as a Class A Reserve;

2. the area should be vested in a Statutory Body responsible for other National Nature-Reserves;

3. should leases 396/802 and 396/761 become vacant, they should be added to the National Nature-Reserve as Class A Reserves;

4. a biological survey should be carried out of the area and, subsequent to the survey, an expert committee should be appointed to make recommendations as to whether the area should become a National Park and, if so, to recommend on the selection and classification of certain areas for the preservation of fauna and flora, and others for public recreation, the latter to comprise not more than one tenth of the whole area. If the expert committee decides that the whole area should be left as natural bushland, the purpose of reservation should be gazetted as for the preservation of fauna and flora.

Typical sandstone gorge, branch of Prince Regent River near Mt. Hann (Photo F. M. House)

36.— PRINCE REGENT RIVER AREA

The enormous precipitous gorge of the Prince Regent River is the most attractive watercourse in Western Australia. The river rises between Mount Hann and Mount Agnes at a height of over two thousand feet and descends in some 25 to 30 miles to sea level through a gorge whose physical features are unsurpassed on the Australian continent.

Part of this area has the highest rainfall in tropical Western Australia with a rainfall which is in excess of 50 inches per annum. Unfortunately, there are no meteorological stations within two or three hundred miles to give precise information. However, the vegetation is of such richness that this figure may be overconservative.

The vegetation of the area is rich in Indo-Melanesian elements and ranks with Arnhem Land in this respect. Numbers of species belonging to this distinctive floral unit in the Prince Regent area are not found in other parts of Western Australia.

Most of the country is between 1 and 1,000 feet above sea level, and parts are over 1,500 feet in the north-east. Much of the terrain is composed of King Leopold Beds, which are strongly bedded and folded sandstones and quartzites with basal beds of conglomerate. In places basalts and dolerites occur as fills of deep, steep-sided valleys eroded in the King Leopold Beds or as hypabyssal intrusions in that formation. Around the St. George Basin at the entrance to the Prince Regent River occur Mornington Volcanics which are a grey-green, fine-grained andesite and medium-grained dolerite and basalt occurring as valley-fill, and Warton Beds, which are well bedded medium-grained fine to conglomeratic quartzite, red micaceous sandstone with a shale member several feet thick towards the centre of the sequence. In addition, along the eastern side of the St. George Basin there are areas of coastal and estuarine alluvium which is thought to be Quaternary. Most of the area (that of the King Leopold Beds) is very rugged sandstone country with some skeletal sand soils and bare rock outcrop.

The fauna is typical of that of the high rainfall areas of the Kimberley and, although it is poorly known, except on its outskirts, such important species as the various Rock Wallabies, Sugar gliders, and large numbers of species of native rats occur in the area. The Scaly-tailed Possum, Wyulda, which is entirely confined to this small part of Australia, is known to occur on the southern side of the estuary and it is probable that it also occurs in the area of the proposed reserve.

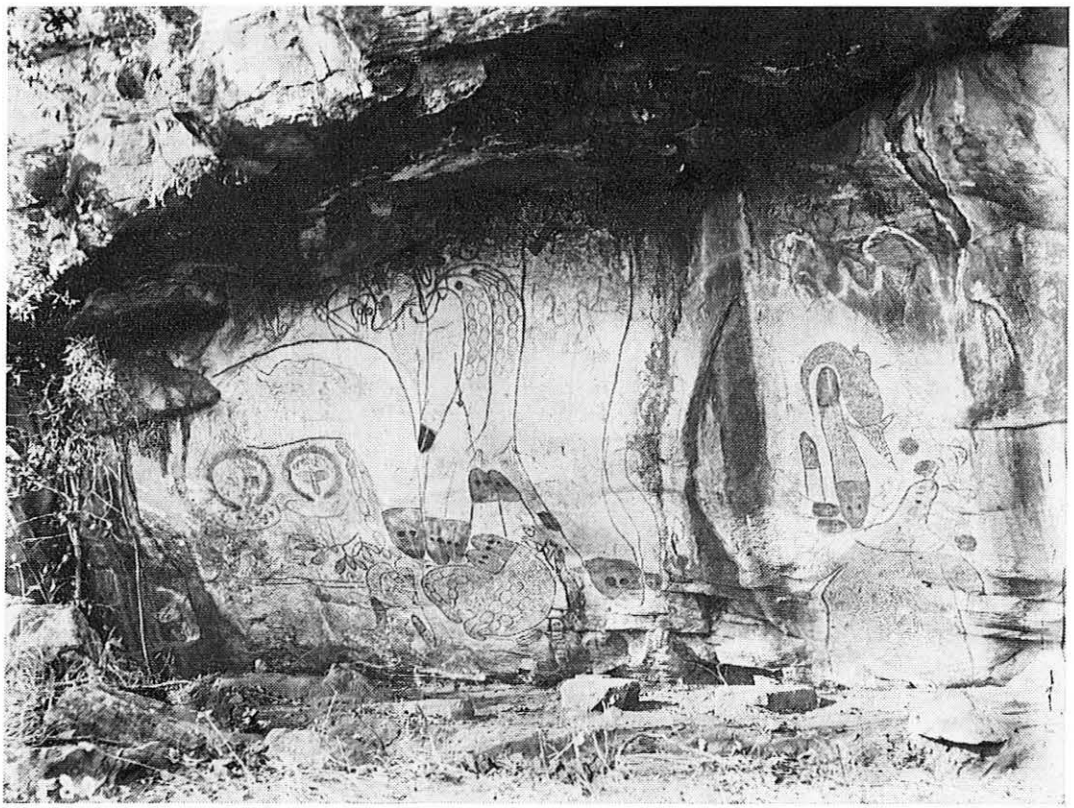
Much of the country is rated by the Division of Land Research and Regional Survey, C.S.I.R.O. as very poor pasture. The forests and woodlands consist of Eucalyptus tetrodonta, Messmate E. phoenicea - E. dichromophloia alliance with poor Plectrachne pungens (soft spinifex) and annual sorghum pastures. Although well watered, the country is generally inaccessible and is considered by C.S.I.R.O. to be unsuitable for the cattle industry.

In addition to this poor country, there are a few minor areas with predominantly skeletal red earth soils with patches of igneous red earths and grey soils of heavy texture. In these there are woodlands of E. tectifica (Grey Box) - E. grandifolia alliance with moderate plume sorghum and annual sorghum pastures with patches of white grass (Sehima nervosum) and Beard Grass (Chrysopogon spp.).

The areas of the Quaternary alluvium along the east of the St. George Basin comprise saline mudflats liable to inundation with fringing communities of mangroves around the estuaries. These lands also are considered by the C.S.I.R.O. to be unsuitable for development for the cattle industry.

Of the great proportion of the land in this reserve the authors of the C.S.I.R.O. Report state "it is therefore recommended that it should be excluded from consideration in any estimates concerned with the development of the north Kimberley area" (Stuart and Speck, 1960, p. 91).

Its outstanding value as a biological reserve and a National Park of great scenic beauty is greatly increased by the enormous numbers of rock carvings and cave paintings which are known to occur in the area.



Aboriginal Drawings near Mt. Hann (*Photo F. M. House*)

These have been described in numerous publications (see Literature below) and, without doubt, the Prince Regent River could become one of the world's outstanding and scenic natural history reserves.

Location: 15° - 16° S
124°50' - 125°45' E

State of Reservation:

Not reserved.

Area: 1,600,000 acres approx.

Literature:

Elkin, A. P. (1930). — Rock paintings of north-west Australia. Oceania I, 257-279.

Gardner, C. A. (1923). — Botanical notes, Kimberley Division of W.A. Bull. Forest Dept. W. Aust. No. 32.

Grey, G. (1841). — Journals of two expeditions of discovery ... I, chaps. 7-10.

Hill, G. F. (1911). — Field Notes on the Birds of Kimberley, North-West Australia. Emu 10 : 258-290.

Stewart, G. A. and N. H. Speck (1960). — Present and Potential Land use of the North Kimberley area, W.A. in Lands and Pastoral Resources of the North Kimberley Area. C.S.I.R.O. Land Res. Ser. No. 4. Part IX. 86-98.

Opinion: The Sub-committee is of the opinion that:

1. the area of Prince Regent River from Mount Hann to the sea and including the islands at its mouth should be set aside as a Class A Reserve;

2. it should be vested in a Statutory Body responsible for the control of other National Parks;

3. a biological and anthropological survey of the area should be carried out in order to determine how it can best be developed to meet the requirements both of tourism and of reservation as natural bush.

4. following the report of such survey, an expert committee should select areas to be set aside for public recreation, the remainder to be gazetted for the purpose of the preservation of fauna and flora. The recreational areas not to exceed one tenth of the whole including the area of water surface in the whole area.

5. The Sub-committee emphasises that this area is a priceless National asset and should not be squandered on risky and damaging attempts at the establishment of the pastoral industry in the face of the strongest advice to the contrary which is contained in the C.S.I.R.O. Report;

37.— DRYSDALE RIVER AREA

This area has been selected by the Sub-committee as containing land typical of the northern savannah formations of tropical Western Australia. However, it is more than that; it contains an exceptionally varied topography and with the exception of the coastal environments provided for in the Prince Regent Area, it contains representative examples of all Land Systems (in the

classification of C.S.I.R.O. Division of Land Research and Regional Survey, Speck et al. 1960) which occur in the North Kimberley.

Within the Kimberley Division, two types of savannah country occur, the sandstone savannah (E. tetradonta (Messmate) - E. phoenica - E. dichromophloia alliance) and the basalt savannah (E. tectifica (Grey Box) - E. grandifolia alliance). Both of these are represented in the area and, since the country has not yet been exposed to pastoral development, the selected area contains a valuable example of the unaltered savannah and will be of great importance as a biological yardstick against which to measure the changes which follow the introduction of cattle into surrounding areas.

Much of the area selected, i.e. that to the east of the Drysdale River, is inaccessible, very rugged "sandstone country" comprising interbedded siltstones, quartzites and shales with well bedded massive sandstones of the Mount House Beds. Soils are mostly skeletel sands and there is much bare rock. There are savannah woodlands of E. tetradonta - E. phoenica - E. dichromophloia alliance with poor Plectrachne pungens (soft spinifex) and annual sorghum pastures. The C.S.I.R.O. Report considers that this type of country is unsuitable for the cattle industry. The country in the vicinity of the Drysdale River, which flows through or is adjacent to the reserve, is somewhat variable. Much of it consists of upper Proterozoic Warton Beds with well bedded medium grained to fine conglomeratic quartzite, red micaceous sandstone and shale. In places it is extremely rough, with the river winding its way through gorges up to three hundred feet deep but in the south western locality it becomes more open where, in the vicinity of Crossland Creek, the sandstone savannah gives way to the basaltic associations. In various places throughout the proposed reserve there are also open seepage flats with a characteristic vegetation.

The part of the proposed reserve which projects westward of the Carson River, contrasts markedly with the rest. In the Eastern and Southern portions of this area the basalt savannah of the E. tectifica - E. grandifolia alliance occurs on the soils derived from the Proterozoic Mornington Volcanics of fine-grained andesite and medium-grained dolerite and basalt which form ranges of hills.

These may be particularly broken but in places the country is undulating with loamey flats and basalt strewn hillsides. In some places there are areas of red soil or isolated black-soil pockets. In the Northern portion the volcanics give way to dissected sandstone formations which contain one of the most spectacular natural features of the area. This is Morgan Falls named after John F. Morgan the leader of the North Kimberley Survey and Mapping Expedition 1954 and who discovered the feature. Mr. Morgan's report of this area is of great interest and gives a graphic picture of the country. Of the fall he says:

> "Some 10 chains above the waterfall is a permanent pool, about 70 yards wide, fringed by Pandanus Palms, and from this point forward, the bed of the creek is sheet sandstone with water-worn holes up to 10 and 20 feet in depth. During the wet season the water rushes over a series of perpendicular drops, each several feet high, the bed being littered with huge sandstone slabs. On the sides of increasing vertical walls are water-worn caverns where old, but barely discernible, native paintings were seen. Next a sheer drop of about 80 feet occurs, at the base of which is a permanent pool with abrupt sandstone walls overlooking it. The stream now turns a complete right angle to the South and falls about 200 feet to another pool on the valley floor, then flows East, and after a distance of 10 chains, turns and flows Northerly through a tight, perpendicular-walled sandstone gorge which commences about three-quarters of a mile South of the fall. This gorge presented a picture of sheer multi-coloured walls from which, with the assistance of binoculars, water could be seen percolating. At the foot of this formation the creek winds its way in a blue ribbon of water, surmounted by tall white gums and stately Cajuputs ...
>
> After passing the Southern end of the gorge, our forward course lay in a South-Easterly direction through sandy country, which, after about three and a half miles, included broken sandstone. In this locality Native paintings were found on the face of a number of overhanging rocks, and the large number of old camp fires under these shelters

indicated its popularity. A bundle of spears, from which the heads had been broken, were found on a ledge under a mushroom-shaped rock. I learnt subsequently from another Black that a buck and his gin had been in this area when we rode through, but on seeing us had become terrified and fled into the bush, leaving their possessions behind.

We continued South-Easterly through stone which was increasing in density, and, in common with similar localities, was distorted into a number of weird shapes. After passing through a narrow, rough gorge, we emerged on the brink of a sandstone formation, and looked down on a dark-ribbon of green, representing the Carson River, several hundred feet below us."

Very little is known of the fauna and flora of this area. Collections of mammals, reptiles and birds have been made at Kalumburu Mission to the north of it and these show that the area can be confidently expected to be rich in such little known and interesting forms of the tropical north as the Rock Wallabies (Petrogale brachyotis and Peradorcas concinna), the Arnhem Land possum (Trichosurus arnhemensis), the very rare Thick-tailed Native-rat (Laomys woodwardi) and the flying possum or Sugar glider (Petaurus breviceps). Someday it will possibly be shown that the fauna and flora of the northern savannah is widespread across much of northern Australia, but owing to the general occurrence of buffaloes and cattle in the Northern Territory, there has been a great ecological upset of natural communities and in particular of the freshwater faunas of the streams and pools of the north. It is of utmost importance that an area (as yet relatively undamaged) containing these elements of the fauna and flora be preserved. Because this area combines these features with spectacular and exciting scenery the Sub-committee believes that it should be set aside as a National Park.

Location: $14^{\circ}35' - 15^{\circ}17'$ S
$126^{\circ}32' - 127^{\circ}12'$ E

State of Reservation:

Unnumbered and unclassified reserve West of Carson River. Remainder unreserved Crown Land.

Area: 1,086,080 acres approx.

Literature:

Hill, G. F. (1911). — Field notes on the Birds of Kimberley, North-West Australia. Emu 10 : 258-290.

Morgan, J. F. (1955). — Report on Central North Kimberley Region. North Kimberley Survey and Mapping Expedition, 1954. Western Australia. Dept. of Lands and Surveys. Perth. pp. 68.

Speck, N. H., J. Bradley, M. Lazarides, R. A. Patterson, R. O. Slatyer, G. A. Stewart, and C. R. Twidale (1960). — The Lands and Pastoral Resources of the North Kimberley Area, W.A. C.S.I.R.O. Land Res. Ser. No. 4 : 1-109.

Opinion: The Sub-committee is of the opinion that:

1. the area shown described above should be set aside as a Class A Reserve and vested in a Statutory Body having control of other National Parks;

2. a biological survey of the area should be carried out and following such survey an expert committee should select not more than one tenth of the total area for setting aside as reserves for public recreation, the remainder should be set aside for the preservation of fauna and flora, the whole to comprise a National Park.

38.— THE NAPIER-OSCAR RANGES AREA

The Napier and Oscar Ranges of the West Kimberleys include some of the most beautiful and striking scenery to be found in Western Australia, and it is very desirable that they be set aside as a National Park. In addition to the

scenic attractions of the area, which include the spectacular Windjana, Brooking, and Geikie Gorges, the area is of great geological and anthropological interest. The ranges are composed of Devonian limestones which formed a massive barrier reef some 300 millions years ago, comparable with the Great Barrier Reef which follows the Queensland coast today. Geologists recognize this fossil reef complex as the best example of its kind in the world.

The numerous caves of the area are decorated with Aboriginal paintings of great anthropological interest, and in the future these should prove to be important tourist attractions. At present the paintings are virtually untouched by vandalism and it is important that they be preserved for posterity.

Botanically the ranges are also interesting, because they contain species which are lime-loving, and C. A. Gardner estimates that the number of endemic species is about 15 to 20.

Specific areas of interest in the ranges are as follows:

Windjana Gorge:

Windjana Gorge is a picturesque narrow canyon cut through the Napier Range by the Lennard River, and is situated 70 miles east of Derby. Few people visit the gorge today owing to the poor conditions of existing tracks, but all who have done so regard it as one of the most beautiful localities in Western Australia. Recently the gorge was visited by Professor C. L. Camp, the noted American palaeontologist and world traveller. The following are some of his impressions:

> "The gorge is a chasm three miles in length, walled by vertical cliffs of dark limestone from 100 to 300 feet in height. The Lennard River runs through it in wet weather, and large pools remain along the river bed in the dry season. These pools are surrounded by green trees and shrubbery, with clean sand banks, and contain great 'island' rocks fallen from the cliffs. Here swim the zebra fishes, the shy, inoffensive Johnson crocodiles. The still waters reflect the dark cliffs, the clouds, and the

> sky, to produce scenes of great beauty. Birds of many kinds - dancing brolgas, flocks of cockatoos, hawks, kites, and waterfowl - may be seen in abundance. Their calls and screams echo in the depths of the gorge. The summits of the cliffs cut the skyline in sharp pinnacles and rugged saw-tooth patterns of fascinating variety. The walls are punctured by grottoes and caves where aboriginal paintings and burials may still be found untouched by vandalism. How long will this happy situation remain? If any supreme reason could be given for sequestration of this area it would be to preserve these evidences of the artistic ritualism of an ancient vanishing culture of unique interest".

On most maps of Western Australia the gorge is called "Devil's Pass", the name used by E. T. Hardman, the first geologist to visit the area (in 1883), and perhaps derived from the "devil-like" Aboriginal paintings in a cave just south-east of the eastern entrance to the gorge. However, "Windjana", the name applied to the gorge by the Unggumi Tribe, which occupied the country on the northern side of the Napier Range, is used exclusively by station people in the area, and was recently accepted by the State Committee on Geographic Nomenclature. The name given to the gorge by the Bunaba Tribe, which lived along the southern side of the Napier Range and along the Oscar Range, is "Talay".

The large cave near the eastern entrance to the gorge is decorated by numerous paintings of men and animals, the main figure being that of Wandjina, the rain god. The Wandjina cult is common to all the northern Kimberley tribes, and the great Wandjina galleries have attracted more interest and resulted in a greater volume of literature than any other Aboriginal rock paintings. The paintings in caves near Windjana Gorge and other parts of the Napier and Oscar Ranges include superb examples of this art, and are more accessible than galleries elsewhere in the Kimberley District.

Geologically the gorge is outstanding. The section exposed through the Devonian reef complex is the best found anywhere in the Kimberleys, and in years to come it will certainly be one of the most famous geological localities in the world.

The Windjana Gorge area is of historical interest, being the site of the famed Aboriginal uprising led by the Bunaba tribesman Pigeon (Sandamara). Pigeon's first victim, Constable Richardson, was murdered at Lillimaloora Police Station in October 1894, just 1½ miles east of the gorge. The ruined walls of this station still stand. Later the stockmen Burke and Gibbs were murdered at the entrance to the gorge, and this was followed by a great battle, between the Aborigines and the police investigating the killings, in the gorge itself.

Tunnel Creek:

Tunnel Creek is a stream which flows through the Napier Range in a large natural tunnel eroded through the limestone by the stream itself. This is a most unusual physiographic feature, and as such is of great interest to geomorphologists and geologists, quite apart from its scenic attraction.

The tunnel is about half a mile long, and is broken in the middle by a collapsed cave leading to the top of the range. This cave is usually festooned with large numbers of flying foxes. The tunnel contains permanent water, and it is possible to wade through from one side of the Napier Range to the other, provided one does not mind the risk of stepping on small freshwater crocodiles.

The outlaw Pigeon hid in the tunnel for long periods while recuperating from wounds inflicted by the police patrols.

Cave paintings are present near the north entrance to the tunnel, and Aboriginal burial caves occur nearby. The creek by the southern entrance was the site of a stone-axe factory, and many axe heads of black dolerite and basalt have been collected there by visiting geologists.

Oscar Range:

At the foot of the impressive limestone walls of the Oscar Range are many picturesque springs of fresh clear water. Pandanus palms and other trees grace the rocks around these springs, and wild life is abundant.

Among the most beautiful are the Wire Springs (known to the natives as Bulluloo) and Palm Spring (Wyrimba).

Professor Camp described the Oscar Range in the following terms:

> "This prominent feature of the Kimberley landscape runs like an old ruin, a black castellated wall, for a distance of some 40 miles. Along the entire length of this escarpment the cliff faces are perforated by cave entrances and fissures. These when partially eaten away by erosion produce the most varied and remarkable rock forms, windows, arches, spires, domes, and pinnacles, objects of continued interest to the traveller. Gaps in the more-or-less continuous cliffline open toward vistas of flowery park-like beauty. Great boab trees, like the upturned roots of monstrous root vegetables, grow in astonishing variety, sometimes literally spring from the rocks. Springs issue from the limestone to supply fine rock holes and pools, set about with palms and trees covered with climbing vines.
>
> Caves in abundance, along the entire length of the Oscar Range, contain the totemic Aboriginal paintings in red, white, yellow, and black. Natives in this area no longer make these paintings. Those that now remain are therefore the more worthy of preservation - and our generation will be called to account if vandalism occurs through lack of foresight or interest.
>
> In conclusion: the area is one of great potential as an undeveloped feature of this country. If attended to now, fenced and protected, it could eventually become a delightful attraction in a country where unique features of this sort are not too frequently found."

Brooking Gorge:

Brooking Gorge is regarded by some as being even more beautiful than Windjana Gorge. It is a long, narrow gorge eroded by Brooking Creek at the south-east extremity of the Oscar Range. The gorge contains a deep

Geikie Gorge (*Photo P. E. Playford*)

permanent pool of fresh water, with attractive patches of water lilies, and bordered by a dense growth of eucalyptus, pandanus, fig, Leichardt Pine, and other trees.

Wild life abounds in the gorge, and it is at present fenced off to prevent cattle following the gorge into the depths of the Oscar Range. The deep pool in the gorge is a delightful swimming spot.

Brooking Gorge is only 10 miles from Fitzroy Crossing, and is readily accessible on existing tracks. There is every reason to believe that it will become an outstanding tourist attraction in the near future.

Geikie Gorge:

Geikie Gorge is formed where the Fitzroy River has cut through the Devonian reef limestone at the junction between the Oscar and Geikie Ranges, 10 miles from Fitzroy Crossing. Permanent water is present along the river in the gorge, and it is stocked with abundant barramundi, crocodiles, and a number of fish species which are normally inhabitants of sea water. These include sawfish and sting-rays, the ancestors of which must have moved gradually up the river from the sea, a distance of some 200 miles. This is of great interest to zoologists.

Geikie Gorge was named by Hardman after Sir Archibald Geikie, one of the greatest of British geologists. The naming is appropriate, as the section through the Devonian reef complex at this gorge is magnificent, second only to that at Windjana Gorge.

Present Status of the Napier and Oscar Ranges:

The Napier and Oscar Ranges are at present held under pastoral leases by Napier Downs, Kimberley Downs, Fairfield, and Brooking Stations. These stations run cattle on the lowlands adjacent to the ranges, and use Windjana, Brooking, and Geikie Gorges, as well as the various springs in the ranges, as watering places for cattle. The station people endeavour to keep the cattle out of the ranges themselves because it is difficult to round them up in the rough country. Furthermore there is little satisfactory feed in the limestone ranges. The desecration of the beautiful springs and gorges by cattle is most unfortunate. In seasons of drought Windjana Gorge

becomes a trap for the emaciated beasts. Weak from lack of feed and the need to walk long distances for water, they collapse and die in the gorge after drinking their fill. The stench of hundreds of rotting bodies is overpowering in such bad seasons. Similarly around the other points in the ranges, the bones and bodies of dead cattle are all too common.

In the event of parts of the ranges being declared a National Park, the gorges and springs will need to be fenced off, as has already been done in the case of part of Brooking Gorge. Alternative watering places will then need to be provided for the stock, and this can be done by piping water from the springs, or by the sinking of bores away from the ranges.

Location: 17°20' - 18°10' S
124°50' - 125°45' E

State of Reservation:

Not reserved (1961).

Area: 123,000 acres approx.

Literature:

Guppy, D. J., Lindner, A. W., Rattigan, J. H., and J. N. Casey (1958). — The geology of the Fitzroy Basin, Western Australia. Bur. Mineral Resources Bull. No. 36, 116 p.

Playford, P. E. (1960). — Aboriginal rock paintings of the West Kimberley region, Western Australia. J. roy. Soc. W. Aust. 43 : 111-122.

Opinion: The Sub-committee is of the opinion that:

1. the ranges and gorges described above should be excised from the pastoral leases which at present contain them and should be set aside as Class A Reserves;

2. an expert committee should survey the area and recommend that certain parts be selected and gazetted for public

recreation, and others for the preservation of aboriginal and archaeological sites, for fauna and flora, and for geological purposes;

3. the whole area should be vested in a Statutory Body having control of other National Parks and be classified as a National Park;

4. that bores or other facilities for watering stock should be provided in order to compensate the present leaseholders for the loss of pools in the gorges and springs in the ranges.

SUMMARY : STATE OF RESERVATION

Summary of state of reservation of the different areas recommended by the Sub-committee on National Parks and National Nature-Reserves in Western Australia.

	Reserves, 1961	Areas requiring reservation
1	Nornalup National Park	
2	Porongurup Range National Park	
3	Stirling Range National Park	
4	Margaret River-Hamelin Bay Area (part)	Margaret River-Hamelin Bay Area (part)
5		Ludlow State Forest (Southern Portion)
6	Mandurah Area (part)	Mandurah Area (part)
7	Pingelly and Dryandra Reserves (part)	Pingelly and Dryandra Reserves (part)
8		Serpentine Area
9	John Forrest National Park	
10	Yanchep Park	
11	Lake Magenta Reserve	
12	Fitzgerald River Reserve	Fitzgerald River Reserve (additional area)
13		Toodyay, State Forest No. 61.
14	Murchison River Reserve	Murchison River Reserve (additional area)

15	Mt. Lesueur Reserves	Mt. Lesueur Reserves (additional area)
16	Houtman Abrolhos Reserve	
17	Rottnest Island Reserve	
18		Garden Island
19	Bald Island Reserve	
20	Recherche Archipelago Reserve	
21	Cape LeGrand National Park	
22	Cape Arid Reserve	
23		Twilight Cove Area
24		Bremer Range Area
25	Lake Barker Reserve	
26		Northern Nullarbor Area
27		Mt. Manning Range Area
28		Lake Disappointment Area
29		Queen Victoria Spring Area
30		Barlee Range Area
31	Hamersley Range Area (part)	Hamersley Range Area (part)
32		Dampier Archipelago Area
33	Barrow Island Reserve	
34	Bernier and Dorre Islands Reserves	
35		Point Coulomb (Dampier Land) Area

36	Prince Regent River Area
37	Drysdale River Area
38	The Napier-Oscar Ranges Area

CHAPTER 6

Geological Reserves in Western Australia

This section lists areas which the Sub-committee proposes should be reserved for geological purposes. They are of three main types:

(a) Localities which have been designated in publications as type sections of important geological formations and should therefore be preserved for scientific reference purposes.

(b) Areas used extensively for teaching purposes, and which exhibit geological features not developed at any other easily accessible localities.

(c) Geological features of especial interest such as the Wolf Creek Meteor Crater and the glaciated pavements of the Pilbara.

Some of these areas, although chosen primarily for their geological interest, could be developed into National Parks with wide tourist appeal. An outstanding example is the Wolf Creek Meteor Crater. Other areas of special geological interest, such as the Oscar-Napier Range and the Gorge of the Murchison River are also important from the point of view of scenery, biology, or anthropology, and are proposed as reserves in Chapter 5 of this report.

The list of proposed geological reserves has been prepared after consultations with the Bureau of Mineral Resources, Canberra, the Geological Survey of Western Australia, the Department of Geology of the University of Western Australia, and the Western Australian Division of the Geological Society of Australia. These bodies have been most helpful in supplying information and their assistance is gratefully acknowledged.

The following controls are regarded as essential for the protection of geological reserves:

(a) Building, or construction work of any kind, should be undertaken only with the approval of the controlling authority.

(b) Mining, quarrying, dam-construction, or any other activity involving the destruction of rock outcrops, should be controlled. The designation of an area as a geological reserve need not necessarily preclude its use for the purposes mentioned. The important thing is that authorization of destructive activities should rest with a responsible scientific body.

(c) Although it would usually be necessary to restrict cultivation on geological reserves, there seems to be no reason why they should not be used for pastoral purposes.

(d) Unrestricted collecting, particularly of fossils, must be prohibited. This is especially important in the south-western portion of Western Australia, where few richly fossiliferous localities are known. Today it is almost impossible to find specimens of certain fossils which were formerly abundant in the Irwin River and Geraldton districts. As roads improve, and the population becomes more mobile, one may expect the depredations of the casual collector to become even more apparent. It is therefore suggested that the collection of at least certain species within geological reserves should be subject to restrictions similar to those which apply to many elements of our present flora and fauna.

(e) Access to a geological reserve must be guaranteed, at least to professional geologists, students, and other people with a genuine scientific interest in the area. At present access to geologically important areas is not a problem in Western Australia, and the overwhelming majority of property owners are most co-operative. However, with closer settlement it may become as subject to the whims of individual landowners as it has in some other Australian States. At the same time the regulations governing the purposes of geological reserves should be framed to give neighbouring property owners adequate protection from additional fire risks and intrusions on their rights.

PROPOSED RESERVES

1. KIMBERLEY DIVISION

38[1]— OSCAR-NAPIER RANGE

Area: 123,000 acres approx.

Four areas in the Oscar-Napier Range area have been proposed as Class A reserves in Chapter 5. They are referred to again here in order to emphasize the great geological importance of these areas.

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[1] As in the preceeding chapter, the numbers given here with each proposed reserve are the locality numbers in the map which accompanies this report.

The Napier and Oscar Ranges represent an exhumed Devonian reef complex in an exceptionally favourable condition of preservation and exposure. The proposed Class A reserves at Windjana Gorge, Oscar Range, Brooking Gorge, and Geikie Gorge, include the best exposed sections known through the reef complex. Windjana Gorge in particular is perhaps the most important geological locality in Western Australia, at least from a stratigraphical point of view. However, these reserves do not include the most fossiliferous exposures found in the reef complex, and for this reason a special geological reserve is proposed at Bugle Gap.

39.— BUGLE GAP

Location: Approx. 18°40' S
126° 5' E

Area: 40 square miles approx.

Remarks: Bugle Gap is recommended primarily as a geological reserve, though it is also scenically attractive. The Devonian reef complex is well exposed in this area, and the richly fossiliferous basin facies, which is not exposed in the Napier and Oscar Ranges, is well developed here. The ammonoid fossils from Bugle Gap are already world famous, and extensive collections of other fossils from the gap are now being studied in America.

40.— WOLF CREEK METEOR CRATER

Location: Approx. 19°12' S
127°51' E

Area: 5 square miles approx.

Remarks: This crater, one of the largest known on the earth's surface, was described by Guppy and Matheson in the Journal of Geology, vol. 38, 1950. The crater has attracted world-wide interest and was recently featured in a nation-wide television programme in America ("CBS Presents") as a typical example of a meteor crater on earth which resembles those found on the moon.

The Wolf Creek Meteor Crater is of great scientific and scenic importance, and its reservation is an urgent matter.

41.— PRICES CREEK

Location: Approx. 18°39' S
125°55' E

Area: 2 square miles approx.

Remarks: This area includes the type sections of the only marine Ordovician formations known to be exposed in Western Australia. Rich fossil collections have been described from the locality.

42.— MT. WYNNE

Location: Approx. 18° 2' S
124°31' E

Area: 1 square mile approx.

Remarks: Type sections of the Lower Permian formations are exposed in this area, including exposures of the richly fossiliferous Nura Nura Member of the Poole Sandstone.

43.— MT. HARDMAN

Location: Approx. 18°18' S
124°39' E

Area: 1 square mile approx.

Remarks: This area is the type locality for the Hardman Member of the Liveringa Formation, from which important fossil collections have been made.

44.— BRUTENS YARD, Cherrabun Station

Location: Approx. 18°43' S
125°37' E

Area: 10 square miles approx.

Remarks: This area includes the type section of the Permian Noonkanbah Formation.

2. NORTH WEST DIVISION

45.— CARAWINE GORGE

Location: Approx. 21°17' S
121° 2' E

Area: 1 square mile approx.

Remarks: The best exposures of Permian glacial pavements known in Western Australia are present at this locality. The area is 3 miles north-west of the gorge.

46.— MINILYA RIVER, Wandagee Station

Location: Approx. 23°44' S
114°25' E

Area: 5 square miles approx.

Remarks: The most fossiliferous exposures found in the Permian Byra Group occur in this area, especially in the type section of the Wandagee Formation. Among the well known fossils from this section is the remarkable crinoid Calceolispongia.

47.— WANDAGEE HILL

Location: Approx. 23°44' S
114°30' E

Area: 2 square miles approx.

Remarks: The Wandagee Hill area includes the type sections of fossiliferous Permian formations.

48.— MUDERONG BORE AREA, Middalya Station

Location: Approx. 24°08' S
114°47' E

Area: 20 square miles approx.

Remarks: The type sections of several Permian and Cretaceous formations occur in this area, in addition to interesting structural features.

49.— WILLIAMBURY STATION

Location: Approx. 23°15' S
115°10' E

Area: 2 square miles approx.

Remarks: The type section of the Carboniferous Moogooree Limestone is exposed in this area.

49.— GNEUDNA PADDOCK, Williambury Station

Location: Approx. 23°58' S
115°10' E

Area: 2 square miles approx.

Remarks: The type sections of the richly fossiliferous Devonian formations are exposed in this area.

50.— MERLINLEIGH STATION

Location: Approx. 24°19' S
115°12' E

Area: 1 square mile approx.

Remarks: The type section of the Merlinleigh Sandstone (Eocene) occurs in this area.

51.— MOOGOOREE STATION

Location: Approx. 24° 5' S
115°10' E

Area: 1 square mile approx.

Remarks: The area includes the type section of the Lower Permian Newman Formation.

52.— WOORAMEL RIVER

Location: Approx. 25°50' S
115°25' E

Area: 1 square mile approx.

Remarks: The area includes the type section of the richly fossiliferous Callytharra Formation.

3. SOUTH WEST DIVISION

14.— THE MURCHISON RIVER GORGE

Area: 438,000 acres approx.

In Chapter 5 it has been proposed that a Class A Reserve be gazetted in the Murchison River area to in-

clude most of the river gorge between Bettie Crossing and Hardabut Pool, an area of sand-plain, and the coastal cliffs between Wittecarra Gully and Bluff Point. The proposed reserve is referred to again here in order to emphasize its geological importance.

The Murchison River Gorge is one of the most remarkable physiographic features in Western Australia. It owes its origin to uplift of the area in comparatively recent times, which has caused the river to cut down rapidly into its bed in order to maintain its course. The incised meanders in the gorge, especially "The Loop", are particularly impressive.

Magnificent exposures of the Lower Silurian and Upper Ordovician (?) Tumblagooda Sandstone occur in the gorge, which has been chosen as the type section of the formation. The Tumblagooda Sandstone is extremely interesting to stratigraphers and sedimentologists as a typical "Red Beds" succession. The unit is also very well exposed in the coastal cliffs south of Red Bluff, and that area also includes the type section of the Jurassic Wittecarra Formation.

53.— BINDOO SPRING, Greenough River

Location: 28°29'50" S
115°12'15" E

Area: 4 acres along river bank approx.

Remarks: This is one of the finest exposures of Permian tillite in Australia, and is used annually for instruction purposes by the University of Western Australia.

54.— WOODERARRUNG CREEK, Mullewa District

Location: Approx. 28°30' S
115°29' E

Area: 6 acres along the river banks approx.

Remarks: This contains the only well-preserved Permian varves in the Perth Basin, and as a result is used for teaching. Tillites and metamorphosed Precambrian sediments and igneous rocks are exposed within the area.

55.— BRINGO RAIL CUTTING, Geraldton District

Location: 28°44'54" S
114°50'54" E

Area: 2 acres in a strip on either side of the railway line approx.

Remarks: This is the best known exposure of marine Jurassic in Australia, and provides type sections of several formations. It is illustrated in W. J. Arkell's text-book "Jurassic Geology of the World". It includes the type sections of several Jurassic formations of the Perth Basin.

The section exposed in the cutting is used annually for teaching purposes by the Geology Department of the University of Western Australia.

55.— BRINGO DISTRICT

Location: 28°45' S
114°50' E

Area: 1 acre approx.

Remarks: This area is in the headwaters of a small creek flowing south-west from near Bringo Cutting. Richly

fossiliferous Middle Jurassic limestone of the famous Newmarracarra Limestone is well exposed in the creek bed, and is used annually for teaching purposes.

56.— IRWIN RIVER, FOSSIL CLIFF AREA

Location: 28°56'35" S
115°32'35" E

Area: 1 square mile along the North Irwin River approx.

Remarks: This is perhaps the most widely known sedimentary locality in Western Australia, and is a most important teaching area. It includes the type sections of the Fossil Cliff Formation, High Cliff Sandstone, and Irwin River Coal Measures. Richly fossiliferous sediments are exposed along the river bank.

56.— IRWIN RIVER, Nangetty Station

Location: Approx. 29°00' S
115°26'30" E

Area: 1 acre along Tillite Creek approx.

Remarks: This includes the type section of the Nangetty Formation, with good exposures of tillite containing striated boulders and pebbles.

57.— COOMBERDALE, KIAKA CLIFF

Location: Approx. 30°30'20" S
116°02'25" E

Area: 1 acre approx.

Remarks: Excellent exposures of Coomberdale Chert occur in this cliff, showing slumping phenomena, and including breccias and problematic fossils. It is used annually for teaching.

58.— TOODYAY

Location: Approx. 31°35' S
116°30' E

Area: ½ acre approx.

Remarks: Exposed in this area is cordierite-anthophyllite-spinel hypersthenite, described by Professor R. T. Prider in the Geological Magazine for 1940. These rocks are rare and interesting, and should be preserved for students and future workers.

59.— QUAIRADING

Location: Approx. 32°05' S
117°25' E

Area: 2 acres approx.

Remarks: This is one of the few areas in the world from which the mineral sapphirine has been recorded.

4. EASTERN DIVISION

60.— COOLGARDIE

Location: Approx. 31°10' S
117°25' E

Area: 2 square miles approx.

Remarks: Although this area is not of special geological significance, it has historical associations with the early gold discoveries, and its reservation could also be justified as a recreation area.

61.— KALGOORLIE - BLACK FLAG AREA

Location: Approx. 30°50' S
121°15' E

Area: 2 acres approx.

Remarks: The area includes good exposures of the Black Flag Beds, of Archaean age, with well developed folding.

CHAPTER 7

Aboriginal Sites in Western Australia

In many places in Western Australia there are monuments left by the native peoples. These range from simple camping grounds to elaborately painted caves. Active research by the Museum, the University and the Anthropological Society is at present going on in order to gather information both from aborigines who know the legends related to sites and from excavations of archaeological sites. As a result of this work it is hoped that a full list of all sites in Western Australia will be prepared; and that out of this will come recommendations on the need for preservation of particular sites. Among the sites which are already relatively well known, the cave paintings of the Oscar and Napier Ranges, the petroglyphs of Woodstock, Woolgorong, Mount Herbert, Depuch Island, and the great ochre mine at Wilgie Mia are clearly outstanding.

Aboriginal monuments are of scientific and cultural value in Australia. From the scientific point of view they are relevant to studies in archaeology, ethnology and comparative art. From the cultural point of view they can enrich our own Australian heritage. The enrichment will arise from the appreciation by white

Australians of Aboriginal material culture; in this way white Australians will gain greater sympathy and awareness of the aboriginal people themselves. By preserving such "historical monuments" as part of our common heritage, we may encourage among Aborigines and part-Aborigines justifiable pride in their own traditional background. To the modern Australian, these monuments will be part of the heritage which we have made our own. It is a sad commentary in our own culture today that so much vandalism is at present occurring at the more accessible aboriginal sites that it is at present judged wisest not to publish a full list of the sites we know of here.

RECORDED STUDIES OF ABORIGINAL SITES IN WESTERN AUSTRALIA

A number of articles have been published over the years on aboriginal sites in Western Australia: these have mostly appeared in scientific journals in Australia and overseas and in the accounts of explorers. No full bibliography has been published, but Davidson (1952) is probably the most complete, Petri (1960a, 1960b) contains a useful discussion of the distribution of art styles and McCarthy (1958 : 63-64) has mentioned that 50 or 60 sites of pictographs are known.

The articles listed in the bibliography vary considerably in the amount of data that they contain on aboriginal sites: some duplicate the work of others; some simply note the presence of a particular rock shelter, painting, incising, and so on, and give no further details, or only the bare minimum. Few sites are considered in archaeological and ethnological terms.

Quite often guesses are made as to the meaning and significance of certain designs even though aborigines may be present who could have offered at least some key to this information. There are some exceptions, but these refer mainly to the Northern Kimberley sites: even here, however, all the information we now need is not available. There are certainly some very good general records, complete

with photographs and descriptive material, along with cultural data, in relation to meaning and significance in aboriginal terms, but in many cases the data that are available for such sites are very limited.

The position most clearly revealed by a glance at the published material on this topic is that there has been only a very slight amount of detailed anthropological, archaeological and ethnological research in this field.

INTEREST IN ABORIGINAL SITES

Three institutions in Western Australia are concerned with the preservation of aboriginal sites. These are the Western Australian Museum; the Anthropology Department at the University of Western Australia; and the Department of Native Welfare.

The Department of Native Welfare, through its district officers, is in a relatively good position to report on new sites and on the upkeep of well known ones. It is not always in a position to make detailed surveys of such sites, nor are its officers professionally trained in this direction. Any work the Department of Native Welfare can undertake here must be subsidiary to its main focus on Aboriginal Welfare.

The Anthropology Department of the University of Western Australia is at present concentrating on programmes relating to living people, the Australian Aborigines being one of its interests. Where aboriginal sites are still significant to the people studied, and the designs etc. meaningful to them, they are taken into consideration as part of the normal anthropological field research. Further, the anthropological research worker is usually interested in such sites within his area, but their detailed examination is subsidiary to his main focus. He will normally report the presence of such sites, take photographs and gather information, but he

will not generally make a detailed survey. Such a research worker is, therefore, a valuable person who is in the position to gather information directly and to report his findings to those who specialise in material culture.

The Western Australian Museum is even more directly concerned with the preservation of sites and of aboriginal objects. The Curator of Anthropology and Archaeology, and his assistants have carried out field work recording and photographing sites, while the Museum is a centre to which members of the public report the existence of old camping grounds, ceremonial grounds and art sites. Some excavation by the Museum staff has been carried out, the most important being at the red ochre quarry Wilgie Mia.

In addition to official organisations, two Societies in Western Australia have been particularly interested in aboriginal sites. These are the Anthropological Society of Western Australia and the Western Australian Naturalists' Club. The Anthropological Society was only founded in 1959 and in response to the request of the Western Australian Sub-committee, prepared a report on the conservation of sites and a list of sites which form the basis of this section of the Academy Sub-committee's Report. The work of preparing and collecting the material was done by a committee comprising Dr. R. M. Berndt (President), Mr. V. N. Serventy (Chairman of the Committee), Mr. F. W. G. Andersen and Mr. G. Kenney.

The Western Australian Naturalists' Club (especially V. N. Serventy, W. H. Butler, C. J. Davies, E. Lindgren, S. R. White and B. Wright have long been interested in the preservation of sites and have drawn attention to a number of them. Several papers on this topic have been published in the Western Australian Naturalist.

The ordinary public shows a general interest in cave paintings etc. but has had very little real opportunity to develop it except through books. In areas with native populations who are traditionally oriented, or partly oriented, sites have some significance to aborigines, but we do not know how much they value their continuance. On the other hand, modern white Australians are likely to value aboriginal sites as a

consequence of their personal knowledge of them, and we feel that there is some urgency in cultivating this interest as a means of increasing awareness of the need for preservation.

LEGAL PROTECTION OF HISTORIC AND CULTURAL ABORIGINAL SITES IN WESTERN AUSTRALIA

Regulations giving protection to aboriginal sites in Native Reserves in Western Australia are given below but neither the Land Act nor the Native Welfare Act specifically covers the preservation of aboriginal sites. A number of these sites are to some extent protected by being on Aboriginal Reserves, but their preservation here is no more than a secondary consideration, and - as will be seen below - there is little adequate protection against unauthorised interference and vandalism. Nor have sites which have been protected by placing them on Aboriginal Reserves adequate protection against alienation by act of authority.

The Land Act 1933-1958 states a number of purposes under which land can be set aside for reserves. These include "the use and benefit of the aboriginal inhabitants". There appears to be little reason as to why land has not been reserved for the preservation of archaeological or historic sites, etc., but the Act has scarcely been used in this way. If land was to be so reserved and vested in some competent authority, it would enjoy the same measure of protection which the Land Act affords to reserves for fauna and flora, etc.

Under Section 31 of the Land Act, reserves may be classified into different classes of security; and of these, only Class A Reserves may be considered to be reasonably safe against alienation by local, departmental or other authoritative action. Class A Reserves are proclaimed by the Governor and "shall for ever remain dedicated to the purpose declared in such proclamation, until

by an Act of Parliament in which such lands are specified it is otherwise enacted" (Land Act, Sect. 31, 1). (For a survey of legislation relating to reserves gazetted under the Land Act, see the section on Legal Protection of National Parks and Nature Reserves).

Although we know of only one case of an aboriginal site which has been specifically reserved under the Land Act (i.e. Wilgie Mia), many aboriginal sites have been inadvertently protected by being located on reserves for "the use or benefit of the aboriginal inhabitants". Of the known sites, Depuch Island, Langgi, Port Hedland, Purulba, Nyimundum, Jackson Island and Wurwai are on such reserves. The Native Welfare Act 1963 provides under Sect. 7(e) that it shall be the duty of the Department of Native Welfare "to manage and regulate the use of all such reserves set apart for the benefit of natives". Sect. 18 of the Native Welfare Act provides that the Governor may, by proclamation —

(i) declare any Crown lands to be reserves for natives;

(ii) alter the boundaries of a reserve;

(iii) abolish a reserve.

Other parts of the Act which would affect sites in reserves are as follows :

Sect. 19

(1) "The Minister may appoint fit and proper persons to be superintendents of reserves."

Sect. 20

(1) "It is an offence for any person other than a native to enter or remain or be within the boundaries of a reserve for any purpose whatsoever, unless he is a manager or an officer of the Department, or a member of either House of the Federal or State Parliaments or a person authorised in their behalf under the regulations."

It is specifically stated in Section 37 (2) that the Governor may make regulations

(i) "providing for the control of reserves and the supervision of natives on reserves;"

(j) "authorising entry upon a reserve by specified persons or classes of persons for specified objects, and the conditions under which those persons may enter or remain upon a reserve, and providing for the revocation of such authority in any case."

Various Regulations apply to Reserves but those most closely related to the situation under consideration are :

Regulation 20, Authority to Enter Reserves.

"Members of the police force, public health officials, and officers of public authorities are persons authorised under these regulations to enter or remain within the boundaries of a reserve, if and so long as any such authorised person so enters and remains for the purpose of the lawful exercise and performance of the functions and duties appertaining to his office to the degree permitted in the community in general."

Regulation 21, Permission to enter Reserves.

(1) "Whenever any person, not being a native or a person authorised under the Act or these regulations to enter or remain within the boundaries of a reserve, desires for any stated reason to enter or remain in any reserve, he shall apply to the Commissioner for permission so to do and the Commissioner may recommend the Minister to grant such permission to enter accordingly."

(2) "The Minister may in his discretion grant the permission referred to in subregulation (1) of this regulation which permission shall be in the Form No. 7 in the First Schedule to these regulations, and shall specify therein the conditions to be observed by the person to whom it is granted, but the Minister may at any time, if he thinks fit, revoke any permission so granted.

In practice there are two main reasons for the reservation of land for natives :

(a) Retention of areas for immediate or future use by natives in a social or economic sense.

(b) Preservation of areas for ethnological, historical or cultural reasons.

Those areas referred to in (a) above are of only passing interest in this report and the legal requirements for security of reserves of this type are different from those in (b), because care must be taken to allow these to be alienable so that, at future times, titles may be established for them and they may be transferred to owners either as freehold or leasehold land. All that is required in this case is that there should be sufficient safeguards to prevent alienation of such land excepting with the consent and recommendation of the Commissioner for Native Welfare who, however, should not be restricted in the management or transfer of such land.

As can be seen, the legislation under which Native Reserves are controlled contains restrictions regarding entry to reserves but these can be circumvented. Furthermore, the policing of entry to reserves is virtually impossible, excepting where there is a Manager in the vicinity.

It is abundantly clear from the expressed opinions of various societies, individuals, and officials that many aboriginal sites should be preserved in perpetuity for historical, ethnological and cultural reasons. Further, there seems little reason why such sites should not receive the same degree of protection as is afforded to Class A Reserves under the Land Act. In addition, the historical survey which forms the early part of this report has indicated the great value of vesting such reserves in a competent authority under the provisions of the Parks and Reserves Act, 1895. Such a body could, with statutory authority and adequate finance, ensure effective preservation.

OPINION

The preservation of at least a representative series of Aboriginal Sites in Western Australia is clearly a matter of some urgency. Legislation exists whereby this can be done and it is our opinion that:

(a) an advisory committee should be set up to examine anthropological sites in Western Australia with a view to recommending the permanent preservation of the more important of them;

(b) an amendment should be made to Section 29(1) of the Land Act 1933-1958 in order to include "anthropological and archaeological sites" as an object and purpose under which Crown land may be reserved, and

(c) an authority should be set up to control such reserves under Sect. 33 of the Land Act 1933-1958, and

(d) reserves vested in this authority should be classified as Class A Reserves under the provisions of Sect. 31 of the Land Act 1933-1958.

THE KINDS OF ABORIGINAL SITES IN WESTERN AUSTRALIA

At the request of the publication committee of this edition of the Report, Mr. I. M. Crawford, Curator of Anthropology at the Western Australian Museum, has provided general comments on aboriginal sites in Western Australia to enable readers to appreciate such sites that they know of, or discover, so that they may understand them better. This section

is not in the original report presented to the Academy.

KIMBERLEY

Description of the area

The term Kimberley is here used to cover the area of Western Australia lying between Broome and the border of the Northern Territory; it is bounded on the north by the coast and on the south by the Fitzroy River Basin, Christmas Creek and extends across to the border. It includes Dampierland.

The Art-Pictographs

The most spectacular of the Kimberley paintings are of the Wandjina type which have become justly famous both in Australia and overseas. They are often referred to in English and German literature (e.g. Petri, 1960; Lommel, 1959). These are very large figures, sometimes over 20 feet long, representing mythical beings who travelled through Kimberley leaving their images in caves and rock shelters. Paintings are of a stylized type and include a large head with a halo (usually taken to represent cloud and lightning), large eyes and nose but no mouth. The Wandjina is sometimes represented by the head only, but if the bodies are painted they are decorated with stipple marks and include bands of colour representing hair belts on the waist and knees, and sometimes on their arms. The term "Wandjina type" is here used to include these figures although the actual Wandjina myth probably relates only to some of these, the others being representatives of other mythical beings but painted in the same style. The Wandjina type of paintings are common in the western half of Kimberley and extend down to the Oscar and Napier Ranges and as far north as the coast near Kalumburu. An important Wandjina centre is on Gibb River Station, and the Wandjinas are well recorded in the area between the Prince Regent River and Walcott inlet. Heads of the Wandjina type have been found further east but, on the whole, the Wandjina paintings seem to be rare in the eastern half of Kimberley.

Animal paintings are usually stylized, the body being filled in with one colour and the outline made of a series of white dots or white lines. The figures are fairly crude in execution. Most common motifs include the snake, especially the water python, as well as kangaroos, emus, crocodiles and turtles. Paintings of animals and Wandjinas are often found together, in which case the animals and Wandjina were mythically associated. However in the eastern half of the Kimberley, where Wandjina types are rare, animal paintings are much more predominant.

In complete contrast to the large, crude, Wandjina figures are the paintings called "Bradshaw" figures by anthropologists. These are painted in what Lommel (1959) has called the "elegant style", being often delicately represented, the height of the figures is often less than one foot. The figures are often shown in a dancing position and they wear long head-dresses and tassles on the arms and legs. Associated with these figures are paintings of boomerangs and bi-laterally barbed spears, of a type not now found in the Kimberley. From this evidence Lommel (1959), and Schulz (1956) have concluded that it is an archaic art form. The Bradshaw figures have been found in the Kalumburu area and in the western half of Kimberley, but appear to be rare in the eastern half of Kimberley.

The Art-Petroglyphs

Rock engravings appear to be very rare in Kimberley. There are sporadic examples throughout Kimberley, Prudhoe Island on the west coast being the most spectacular so far examined. Engravings have been reported from Dampierland, Sunday Island and Koolan Island, but records of them have not yet been made.

Stone Arrangements

Stone arrangements are also rare, and so far have only been recorded in the western coastal area. Some of these stone arrangements relate to the movements of the Wandjinas, and others to the movements of snakes.

Increase sites, consisting of small rock piles surrounded by small rubbing areas are also rare. They have been recorded on the west coast of Kimberley and near Forrest River Mission (Kaberry, 1936) in other places they may have been missed by people intent on recording more spectacular art in the area.

State of Knowledge

The Wandjina paintings were first recorded by Grey in 1838 when he visited the west coast area in the vicinity of the Glenelg River. These paintings were later rediscovered by H. Coate in 1948. Love and Elkin both recorded paintings in the 1930's and their work was followed up by the Frobenius Expedition in 1938. Schultz (1956) has published a collection of tracings made of paintings on this expedition and Lommel (1959) has published another series of these.

Recent work has been done by Playford (1960) who investigated the Oscar-Napier Range area as well as some sites south of the Fitzroy. Mr. H. Coate is currently collecting myths relating to the paintings in the Kimberley area and has so far concentrated on the western Kimberley area. The Western Australian Museum is also making a series of expeditions to record in a systematic manner the art of selected areas of Kimberley. The Museum will publish a book with coloured photographs of these paintings.

It should be noted that large areas of Kimberley still remain unexplored. Distribution of known sites is limited to areas where settlement has taken place, such as Forrest River Mission, Kalumburu Mission, the now abandoned Kunmunya Mission, Sale River Station, the Oscar-Napier Range and the Ord River area, but the central Kimberley area is almost unknown and only the reports of surveyors are available for it. It seems unlikely that it will prove any less rich in art than the areas so far investigated, and if this turns out to be the case, there is an enormous area of Kimberley from which art is still to be recorded.

THE NORTH-WEST

Description of the Area

For the purposes of this report, the North-West is defined as the area between Port Hedland and the Gascoyne River, extending from the western coast eastwards to Jigalong Mission. It includes the Hamersley Ranges, as well as many other ranges and innumerable rock outcrops. The area is extremely rugged.

The Art-Petroglyphs

The area is extraordinarily rich in rock engravings; in fact the sheer number of them is overwhelming. Individual sites are known to contain thousands of engravings. McCarthy (1962) has estimated that there are over 7000 separate engravings on the limestone ridges near Port Hedland and Crawford (1964) has estimated that there are 5000 on Depuch Island; Wright believes that some of the other centres which he has visited during 1963-4 may be even richer than these. There is a wide distribution of sites which, while they are not as rich as those mentioned above, still contain large numbers of engravings. The total number of engravings in the area could be as high as 100,000 but it will take years of exploration before anything like the total number can be firmly estimated.

Although an enormous amount of field work is still needed, it is already clear that the area is one of the richest rock-art centres in the world. While an enormous amount of the art is repetitive and crudely executed, included in it there are some magnificent engravings. The "Two Brothers" on Depuch Island and the "Gurangara" engravings on Woodstock Station are comparable with the rock art of South Africa, Europe and America.

Many of the engravings have an attractive appearance. The rocks in the area have weathered to form a brown crust, and the aborigines broke through this crust to expose a yellow layer underneath. The

engraved areas thus stand out yellow against a brown background. In places where the rocks did not weather in this way, the engraved areas are discernible by the contrast between light and shadow in the engraved and untouched areas.

Anthropomorphic figures make up a large proportion of the engravings. They range in size from small stick men no longer than a finger, to giant-like figures eight to ten feet high. An outstanding variety are the so called "Guragarra" figures found by Father Worms near Woodstock Station. These are thin figures showing men and women with enormously exaggerated genitalia. Birth scenes, and figures in sexual intercourse are common on Depuch, where scenes representing the spearing of men and animals also occur.

Representations of animals are extremely common. In the coastal area, and on the off-shore islands, the marine fauna is represented by engravings of turtles, sharks, and whales. Inland areas contain more engravings of kangaroos, emus and snakes. All areas contain engravings of spears, boomerangs and other objects belonging to the aborigines.

There have been several attempts to divide the engravings into different styles and sequences of styles. Worms (1954) distinguished between the animal-outline engravings of Port Hedland, and the anthropomorphic designs near Woodstock Station which he claimed were more recent. McCarthy (1961, 1962, 1964) has concluded that there is a sequence of styles, engravings with naturalistic outlines and stick figures, linear and geometric designs and intaglio figures successively replacing each other. Crawford (1964) attempted to construct a sequence of styles based on the apparent state of weathering of the engravings, but found by petrological analysis, that the appearances of the engravings was not necessarily related to their age. He was not able, therefore, to determine any sequence of styles.

The Art-Pictographs

In contrast to the huge quantities of engravings, paintings are extremely rare and do not form an

important part of art in the North-West. The only paintings so far recorded are a dozen or so examples near Wittenoom Gorge and Hooley Station, and these represent themes similar to those seen among the engravings.

Stone Arrangements

Few stone arrangements have been recorded, but field workers have observed that individual stones have often been stood on end. These stones are sometimes engraved, but are often plain. It is thought that they sometimes represent graves, although the places where some of these upright stones are found seems to preclude this interpretation.

State of Knowledge

The systematic investigation of the rock engravings in the North-West has only just begun, and therefore the distribution of sites is not properly known. The rugged terrain has prevented the investigation of many areas and most workers have been confined to short periods of field work. Some sites have become well known and have attracted the attention of successive investigations. The Depuch Island engravings were first described by Wickham (1843) and Stokes (1846), were later examined by members of the Frobenius Expedition (Petri and Schulz, 1951), McCarthy (1961) and Crawford (1964). A monograph on the Port Hedland engravings has been published by McCarthy (1962). A selection of the Woodstock engravings was published by the late Father Worms (1953, 1954). Wright has illustrated many of the Hooley Station engravings (1964) and plans to publish other sites which he has recently investigated during the next year.

The recording of sites by Wright during 1963-4 has done much to fill in gaps in the distribution of engravings. But at this stage, almost nothing is known of the role of the engravings in aboriginal traditional life. Various suggestions have been put forward as to the use of the art, but none are founded on really reliable information. There is an urgent need to complement the record of the art with anthropological studies.

THE MURCHISON AREA

Description of the Area

The area here termed Murchison extends from the Gascoyne River south to Perth and east to Nannine and Lake Brown. The geography of the area is very varied, but most of the art is in the breakaway country.

The Art-Petroglyphs and Pictographs

The area contains a mixture of engravings and paintings in roughly equal numbers. None of the sites is as spectacular as those in Kimberley or the North-West.

Paintings are almost entirely of the stencil type. Hands, feet and boomerangs are common, and the artist has simply held the object against a wall and sprayed red or white ochre over it leaving a stencil outline. Other art forms include paintings of small stick figures, meandering lines, bird and kangaroo tracks. The only painting which breaks the monotony of stencils, lines and tracks, is the "sun" at Gwan-bygine Cave, near York. The "sun" resembles a wheel with radiating spokes.

The rock engravings are unimpressive compared with those in the North-West. Animal and bird tracks exist, together with geometric designs such as con-centric circles with radiating spokes, and horseshoe like designs.

Stone Arrangements

In the upper Murchison area, there are numerous stone arrangements. There are lines of stones represent-ing some parts of mythical animals and men. These sites were once ceremonial areas and considered to be sacred.

Red Ochre Quarry — Wilgie Mia

Situated on the south side of the Weld Range about two miles south west of Mt. Lulworth is the famous ochre quarry called Wilgie Mia. This enormous ochre quarry, which consists of a man-made cave 120 feet long and 60 feet deep, was used until the 1920's. The aboriginal traditions relate that a giant kangaroo was speared, and his blood and body liquids soaked the ground and formed red, yellow and white ochre.

Despite the fact that Wilgie Mia was a reserve, European quarrying removed most of the stratified deposits and now little remains but the empty cave. Many feet of stratified deposit have been removed and only small deposits remain clinging to the walls. A Museum expedition investigated one of these deposits in 1962. The cave is now a Class C.Reserve (Reserve No. 16670).

State of Knowledge

There has been no systematic recording of sites in this area. Field workers in other disciplines have noted sites in passing and in particular, the work of Davies (1961) is of value.

THE SOUTH-WEST

Description of the Area

The area here termed South-West extends from Perth east to the Rabbit Proof fence and south along the fence to the sea.

The Art

The area is remarkable in being almost totally devoid of any art. Only 3 sites near Hyden fall within the area, and they contain only a few hand stencils. No rock engravings have been recorded.

Stone Arrangements

Stone arrangements are rare in the area, only 2 being recorded. One possible stone arrangement near Rockingham was dug up by a treasure seeker who believed that the 'GILT DRAGON' treasure was hidden beneath it.

State of Knowledge

The strange absence of art and other ceremonial sites is difficult to explain, but the absence does not seem to lie in the lack of field work. The South-West area is reasonably well known, and many field workers in other disciplines have worked in it, and they would have reported sites had they seen them. The explanation seems to lie in the culture of the aborigines of the South-West, a culture which we know was different from that existing elsewhere in the state.

THE EASTERN DIVISION

Description of the Area

The Eastern Division covers all of the remainder of the state, extending from the Great Australian Bight, to the Eastern border and to the Indian Ocean in the Eighty Mile Beach area. Included in the area are extensive desert areas.

The Art-Pictograph

The paintings are similar to those found in the Murchison area, that is, they consist principally of stencils, lines and animal tracks. Paintings of concentric circles and "horseshoe" designs are believed to represent the water holes and camps which mythical ancestors visited. There are a few records of snake paintings.

The Art-Petroglyphs

Rock engravings are rare, and represent the same motifs as the paintings. Animal tracks and circles are the most common motifs. Recently the Museum acquired an engraving of an elongated human figure from the Warburton Mission area. So far no record of this engraving has been recognised in the aboriginal legends and it is possible that there are two styles of engraving in the area. It is premature, however, to make any definite statement on styles at this stage.

Stone Arrangements

Stone arrangements are scattered throughout the Eastern Division, and appear to be of the same forms as those in the Murchison Area. A little more is known about the use of the stone arrangements in this area, for there are still many aborigines who have only recently come into Missions and towns.

State of Knowledge

Less is known about the art of the Eastern Division than in any of the other Divisions of the State. The area is a huge one, and, until the last few years, few tracks existed in it. Many of the reports of art sites are vague, amounting to little more than the recorded statement that paintings exist in certain ranges. Explorers have reported that art sites exist on the Canning Stock Route, but we do not know their locations. A great deal of work is needed in this area before we can talk of art styles with any certainty.

In this area, there are many natives who have only lived for a few years on Missions and in towns. It is still possible to take these people back into the area and record the sites and their legends. De Graaf, while Headmaster at the Warburton Mission School, recorded a number of sites and their legends in that area. Tonkinson has recorded a few sites east of Jigalong. It is an urgent matter that more of this kind of work should be done before the traditional knowledge has disappeared.

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CHAPTER 8

Historical Buildings in Western Australia

Although historic buildings would seem to be outside the scope of this report, their continued existence is an important part of Western Australian heritage and the Sub-committee believes that mention should be made of the problem of their conservation, and of the need for it. In order to do this, information about policy and activities in connection with the preservation of historic buildings was sought from the Royal Western Australian Historical Society, the National Trust of Australia (W.A.), and interested persons. Of the replies received, a comprehensive survey compiled by Mrs. Ray Oldham is noteworthy and the report owes much to it.

In evaluating historic buildings certain criteria are generally accepted as basic. These are:

(1) Their historical and cultural significance. This may be found in structures identified either with the lives of notable people or with important events in the development of the State. Significance of this kind may lie equally well in the work of a notable master builder, designer or architect, or in some simple building which is characteristic of the life of a section of the community, or of some period in time.

(2) Their suitability for preservation. Factors to be considered in assessing the suitability

of a building for preservation include accessibility to the public, encroachments by business, industry, housing and traffic, and availability of fire and police protection and essential utilities. As far as possible historic structures should support themselves, hence adaptation for a historic museum or other possible use must be considered. Finally, the building should have retained its integrity, which derives from original material and workmanship and original location.

(3) Their educational value. It is important that the structure preserved should be available for public use and enjoyment and be co-ordinated with similar projects in the State programme for the preservation of historic buildings to increase its usefulness as an educational force.

(4) The administrative and financial responsibility of the group which sponsors any building. Essential considerations are the legal authority of the sponsoring group, the soundness of their organization and the competence of the committee and staff to whom the building is to be entrusted. Evidence of ability to meet the cost of restoration and subsequent maintenance must be provided.

Although the criteria listed above are basic principles which must be considered, they cannot be regarded as hard and fast rules for the selection of significant buildings, as each building must also, to some extent, be evaluated in relation to its site.

In Western Australia historic buildings can be lost in three ways. In particular, some are demolished to enable their sites to be used for some other purpose; others are neglected until they are eventually reduced to rubble; and a third class are restored in a thoughtless and unsympathetic manner so that most of the features which make them significant are lost.

In accordance with the procedure followed in other sections of this report an attempt has been made to consider the preservation of historic buildings in this State in relation to the three questions:

What has been done in Western Australia,
What is being done in Western Australia,
What should be done in Western Australia,

to ensure the preservation of its historic buildings.

What has been done in Western Australia.

The Royal Western Australian Historical Society has done much to influence public opinion in the need for preservation of historic buildings and has worked constantly since its inauguration in 1926 to stimulate interest in all aspects of West Australian history; it has taken a leading part in every campaign to save important buildings. One of the first constructive moves was made by the Society at the time of the State's Centenary in 1929; then, historic buildings, both public and privately owned, were marked with memorial plaques. This, however, did not prove effective as a safeguard, many of these buildings having been subsequently demolished and the plaques destroyed without reference to the Society.

More recently, the National Trust of Australia (W.A.) was formed in 1959 with the specific object of preserving historic buildings and sites. It is hoped that legislation to assist the Trust in its work will be introduced in the 1964 Session of the W.A. Parliament.

As a result of intervention by the Royal Western Australian Historical Society and the National Trust and of pressure of public opinion, a certain number of the State's important buildings threatened with demolition have been saved. Notable among these are:

The Round House, Fremantle (1831)[1], the State's oldest public building, continued neglect of which led to suggestions for demolition.

The Old Court House (1836) now the Arbitration Court, which was threatened by plans for a ceremonial drive.

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[1]Dates of erection shown in brackets in this and subsequent lists can only be given approximately in some cases; where buildings have had later additions, the date is of the erection of the first portion.

The Old Mill, South Perth (1835), which would have been destroyed if the original plan for the approaches to the Narrows Bridge across the Swan River had been carried out. It is now an historical showpiece, having been restored by Brisbane & Wunderlich Ltd.

The Perth Town Hall (1870), first threatened in 1924, and more recently in connection with plans for the widening of Hay Street.

Toodyay Old Gaol (1860's), which would have soon disintegrated from continued neglect, but has been restored by the Toodyay Shire Council and the Tourist Development Authority for use as an historical museum.

Strawberry Hill Farm, Albany (1836), which was bought by the Government to save it from demolition when sub-division of the property was suggested, and vested in the Albany Town Council on the condition that it restored and maintained the building.

The Deanery, Perth (Ca.1860). Demolition was proposed by the Church so that the site could be used for offices. Public protest was so strong that Synod agreed to the retention of the building.

Preservation of the first five buildings listed above now seems assured. Strawberry Hill Farm is still in danger; owing to the failure of the Albany Town Council to fulfil its obligations the building is rapidly approaching the stage when it will be beyond repair. There is no guarantee that the Deanery will not again be threatened by proposals to develop a site which could be a valuable source of income to the Church.

Buildings which have already disappeared are too numerous to mention individually. By no means all of them would have been preserved even if this had been possible, but it is to be regretted that records of them were not made before it was too late. This particularly applies to many of the old homes in Adelaide Terrace and other parts of the city of Perth which have been replaced by offices and blocks of flats.

The following are some of the better known buildings which have been lost in comparatively recent years. First of all in Perth:

The Old Military Hospital (1860's) opposite the Pensioners' Barracks on the corner of St. George's Terrace and St. George's Place, demolished when the Church of Christ Scientist was built in 1938.

The Department of Industrial Development Building (1880's) in Barrack Street, between the Town Hall and Treasury Buildings, demolished in 1959 before the erection of the new Rural and Industries Bank.

The Old Legislative Council Building (1837) in St. George's Terrace, more recently used by the Department of Agriculture, demolished to clear the site for the new Town Hall in 1961.

The Old Perth Girls' School (1854) known in more recent times as the "Turkish Baths" in Pier Street, demolished when the site for the car park was cleared adjacent to the Playhouse Theatre about 1956.

The Clergy Lodgings (Ca.1860) sometimes known as "Bishop's Cottage", adjoining Bishop's House in St. George's Terrace, demolished in 1959 so that the site could be used for other purposes.

The Mount House (1851) in Mount Street, demolished in 1960 to allow development of the area for the Emu Brewery.

On Rottnest Island:

The Old Salt Works (1869) demolished about 1957 when it was considered the structure had become dangerous.

In the country:

The Old Court House (1863) in Geraldton, demolished in 1958 because finance for maintenance was not forthcoming and the site was valuable.

The Octagon Church (1835) at Albany and the Gwalla Church (1864) at Northampton. These non-denominational Churches eventually fell down from neglect

(the Gwalla Church in the 1930's and the Octagon Church somewhat earlier) as no one took responsibility for their maintenance.

Very little has been written about the State's old buildings and records of them are far from complete. A certain number of plans and specifications for Government buildings do exist — some already preserved in the State Archives in the J.S. Battye Library of West Australian History, others still retained in the Public Works Department. It is not always possible, with private buildings, to establish the exact date of erection, or discover who was the builder. However, from material (including old pictures and photographs) in the Battye Library, if time can be given to the necessary research, a short historical note can usually be compiled.

Since 1947, students of the Department of Architecture, Perth Technical College, have been required during their course to submit measured drawings of historic buildings, and a selection of these drawings has been retained in the Department. Photographic copies are available for reference in the Battye Library.

A collection of comparatively recent paintings of historic buildings of the South West by Leith Angelo, exhibited in Perth in 1950, constitute a useful record for the district around Bunbury and Busselton. These paintings have been presented to Parliament House.

There is some published material available on the historical buildings of Western Australia. The more important of this is:

"Buildings and Builders" — Chapter XXXVI of "The Story of a Hundred Years", ed. by Sir Hal Colebatch. Perth. 1929.

A small folder containing photographs and brief historical notes, with the title "Historical Places of Western Australia" by Mr. H. G. Clifton, which appeared in 1932.

A series of 52 drawings by Mr. D. L. Cummings, with brief notes attached, published under the title "Historic Homesteads" weekly in "The Western Mail" for a year, from March 1939 to March 1940.

"Pointers to the Past" by Jean Bull — an illustrated article in "Walkabout" July 1958.

"The Three Periods of Western Australian Colonial Architecture", by John and Ray Oldham, an article in the Journal and Proceedings of the Western Australian Historical Society, Vol. V, Part VI, 1960.

"Western Landmarks" — a booklet containing historical notes by R. P. Wright and drawings by H. Smeed of 31 buildings. Perth. 1960.

"The Countryman" at irregular intervals during 1961, featured pictures of historic buildings on the cover, with a short note about them.

"Western Heritage" — A Study of the Colonial Architecture of Perth, Western Australia, by Ray and John Oldham. Perth. 1961.

What is being done in Western Australia.

The Royal Western Australian Historical Society has continued in its activities to draw attention to the need for conserving old buildings and, as an example of its work, has recently been responsible for the formation of the Barracks Defence Council (representative of a number of societies and individuals) in order to try to save the Old Pensioners' Barracks which stands at the head of St. George's Terrace and is threatened by the development of the approaches to the Houses of Parliament. In co-operation with the National Trust a brochure setting out arguments for the preservation of the Barracks was published and distributed.

The work of the National Trust in connection with historic buildings has been developing along various lines. In particular attention has been given to the drafting of suitable legislation to assist the Trust in furtherance of its aims, and Government support for this legislation has been obtained. The listing and classification of historic buildings throughout the State has begun; to date, some two hundred and fifty buildings have been listed and approximately thirty classified. Finally, definite efforts are being made at present for the preservation of a select number of buildings which are known to be threatened by development schemes in the immediate

future. These are:

The Barracks (1866).

The Old Perth Boys' School (1854).

The Old Women's Home, Fremantle (Ca.1855).

Old St. Paul's Cathedral, Bunbury (1866).

Prospect Villa, Busselton (Ca.1860).

Old Settlement Buildings, Rottnest Island. [Most buildings erected between 1842 and 1865; Boys' Reformatory (Hostel) and old Church, 1880-1881].

In addition, an attempt is being made to safeguard certain disused buildings privately owned, which could disintegrate from neglect, and to collect before it is too late, records of other structures which are of historical interest, though not necessarily worthy of preservation.

What should be done in Western Australia.

Four things are basic to a programme for the preservation of important historic buildings in Western Australia.

1. A decision must be made as to which buildings should be preserved and priorities assigned to these.

2. Finance for restoration and maintenance of the buildings must be found.

3. Appropriate legislation to secure and to assist the work of the responsible authority should be introduced.

4. Continual efforts must be made to arouse interest and pride in the State's achievements, and to create amongst the general public a feeling for tradition and, in particular, the appreciation of its historic buildings.

The National Trust is working towards all four of these objectives.

A comprehensive survey of historic buildings is difficult to carry out in a State as large as Western Australia; in order to complete the register of buildings which are worthy of consideration and to obtain information about them, the National Trust has sought the co-operation of shire and town councils and community organizations throughout the State. They have been sent circular letters explaining the Trust's objectives and enclosing forms to be returned to the Trust after details about buildings in their area have been supplied. Buildings on the register will then be classified according to their significance as

those which must be preserved;
those which are of sufficient interest to be preserved if possible and in any event to be fully recorded;
those which do not merit any action.

The preservation of even our most significant buildings will not be easy to achieve. The National Trust, which it is hoped will soon have statutory authority, is clearly the body through which to work for this end. Every effort should be made, not only to strengthen the Trust itself by increasing its membership, but to give the widest possible publicity to its aims and to the buildings which it classifies as worthy of retention.

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LEGEND

1	Nornalup
2	Porongorups
3	Stirling Range
4	Margaret River - Hamelin Bay
5	Ludlow State Forest (Sth Ptn)
6	Mandurah
7	Pingelly and Dryandra
8	Serpentine Area
9	John Forrest National Park
10	Yanchep Park
11	Lake Magenta
12	Fitzgerald River
13	Toodyay, State Forest
14	Murchison River
15	Mt Lesueur
16	Houtman Abrolhos
17	Rottnest Island
18	Garden Island
19	Bald Island
20	Achipelago of the Recherche
21	Cape Le Grand
22	Cape Arid
23	Twilight Cove
24	Bremer Range
25	Lake Barker
26	North Nullarbor
27	Mount Manning Range
28	Lake Disappointment
29	Queen Victoria Springs
30	Barlee Range
31	Hamersley Range
32	Dampier Archipelago
33	Barrow Island
34	Bernier and Dorre Islands
35	(Dampier Land)
36	Prince Regent River
37	Drysdale River
38	Napier - Oscar Ranges Area
39	Bugle Gap
40	Wolf Creek Meteorite Crater
41	Prices Creek
42	Mt Wynne
43	Mt Hardman
44	Brutens Yard
45	Carawine Gorge
46	Minilya River
47	Wandagee Hill
48	Muderong Bore Area
49	Williambury Station
50	Merlinleigh Station
51	Moogooree Station
52	Wooramel River
53	Bindoo Spring
54	Wooderarrung Creek
55	Bringo District
56	Irwin River
57	Coomberdale
58	Toodyay
59	Quairading
60	Coolgardie
61	Kalgoorlie

⊙ ..... Denotes Existing Reserves

★ ..... Denotes Proposed Reserves

★ ..... Denotes Proposed Geological Reserves

(Symbols represent position not area)

INDIAN

114° 116° 118° 120°

14° 16° 18° 20° 22° 24°

BREAKER INLET Larrey Pt Poissonier Pt Cape Keraudren Eighty Mile Beach Wallal Downs Mandora

Pardoo De Grey RIDLEY R. DE GREY R. Shaw River Strelley R. Mt Grant Mulvie Mt Goldsworthy Ettrick Nimingarra Warralong Muccan Yarrie Callawa Coongan

Cape Thouin PORT HEDLAND Cape Cossigny Mundabullangana Boodarie Pippingarra Strelley Carlindi Tabba Tabba Wallareenya Portree Mt Berghaus Indee Lalla Rookh West Strelley River East Strelley River Eginbah Bamboo Talga Talga Warrawagine Isabella Ra Gregory Range

Depuch I Legendre I Dolphin I Rosemary I Enderby West Lewis I East Lewis I Dixon I Nickol Bay Cape Lambert POINT SAMSON PORT WALCOTT ROEBOURNE Cossack Mt Welcome Whim Creek Mallina Sherlock R. Warambie Pyramid Mt Wellard (777) Croydon Kangan Limestone Mt Edgar Meentheena Braeside Talga R. Nullagine R.

Dampier Archipelago North West I Trimouille I Montebello Is Hermite I Cape Dubuy Cape Malouet FLAGCOURT BAY Double I Barrow I Latitude Pt Cape Poivre Cape Preston REGNARD BAY Karratha Mt Leopold Chirratta Woodbrook Cooya Pooya Balmoral Mt Virchow Mardie Daniels Well Mt Herbert (1228) Mt Wohler (1005) Mt Montagu (1050) Mt Leal Mt Richthofen (1210) Portland Harding R. Herbert R. Yule R. Turner R. Sherlock R. Balla Balla R. Yandeyarra Abydos Pilga Marble Bar Corunna Downs Hillside Woodstock White Springs Shaw River

Mary Ann Pt Beadon Pt Onslow Cane River Warramboo Yarraloola Deepdale Robe River Millstream Fortescue River Yalleen Mt Billroth Coolawanyah Mt Florance Mungaroona Range Hooley Chichester Range Mulga Downs Bamboo Springs Riverdale Nullagine Line Bonney Downs Noreena Downs Mt McLarty Mt Divide Mt McKay Mt Cooke Warrie Roy Hill Mt Lewin Marillana Balfour Downs Talawana

North Murion I South Murion I North West Cape Vlaming Head False Island Pt Low Pt Tubridgi Pt Glenroy Yardie Creek Exmouth Gulf EXMOUTH GULF Bay of Rest Learmonth Rough Range Point Cloates Whaling Station Pt Cloates Ningaloo Bullara Giralia Peedamulla Peedamullah Hill Cane River Mt Minnie Red Hill Minderoo Mt Enid (962) Mt Dempster (1219) Mt Elvire (2207) Mt Flora (2010) Mt Pyrton (2727) Mt Rica (1817) Mt Margaret (2798) Hamersley Range Dividing Range Mt Minnie Red Hill

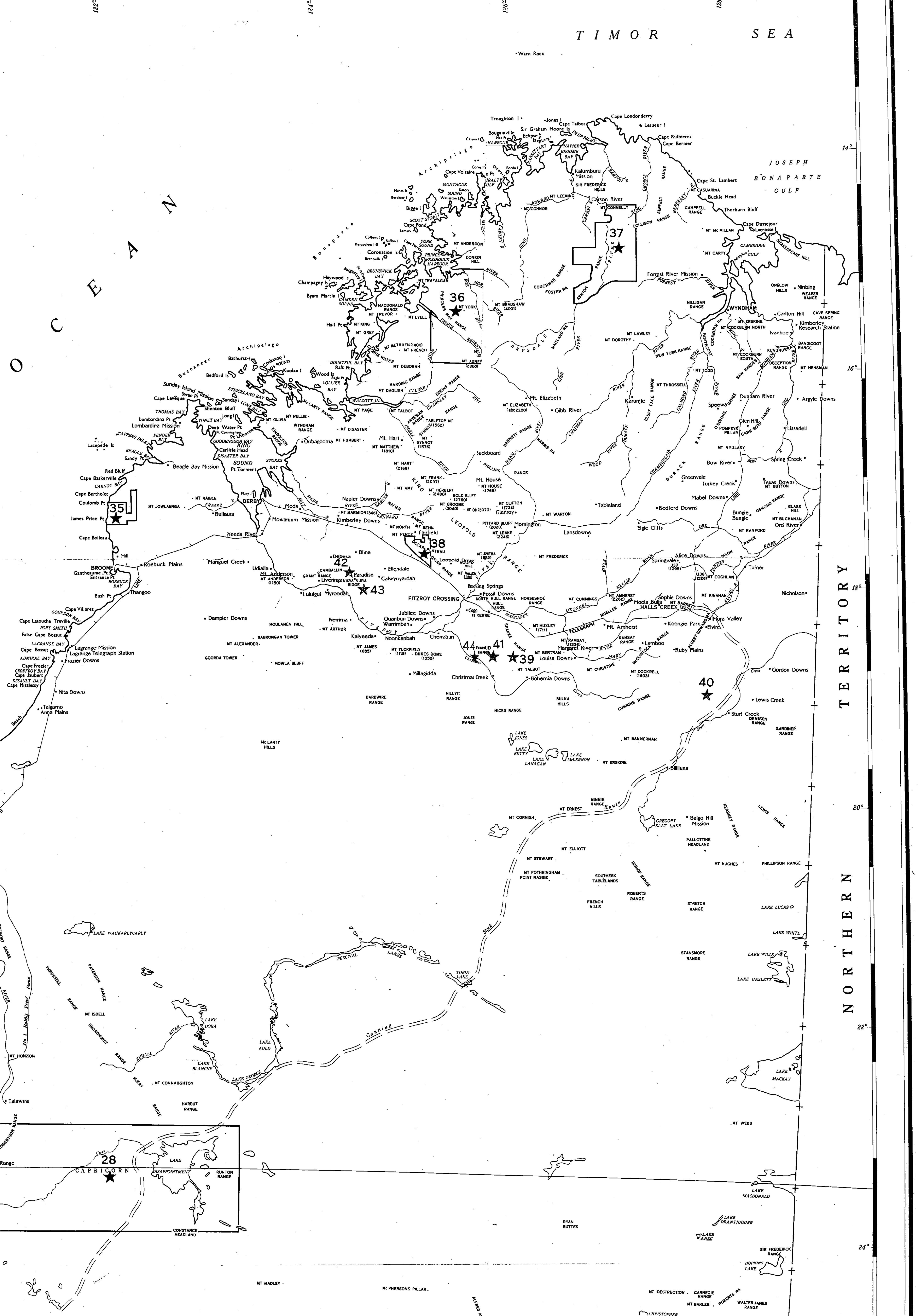
The Range Koordarrie Mt Amy (1194) Mt Stuart (1033) Mt Murray Nanutarra Urandy Y8 (2340) Y10 (3254) Mt Farquhar Y13 (3250) Mt Brockman Hamersley Mt McRae (3326) Mt King (3336) Wittenoom Gorge Mt Brockman (3654) Mt Vigors (3756) Mt Bruce (4024) Duck Creek Parry Range Yanrey Yannarie River Boolaloo Mt Edith Wyloo Mt Alexander Mt Elizabeth Mt Clement Meilga Mt Danvers Mt De Courcey Mt Wall Mt Turner (3272) Mt Samson (3540) Juna Downs Rocklea Mt Jope Mt Bennett Henry R. Ashburton River Uaroo Glen Florrie Kooline Mt Florry Ullawarra Hardey River Poonda Ethel Creek Billinooka Walgun

Marrilla Wogoola Towera Winning Cardabia Pt Maud Pt Anderson Scrubby Range Mia Mia Lyndon River Warroora Maroonah Ullawarra Range Mt Palgrave (2311) Capricorn Range Ashburton Downs B10 (1640) Pirraburdu Ophthalmia Range Mt Newman Tropic of Capricorn Murramunda Jiggalong Mission Robertson Range Robertson Range

Cape Farquhar Gnaraloo Moogooloo Hill Lyndon Y2 (1368) Edmund Wanna Kenneth Range Godfrey Range Glenidle Turee Creek Prairie Downs Sylvania Mundiwindi Weelarrana Bulloo Downs Savory

Minilya Wandagee Middalya Wandagee Hill Mangaroon Williambury River Mt Thonson (1287) Gifford Creek Minnie Creek Cobra Moogooree Manberry Lake Mt Bresnahan (2240) Mt Vernon (1916) Mt Vernon Dooley Downs Lofty Range

46 47 48 49 51



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Bougainville
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Cassini I
Eclipse Is
Long I
DEEP BIGHT
VANSITTART BAY
NAPIER BROOME BAY
Cape Rulhieres
Cape Bernier
JOSEPH BONAPARTE GULF
Archipelago
Bonaparte
Cape Voltaire
Corneille
Osborne I
Borda I
ADMIRALTY GULF
MONTAGUE SOUND
Katers I
Wallaston I
Maret Is
Berthier I
Bigge I
SCOTT STRAIT
Cape Pond
Lamark I
Colbert I
Buffon I
Keraudren I
Cape Torrens
YORK SOUND
Coronation Is
Bernoulli I
PRINCE FREDERICK HARBOUR
MT ANDERDON
DONKIN HILL
Augustus I
Pt Adieu
BRUNSWICK BAY
Heywood Is
Champagny Is
MT TRAFALGAR
Byam Martin I
CAMDEN SOUND
MACDONALD RANGE
MT TREVOR
MT LYELL
36
MT YORK
PRINCESS MAY RANGE
PRINCE REGENT
ROE
MORGAN
RIVER
Hall Pt
MT KING
MT GREY
MT METHUEN (1400)
MT FRENCH
GEORGE WATER
DOUBTFUL BAY
Raft Pt
MT DEBORAH
MT AGNES (2300)
Kalumburu Mission
SIR FREDERICK HILLS
BARTON R
Carson River
MT LEEMING
EDWARD
MT CONNOR
CARSON R
MT CONNELLY
KING
MITCHELL
LAWLEY R
GEORGE RIVER
RANGE
SEPPELT
COLLISON RANGE
BERKELEY
Cape St. Lambert
MT CASUARINA
Buckle Head
CAMPBELL RANGE
Thurburn Bluff
Cape Dussejour
Lacrosse I
MT Mc MILLAN
37
RANGE
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ASHTON
COUCHMAN RANGE
FOSTER RA
MT BRADSHAW (4001)
CAMBRIDGE GULF
Adolphus I
SHAKESPEARE HILL
MT CARTY
Forrest River Mission
FORREST
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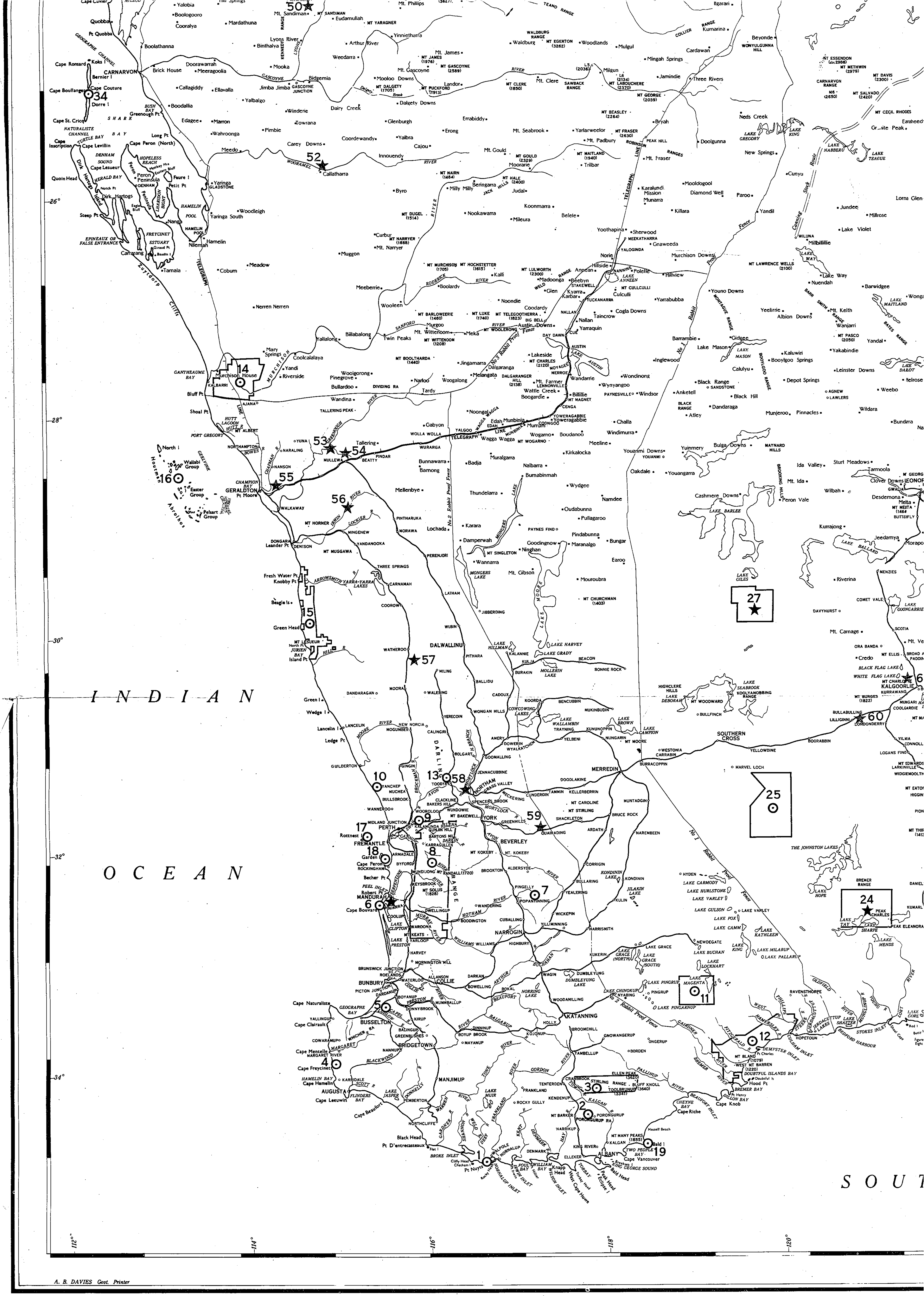
ONSLOW HILLS
Ninbing
WEABER RANGE
MILLIGAN RANGE
WYNDHAM
Carlton Hill
CAVE SPRING RANGE
Kimberley Research Station
MT ERSKINE
MT COCKBURN NORTH
Ivanhoe
MT COCKBURN SOUTH
KUNUNURRA
BANDICOOT RANGE
DECEPTION RANGE
MT HENSMAN
SAW RANGES
DUNHAM R
PENTECOST
COCKBURN RA
DRYSDALE
MAITLAND RA
MT LAWLEY
MT DOROTHY
NEW YORK RANGE
MT TODD
GIBB
MT THROSSELL
Karunjie
BLUFF FACE RANGE
SALMOND
Dunham River
Argyle Downs
Speewa
O DONNEL
Glen Hill
CARR BOYD RANGE
POMPEYS PILLAR
Lissadell
MT NYULASY
Bow River
BOW
Spring Creek
ORD
Texas Downs
MT BUTTON
Greenvale
Turkey Creek
DURACK RANGE
CHAMBERLAIN
Mabel Downs
LINE
OSMOND RANGE
GLASS HILL
Bungle Bungle
MT BUCHANAN
Ord River
MT RANFORD
Elgie Cliffs
Bedford Downs
Tableland
Mt. Elizabeth
MT ELIZABETH (abt 2200)
Gibb River
CHAPMAN
DURACK
WOOD
BARNETT RANGE
HARRIS RA
HANN
Buckboard
PHILLIPS RANGE
Mt. House
MT HOUSE (1769)
Archipelago
Buccaneer
Bathurst I
Cockatoo I
YAMPI SOUND
Koolan I
Bedford Is
Wood Is
Eagle Pt
COLLIER BAY
HARDING RANGE
MT DAGLISH
CALDER
EDKINS RANGE
CHARNLEY
WALCOTT IN
Sunday Island Mission
Swan Pt
Cape Levêque
STRICKLAND BAY
Sunday I
CONE BAY
Shenton Bluff
McLARTY RANGE
MT PAGE
MT TALBOT
ARTESIAN RANGE
TABLETOP MT
SYNNOT (1562)
THOMAS BAY
Lombardina Pt
Lombardina Mission
CYGNET BAY
Long I
Deep Water Pt
Pt Cunningham
Pt Usborne
MT OLIVIA
MT NELLIE
WYNDHAM RANGE
MT DISASTER
ISDELL
TAPPERS INLET
PENDER BAY
GOODENOUGH BAY
KING
KIMBOLTON RANGE
Oobagooma
MT HUMBERT
Mt. Hart
MT MATTHEW (1810)
MT SYNNOT (1576)
Lacepede Is
BEAGLE BAY
Sandy Pt
Carlisle Head
DISASTER BAY
SOUND
STOKES BAY
Beagle Bay Mission
Pt Torment
MT HART (2168)
RIVER
Red Bluff
Cape Baskerville
CARNOT BAY
Cape Bertholet
Coulomb Pt
35
James Price Pt
MT FRANK (2097)
MT AMY
MT HERBERT (2480)
BOLD BLUFF (2760)
MT BROOME (3040)
MT OO (3070)
MT CLIFTON (1734)
Glenroy
MT WARTON
MT RAIBLE
MT JOWLAENGA
FRASER R
Bullaura
Mary I
DERBY
Meda
MEDA
MAY R
Napier Downs
BARKER
NAPIER
RIVER
MT MARMION (346)
LENNARD
Mowanjum Mission
Kimberley Downs
RANGE
LEOPOLD
PITTARD BLUFF (2028)
Mornington
MT LEAKE (2246)
Lansdowne
MT NORTH
MT BEHN
MT PERCY
Fairfield
38
OSCAR PLATEAU
Cape Boileau
Yeeda River
Hill
Manguel Creek
Debesa
Blina
42
CAMBALLIN
Paradise
Ellendale
BROOME
Gantheaume Pt
Entrance Pt
ROEBUCK BAY
Roebuck Plains
Udialla
Mt. Anderson
MT ANDERSON (1150)
GRANT RANGE
Liveringa
NURA NURA RIDGE
Calwynyardah
43
MT SHEBA (805)
HOOPE HILL
MT WILSON (820)
Leopold Downs
OSCAR RANGE
MT FREDERICK
RIVER
Bush Pt
Thangoo
LINE
Luluigui
Myroodah
FITZROY CROSSING
Brooking Springs
Fossil Downs
NORTH HULL RANGE
HULL RANGE
HORSESHOE RANGE
Gogo
MT PIERRE
MARGARET
MT CUMMINGS
O'DONNELL
MT AMHERST (2260)
NELLIE
RIVER
Springvale
J37 (1295)
Alice Downs
DIXON
PANTON
J36 (1326)
MT COGHLAN
Turner
Sophie Downs
Moola Bulla
MT BARRETT (2225)
HALLS CREEK
MT KINAHAN
ELVIRE R
Nicholson
Cape Villaret
GOURDON BAY
Cape Latouche Treville
PORT SMITH
False Cape Bossut
LAGRANGE BAY
Cape Bossut
Lagrange Mission
Lagrange Telegraph Station
ADMIRAL BAY
Frazier Downs
Cape Frezier
GEOFFROY BAY
Cape Jaubert
DESAULT BAY
Cape Missiessy
Dampier Downs
MOULAMEN HILL
Nerrima
MT ARTHUR
Jubilee Downs
Quanbun Downs
Warrimbah
FITZROY
BABRONGAN TOWER
MT ALEXANDER
Kalyeeda
Noonkanbah
Cherrabun
GOORDA TOWER
MOWLA BLUFF
MT JAMES (685)
MT TUCKFIELD (1119)
DUKES DOME (1055)
44
EMANUEL RANGE
41
39
SPARKE RANGE
MT HUXLEY (1711)
TELEGRAPH
MUELLER RANGE
Mt. Amherst
Koongie Park
Flora Valley
Elvire
ALBERT EDWARD RA
MT RAMSAY (1336)
RAMSAY RANGE
Lamboo
Margaret River
RIVER
MT BERTRAM
Louisa Downs
MARY
McCLINTOCK RANGE
Ruby Plains
MT TALBOT
MT CHRISTINE
MT DOCKRELL (1603)
Christmas Creek
Bohemia Downs
Millagidda
Creek
Gordon Downs
40
Nita Downs
BARBWIRE RANGE
MILLYIT RANGE
BULKA HILLS
CUMMINS RANGE
Lewis Creek
Talgarno
Anna Plains
Beach
HICKS RANGE
JONES RANGE
Sturt Creek
DENISON RANGE
Sturt
GARDINER RANGE
McLARTY HILLS
LAKE JONES
LAKE BETTY
LAKE LANAGAN
LAKE McLERNON
MT BANNERMAN
MT ERSKINE
Billiluna
TERRITORY
MINNIE RANGE
Route
MT ERNEST
MT CORNISH
GREGORY SALT LAKE
Balgo Hill Mission
KEARNEY RANGE
LEWIS RANGE
PALLOTTINE HEADLAND
MT ELLIOTT
MT STEWART
MT FOTHRINGHAM
POINT MASSIE
SOUTHESK TABLELANDS
BISHOP RANGE
ROBERTS RANGE
FRENCH HILLS
STRETCH RANGE
MT HUGHES
PHILLIPSON RANGE
LAKE LUCAS
LAKE WHITE
NORTHERN
LAKE WAUKARLYCARLY
GREGORY RANGE
RIVER
No 1 Rabbit Proof Fence
THROSSELL RANGE
PATERSON RANGE
MT ISDELL
BROADHURST RANGE
PERCIVAL LAKES
Stock
TOBIN LAKE
STANSMORE RANGE
LAKE WILLS
LAKE HAZLETT
LAKE DORA
RIVER
RUDALL
LAKE AULD
Canning
MT HODGSON
LAKE BLANCHE
LAKE GEORGE
McKAY RANGE
MT CONNAUGHTON
LAKE MACKAY
Talawana
HARBUT RANGE
ROBERTSON RANGE
MT WEBB
Creek
28
Range
CAPRICORN
LAKE DISAPPOINTMENT
RUNTON RANGE
LAKE MACDONALD
CONSTANCE HEADLAND
RYAN BUTTES
LAKE ORANTJUGURR
LAKE ANEC
SIR FREDERICK RANGE
HOPKINS LAKE
MT MADLEY
McPHERSONS PILLAR
ALFRED
MT DESTRUCTION
CARNEGIE RANGE
ROBERTS RA
MT BARLEE
WALTER JAMES RANGE
CHRISTOPHER



A. B. DAVIES Govt. Printer

MAP OF WESTERN AUSTRALIA

Scale : 1 Inch to 50 Miles

Miles 50 40 30 20 10 0 50 100 150 Miles

Projection : Modified Polyconic

Prepared by the Mapping Branch, Surveyor General's Division, Department of Lands and Surveys, Perth, Western Australia.