

WEST. AUST. NAT. RESERVE MANAGE. PLAN SUPPLEMENT No. 2 (DRAFT)

A SIGNS STANDARD FOR USE IN THE MANAGEMENT OF NATURE RESERVES IN WESTERN AUSTRALIA

by

IAN G. CROOK

DEPARTMENT OF FISHERIES AND WILDLIFE 1983



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A SIGNS STANDARD FOR USE IN THE MANAGEMENT OF NATURE RESERVES IN WESTERN AUSTRALIA

1. INTRODUCTION

Signs are frequently the first, and sometimes the only form of communication the Department of Fisheries and Wildlife has with members of the public visiting nature reserves. To be effective signs need to be regarded both as a medium for transmitting information and as a means of facilitating a positive response from the visitor to the message received. Signs should further reflect the approach of the Department to management and project a consistent image of the nature reserve concept to the observer.

There has been considerable development in recent years in the management of interactions between people and nature reserves in Western Australia. With respect to their public use the approach of the Authority remains a conservative one. Active management of public use falls into one of three categories:

1. **Reactive:** Involving guidance of existing or developing use patterns where these can be seen not to conflict with the primary purpose and management objectives of the reserve. A handful only of the more than 1 000 nature reserves in the State are subject to an appreciable level of public use of this kind. Where it is evident, however, steps are taken to try to ensure that it remains in harmony with the natural environment (e.g. Fig. 1).
2. **Restrictive:** In which the development of use patterns of uncertain or undesirable effect is inhibited. The provisions of Section 12A (Classification of reserves to restrict certain kinds of use) and Regulations 42 to 48 of the Wildlife Conservation Act and Regulations (Appendix I) give the Authority far reaching powers in this respect.
3. **Promotive:** Confined to promotion of the "...study of the natural environment ..." and to the "...promotion of the study of flora and fauna ...". Frequently taken as inferring promotion of formal, original research these provisions may be interpreted as a responsibility to manage nature reserves in ways which encourage environmental awareness among a broader cross-section of the public. These are the only objects of management in facilitation of public use specified by the Act (Section 12D(2) - Appendix I). (The same Section provides, in addition for: "...Such other objects (of management) relating to conservation and protection of flora and fauna as the Authority recommends and the Minister approves ...". This provision could facilitate forms of public use other than those of interpretation and research but does not need to be invoked for the purpose of this standard.)



Figure 1. Thomsons Lake Nature Reserve (above) Two Peoples Bay Nature Reserve (below). Public use of nature reserves in Western Australia is not directly encouraged. Where it does occur management is directed toward the achievement of harmonious interactions between people and the natural environment.

By virtue of their management objectives nature reserves are unique among Crown lands in Western Australia. The legislation upon which management is based and the works that have proceeded from it are as sound as the nature reserve system itself. They are rightly sources of some pride to the Department. It is therefore appropriate that the Department's communications with the public should reflect the unique features of the reserve system and seek to engender a similar pride and respect among the public at large.

This paper introduces the signs standard approved by the Western Australian Wildlife Authority for use on nature reserves in Western Australia. The standard is based on machine-routed wooden signs of modular construction adapted from the Signs System Specifications of the U.S. National Parks Service and standards employed by National Parks and Wildlife conservation authorities in other States of Australia, e.g. N.S.W. National Parks and Wildlife Service (1971), Department of Environment and Planning, South Australia (1981), Victoria National Parks Service (1981). The standard has been in use on a trial basis on five nature reserves for the past one to two years. This paper discusses the technical basis of the standard and describes the specifications of signs conforming to the standard and results of its trial use.

2. THE EXISTING SIGNS PROGRAMME

Signs currently in general use on nature reserves (Fig. 2) have served their purposes well, that is:

- to identify sites as "nature reserves"* in the meaning of the Wildlife Conservation Act;
- to inform the public of some of their responsibilities in respect of nature reserves; and
- to facilitate enforcement of provisions of the Wildlife Conservation Act and Regulations.

The emphasis of the existing programme has generally been on providing information about the legal status of sites which could be used in evidence to support prosecution of

*In 1976 the Wildlife Conservation Act was amended to replace the term "Wildlife Sanctuary" with "Nature Reserve", an amendment which was coincidental with the inclusion of provisions for conservation of flora and fauna in the one Act.

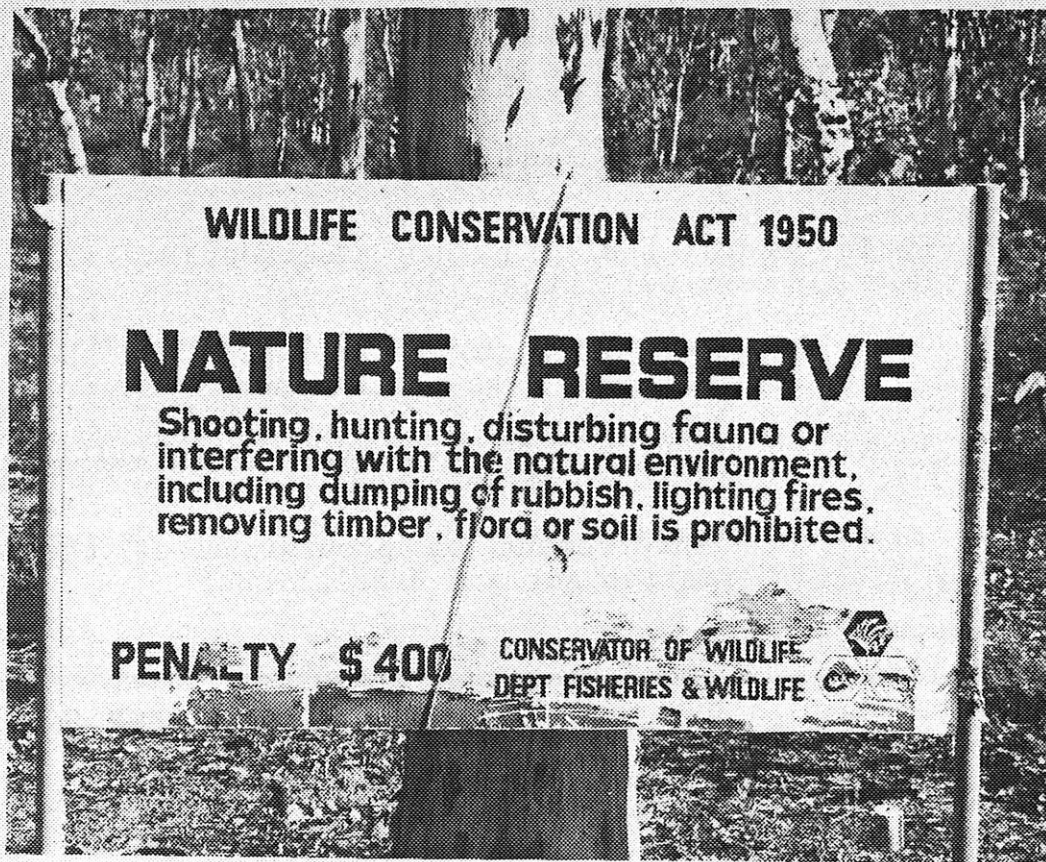
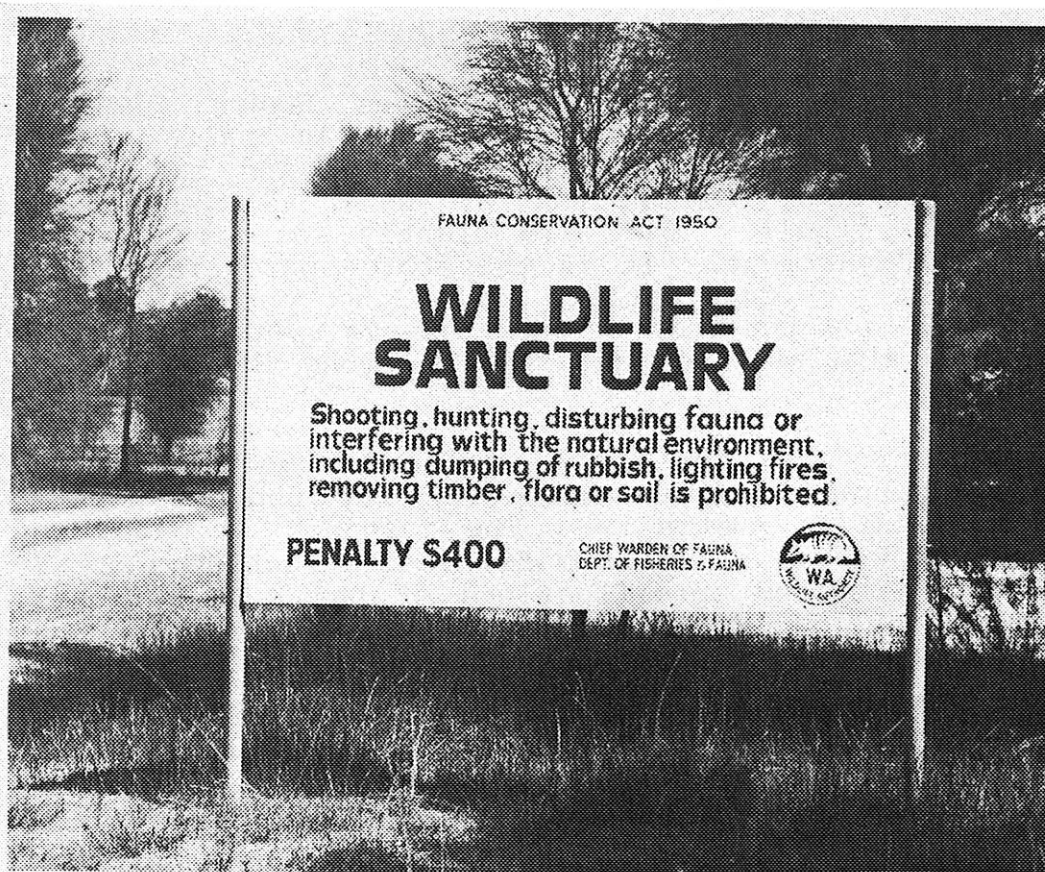


Figure 2. Examples of "nature reserve" signs in current use in Western Australia. Obsolescence and various levels of damage are frequent.

infringements of the Act and Regulations.

The review of the signs standard, accompanied as it has been by a reassessment and broadening of purposes for which signs are erected, has come at a time when many existing signs are nearing the ends of their useful lives, have become obsolete (e.g. Fig. 2) and are in damaged condition. Being silk-screen or hand-printed on metal these signs have become increasingly costly to replace. They are easily damaged but difficult to repair. They are also difficult to erect and are prone to vandalism. Unfortunately, once they are defaced, signs of this kind tend to invite further damage.

3. RATIONALE FOR STANDARDISATION OF SIGN-POSTING

Economic considerations

Having concern for management of more than one thousand sites, the potential economic advantages of standardisation of sign-posting are particularly apparent for the Western Australian system of nature reserves. The standardisation of materials and design, combined with a modular design system (Fig. 3), minimise costs of materials and administration associated with acquisition and manufacture. Similar benefits accrue in lowered costs of maintenance and simplification of documentation of layout of signs on reserves.

Standardisation and Communication Effectiveness

Continuity of design can facilitate the communication process. In the case of the nature reserve application it permits immediate visual distinction of sites and differentiates them (and by implication, their management) from lands of other tenures and purposes. Continuity of design provides visual and verbal cues linking individual sites, suggesting them to be parts of a system of nature reserves. Assuming the standard and signs themselves are well designed, continuity further assists visitors to understand messages and conform to special rules of behaviour in relation to nature reserves generally. Finally, extending these separate considerations to a common focus, continuity, linked with good design, helps advance the nature reserve concept in the public mind.

Standardisation vs. Uniformity

There are potential pitfalls as well as advantages in standardisation of signs design. The principal one is the risk of boredom, caused by a dull sameness in signs, giving rise to a negative reaction among the public to the reserve system as a whole (Allwood 1978). The least effect of boring signage is to render an observer refractory to it as a communication medium. In consideration of this and the great diversity of sites within the nature reserve system, which lend themselves to varying approaches to sign-posting,

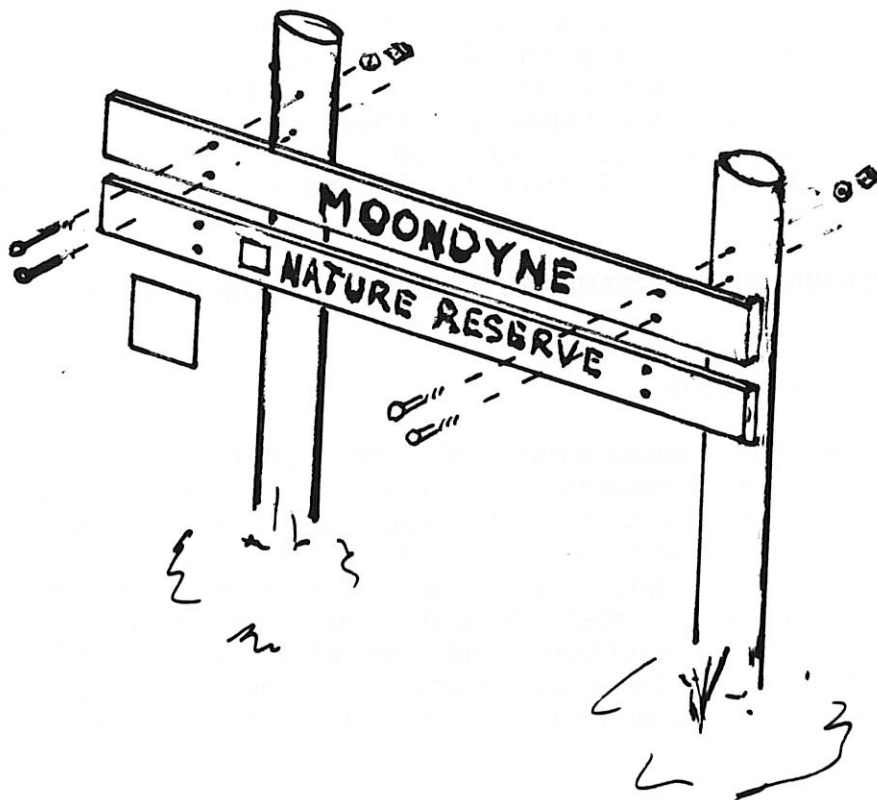


Figure 3. Signs conforming to the new standard are of modular construction. Nature reserve signs themselves, for example, generally vary from one another only in the lettering of the "name board". Standardisation permits economics of scale in batch construction of sign components.

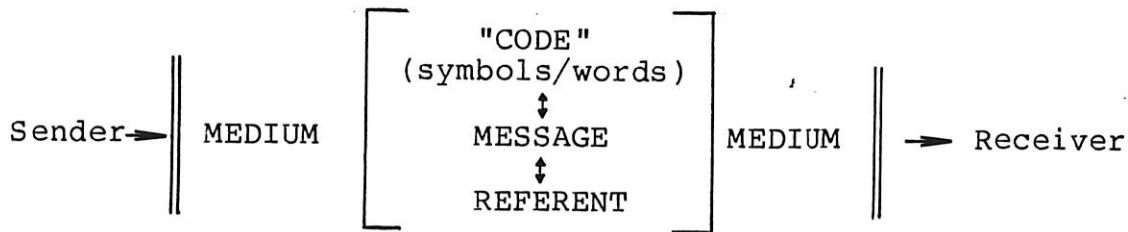
the emphasis of this standard is on recognisable continuity rather than total uniformity from place to place.

Further, the signs standard embraces the idea that a degree of variation is needed to ensure maximum harmony between signs, environments and management objectives across the diverse range of the reserves concerned.

4. PRINCIPLES OF SIGNS DESIGN AND THE COMMUNICATION PROCESS

For the purpose of this standard signs have been defined as a means of communicating ideas and (generally) short messages to people present at or passing a particular site.

The communication process, as it applies to signs, can be described graphically, as follows:



Communication by signs is a one way process, there being no possibility of feedback. The medium is the sign itself, the breaks between sender, medium and receiver indicating room for individual perception. As with all types of communication, the potential exists for a sign to be perceived in quite different lights by receivers than it was by the sender.

In the process of scanning or reading a sign the referent of a coded message (for example "Thomsons Lake Nature Reserve") is decoded by the reader. The decoding is a subjective, cerebral affair, individual to each "receiver", conditioned by preconceptions and greatly influenced by aesthetic factors such as design and placement as well as questions of content of the sign and, impressions of the environment in which it is placed. The words "nature reserve" are associated by the observer with the name "Thomsons Lake", with his own appreciation of the nature reserve idea and finally with the reality of the reserve environment, which includes the sign itself! A nature reserve sign, moreso than most communications systems, exemplifies Marshall McLuhan's most famous adage: "...the medium is the message ...".

Nature reserve signs therefore have a potential for communication at a number of levels beginning with the literal meaning of the words and devices they bear. They realise this potential whether the sender deliberately intends it or not. Effective communication requires a sign to evoke a series of images consistent with the concept, reality and management objectives of the reserve on which it is placed. If these cues and images lack consistency the end result is confusion and disbelief (e.g. Fig. 4). Either way communication takes place. In the one instance the result is supportive of management objectives. In the other it is potentially quite counter-productive.

Design, content and positioning of signs therefore, are of signal importance to successful communication. In so far as design and content are concerned five major factors were assessed during the development of the proposed standard, viz: Audience, purpose, content, image and authorisation.

5. FACTORS OF SIGN DESIGN

Audience

This standard assumes that signs are directed towards

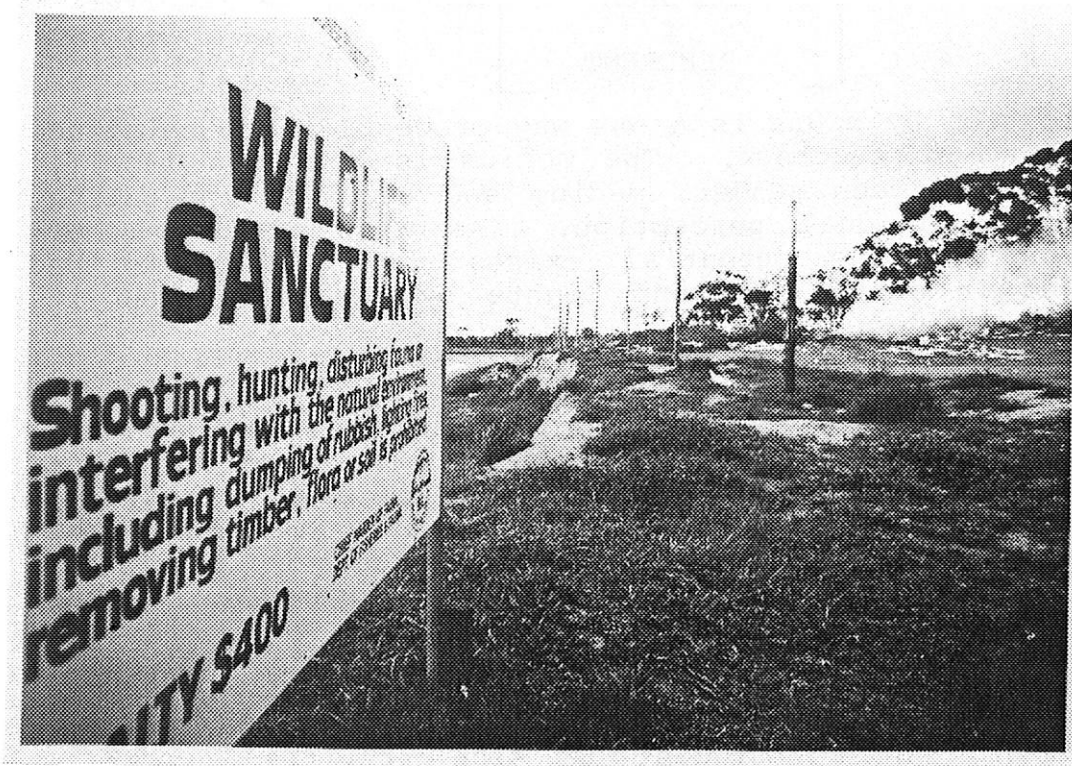


Figure 4. Example of a sign which is inconsistent with its surroundings.

people who are already on or directly en-route to a particular site. It is not intended that signs should particularly attract the attention of casual passers-by.

This assumption embodies one essential difference between the proposed signs standard for nature reserves and signs used on lands such as national parks where public recreation is itself an important objective of management. Here signs can, in certain circumstances, have a legitimate role in promoting a site for public use. It is appropriate that signs used on areas such as national parks should be eye-catching and presented in colours contrasting strongly with their background.

The question of colour schemes of routed wooden signs used in National Parks in various states of Australia and throughout the world however has been a subject of most careful consideration. Signs standards without exception stress the need for both distinctiveness and harmony with the natural surroundings in signs colouring. The U.S. National Parks Service settled for white lettering on a brown background, the Queensland National Parks and Wildlife Service for yellow on brown and the Victorian National Parks Service for ivory on green. The question in all instances has been to achieve both distinctiveness and environmental harmony, the relative measure of each varying a little from place to place depending on individual requirements.

The colour scheme and sizes of signs for the new nature reserve standard were selected so that nature reserve signs would be both distinctive, promoting continuity while avoiding possible confusion with signs erected by other management authorities, and yet harmonise, even blend in to a substantial degree with their surroundings.

Purpose

The need both for brevity and consistency in the cues provided by a sign require clarity of purpose to be a major consideration influencing design. Most signs likely to be needed as part of the standard are placed with one or more of the following purposes:

- i For information and identification
e.g. - Signs identifying and naming nature reserves.
- ii For regulation
e.g. - Signs declaring prohibitions or restrictions on public activity
- iii For education and interpretation
e.g. - Signs indicating special features or interpretive facilities such as displays, maps of walking tracks, etc.
- iv For promotion
e.g. - Signs whose primary purpose is to promote

positive attitudes to nature reserves and an interest in wildlife conservation generally.

The definition of need and purpose followed by critical appraisal of the suitability of consequent sign options is a recognised and deliberate part of the design process.

3. Content

Signs conforming to the new standard usually consist of a combination of words and symbols. The aim is to convey the desired message briefly, in as positive a manner as possible ensuring that the content is relevant to the proposed immediate surrounds of the sign, giving explanations of restrictions where appropriate, and finally stating the Authority by which the sign is erected. The rules governing content are applied as follows:

- i Brevity: Signs intended to be taken in at a single glance by passing foot or vehicle traffic generally contain four words or less of letter size appropriate to their location, distance between sign and observer and the likely speed of passing traffic (see Section 6 : "Specifications of the Sign Standard" and Section 7: "Principles of Application of the Standard").

Some signs, especially those with an interpretive purpose, may contain more information. These are placed at stopping places or in circulation spaces and are intended to be attractive and to invite closer examination.

- ii Positivity: Signs which warn of restrictions or prohibition of certain activities are an essential part of the signs standard. An earlier approach to this need has been to list principal provisions of Wildlife Conservation Regulations as they apply to nature reserves on signs declaring sites to be nature reserves (e.g. Figs. 2 & 4). The proposed new standard is based on the premise that it would be more positive to treat identification of sites as conservation areas and public information of general regulations as separate issues. The latter are to be communicated by newspaper advertising as is the case with such things as Fishing Regulations. Provision, however, is retained in the signs standard for statement of specially important, site relevant restrictions on nature reserve identification signs (Fig 5). The general link between the two is achieved by association of the term "nature reserve"; but whereas signs are the best way of identifying sites on the ground others, particularly the printed media, are better for promoting public responsibility and for enumerating generally applicable rules regarding use of conservation reserves.

This combination maximises opportunities for promotion of public appreciation of the "nature reserve" concept



Figure 5. Examples of nature reserve signs incorporating specially important restrictive messages. The approach of the Two Peoples Bay example parallels in some degree a recent development in the signs standard of the Victorian National Parks Service, where red lettering on a white ground can be used in combination with standard sign colours to give particular visual effect. In the "Two Peoples Bay" example lettering is black and symbols black and red. This sign is placed near the beginning of Two Peoples Bay Road, a cul de sac ending at the nature reserve. Here the desirability of warning intending visitors of restrictions on pets and camping outweigh promotive effects of the sign.



Figure 6. Two examples of restriction signs in which graphic are combined with explanations. Both are at Two Peoples Bay Nature Reserve. The one below is combined with a simple barrier across the track. This use of complementary stimuli improves effectiveness of restrictive signs.



Figure 7. A simple combination of gates, a line of fence and explanatory signs in use at Two Peoples Bay Nature Reserve. The fence, which is open at each end, encloses a parking area. It gives visitors time to pause, examine the major sign in the set (below) and consider their subsequent action.

while providing sufficient notice of legal obligations for law enforcement purposes. It further illustrates the emphasis of positivity of cues in design and wording of signs of the new standard.

Negatives cannot be totally avoided, however. The success of a signs standard will finally rest on willing public acceptance of specific restrictive instructions. Without this acceptance standard signs and the sites they identify will become, by association, objects of derision rather than respect. The key to public acceptance lies in easing the way for compliance. The avoidance of imprecation, well known for its tendency to evoke defensive reactions, and two more positive measures, the use of graphic symbols and the explanation of restrictions (e.g. Figs. 5. 6), employed in conjunction with barriers and other stimuli complementing the sign to guide use patterns (e.g. Figs. 6,7)*, are seen as being of major importance in maximising public co-operation.

Although not wholly relevant to this discussion, it is not possible totally to separate the question of signs from other techniques for guiding public use frequently used together, in an integrated manner. "Explained restriction" signs conforming to this standard are frequently used in conjunction with contrived breaks in roads and pathways and circulation spaces partly enclosed by physical (and sometimes psychological) barriers beyond which the restriction unequivocally applies. Further applications of this approach are described in Section 8 "Case studies of Applications of the Signs Standard".

iii Symbolisation: The use of image symbols to convey messages was pioneered in conservation reserves by the U.S. National Parks Service (USNPS 1970) with considerable success. Since then symbols have been widely adopted by conservation area administrations both in Australia and other countries (N.S.W. National Parks & Wildlife Service 1972, Allwood 1978, Department of Environment & Planning, S.A. 1981 and Victoria National Parks Service 1982) apparently with similarly good results.

The full reason for the success of symbols is not clear in all its detail, but information and warnings of restrictions are more readily communicated by use of symbols, alone or in mutually reinforcing symbol-word combinations than through words alone.

The National Parks Service of the United States of America bases its use of symbols on the following considerations:

- "a. they are more explicit than words. More can be communicated in a shorter time.
- b. They require less space than most phrases which

they replace. Sign size can therefore be reduced.

c. They are more universally understood."

These advantages are primarily operational in nature, and conservation authorities generally apply symbols in an empirical manner. There appears, however, to be some basic principles involved in the relative acceptability of symbols compared with verbal messages. Perhaps the novelty of a combination of graphics presented in eye-catching colours, including, in some examples, use of biologically-based natural warning colours of black and red (Fig. 5) contributes to their success. There are indications also of visitors gaining some satisfaction from the actual process of interpretation of particular symbols. Symbols appear in some instances to be regarded by observers as compliments to their intelligence, especially when compared to the alternative of negative verbal statements reminiscent for many of frustrating restrictions of past (or present) childhood.

In these connections it is of some interest to note that there is little standardisation in colour schemes for symbols. The U.S. standard continues the use of white images on a brown background, a direct extension from their wood-sign colours scheme and the Queensland, Victorian and South Australian approaches are parallel ones.

In all instances prohibition is indicated by overprinting the symbol with a red diagonal slash.

The New South Wales National Parks and Wildlife Service similarly use light colours for the symbol and dark for backgrounds in advisory signs but reverse the tones, adding the traditional diagonal red slash in the case of prohibition.

The Western Australian nature reserve standard follows the general approach of the N.S.W. National Parks and Wildlife Service. Combination of red and black on light-coloured background are used in prohibition symbols, thus taking full advantage of instinctive avoidance behaviour. Symbols indicating permissive uses are in white on a blue ground..

Finally, following experience of the recent huge upsurge and bewildering array of symbols in use in the Americas and Europe, many of which really do tax one's ability to interpret, the range of symbols in use in the present standard is kept under strict control (Fig. 8). It is perhaps fortuitous that, being solely a nature conservation agency, the range of permissive symbols that might be required is substantially less than in the case for an equivalent National Parks



Figure 8. Symbols in use in the signs standard. Prohibition symbols are black on a white background ringed in red with a diagonal red slash. Permissive symbols are reproduced in "negative", the symbol being white, the background blue and the whole being surrounded by a white border.

organisation.

- iv Explanation: Where no alternative exists to the direct statement of a negative instruction (e.g. "no road") the linking of the negative with a sound reason is more encouraging to self-enforcement than the statement on its own (e.g. Figs. 6,7).
- v. Authorisation: With few exceptions signs conforming to the new standard are erected with the explicit authority of the Department of Fisheries and Wildlife. This authority is displayed on the sign in the form of the Departmental insignia (Fig. 8).

Image

Signs evoke an image of the originating Authority in the eyes of the public. This occurs regardless of intent and it is perhaps better to set out to foster a favourable one during the design stage than have it imposed by default. Signs conforming to this standard are intended to project the Authority and the Department as organisations which are consistent, authoritative and sensitive, both to the sensibilities of people and to the marvels of the natural world they purport to manage.

Glance Appreciation

The idea of "glance appreciation" is defined for the purpose of this standard as a means of assessing the overall effectiveness of a sign. Its components include both technical and aesthetic aspects of design, the co-ordination of material elements such as surfaces, shapes, supports, type-styles and colours into the whole and the success of application of the finished product in its surroundings and purpose. Glance appreciation value is maximal when sign elements combine to facilitate immediate recognition and 100 per cent compliance/acceptance. The concept is applied in recognition that the best available is always capable of improvement.

6. SPECIFICATIONS OF THE SIGNS STANDARD

Materials and Construction

Standard "nature reserve" and advisory and instruction signs, which together constitute the great majority of signs likely to be required on nature reserves, are constructed of one or more hardwood or pine boards bearing routed letters, symbols and, in special cases, maps which make up the message. Message boards are supported by tanalith treated pine posts according to construction detail shown in Fig. 19.

Nature Reserve signs

Standard "nature reserve" signs consist of two boards generally laid out and spaced as shown in Figs. 9 and 10.

The design permits batch construction of all standard components to which only individually lettered name boards need be added to manufacture complete signs. Layout and spacing of lettering and message boards, however, are not required always to be precisely to specifications shown in the drawings. Examples of variants are illustrated in Figure 11.

These signs may be single or double sided as shown in Fig. 9. Where needed additional boards may be added to carry further information, (e.g. Figs. 5,6).

Advisory and Instruction Signs

Single and multiple board instruction signs follow "nature reserve" signs in their construction (Fig. 12). Provision is generally made for use of symbols.*

Interpretation and Display Signs

Greater latitude is provided in construction and presentation of interpretive and display signs, the use of which is at an early stage of development in the context of Western Australian nature reserves. An examples of display signs constructed for the present standard is illustrated in Fig. 13.

Size and Lettering

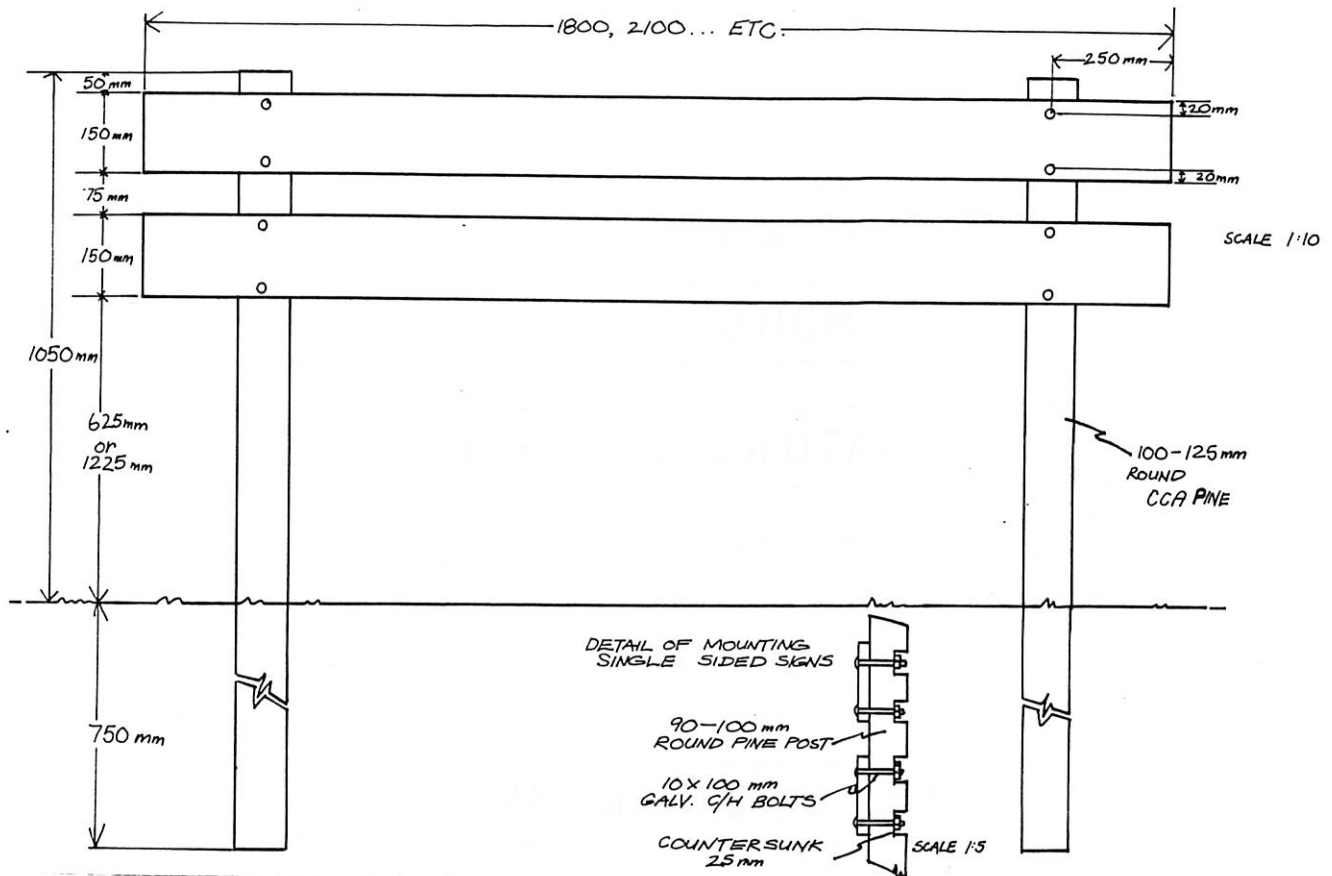
All lettering is Helvetica upper case, routed in message boards using an HV22 routing bit. Two letter sizes, 60 mm and 75 mm, are in standard use (On 140 and 150 mm boards, respectively) according to application and the letter height:legible distance relationship shown in Fig. 14. Provision is retained in the standard for use of larger letter sizes, and message boards in proportion, as required.

Symbols and Emblems - Standard

Symbols and emblems are of 1 mm zinc annealed steel silk-screen printed according to the range of designs shown in Fig. 8. Emblems carrying the crest of the Department of Fisheries and Wildlife are square, the larger being 100 x 100 mm and the smaller 90 x 90 mm for use with 75 and 60 mm lettering respectively. The crest and lettering (on the larger emblem only) are black on a white ground with the stem of the kangaroo paw picked out in red and the flowers in green.

Symbols denoting prohibition, restriction and permission of various activities are presented on circular plates 108 mm

*Maps may be built into multi-board advisory signs where necessary to define areas affected by specific provisions. An example of this kind of sign is shown in Figure 7.



- Double Sided Signs

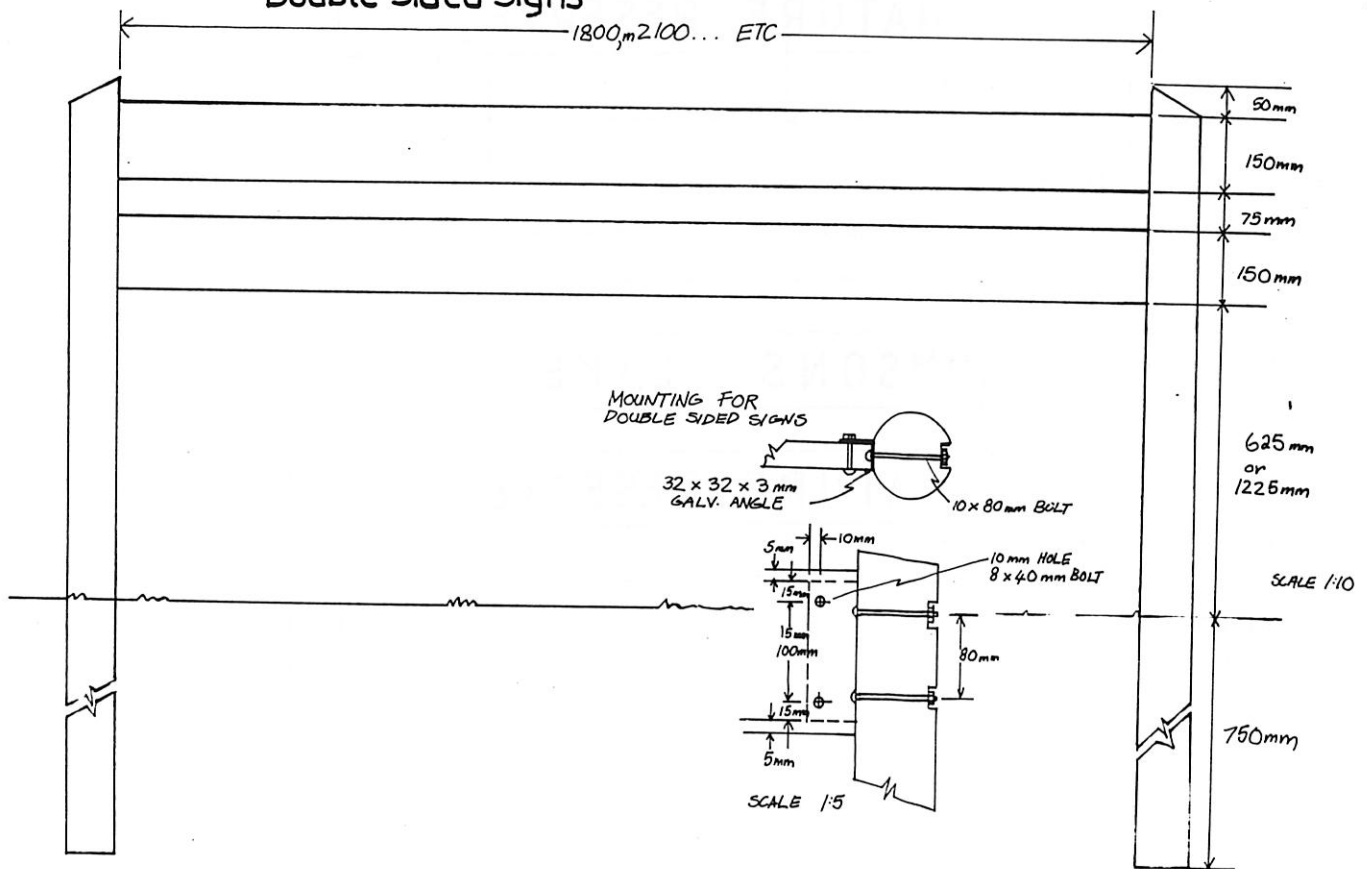


Figure 9. Specifications of "nature reserve" signs : construction.

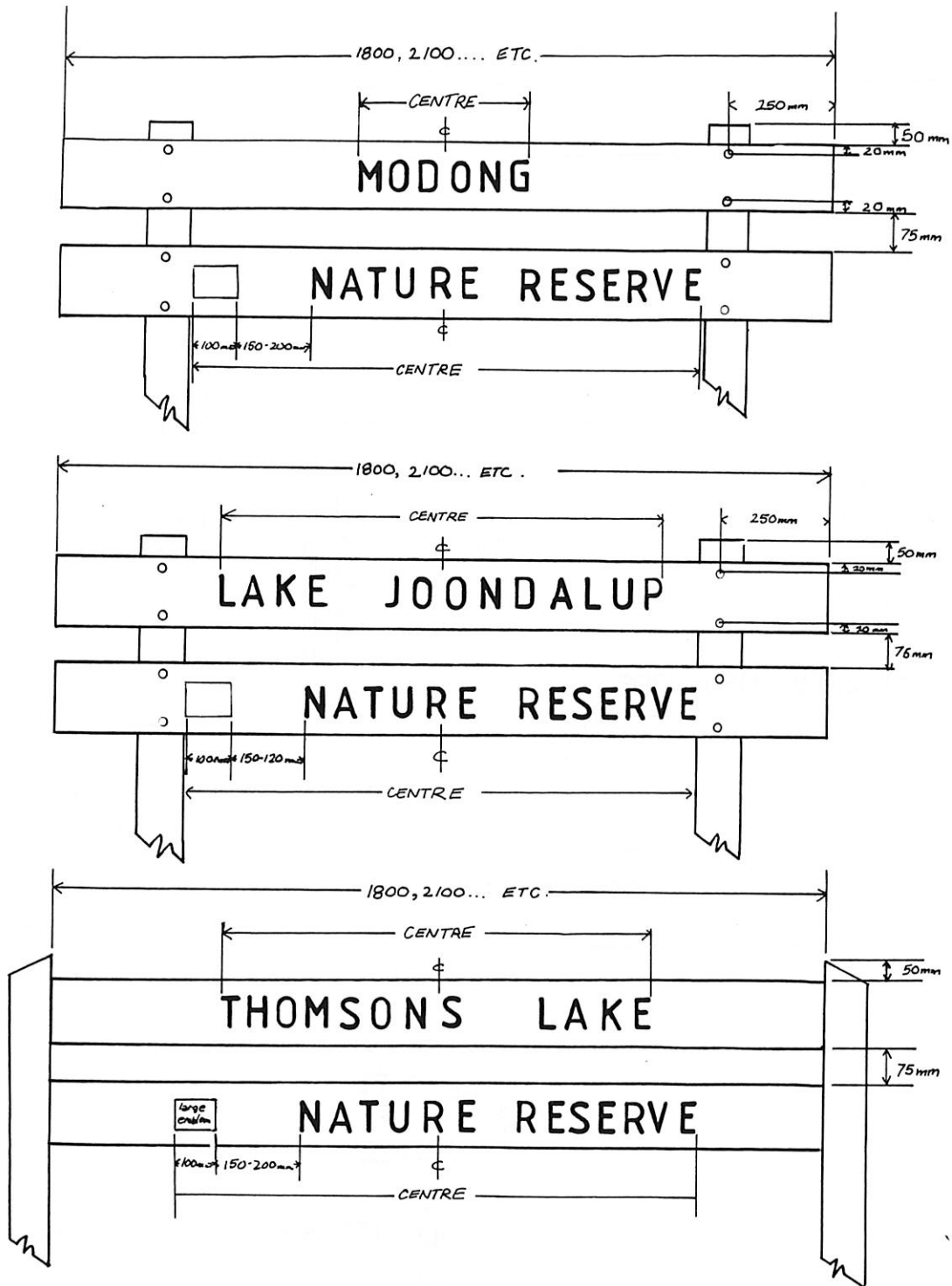


Figure 10. Layout of "nature reserve" sign.

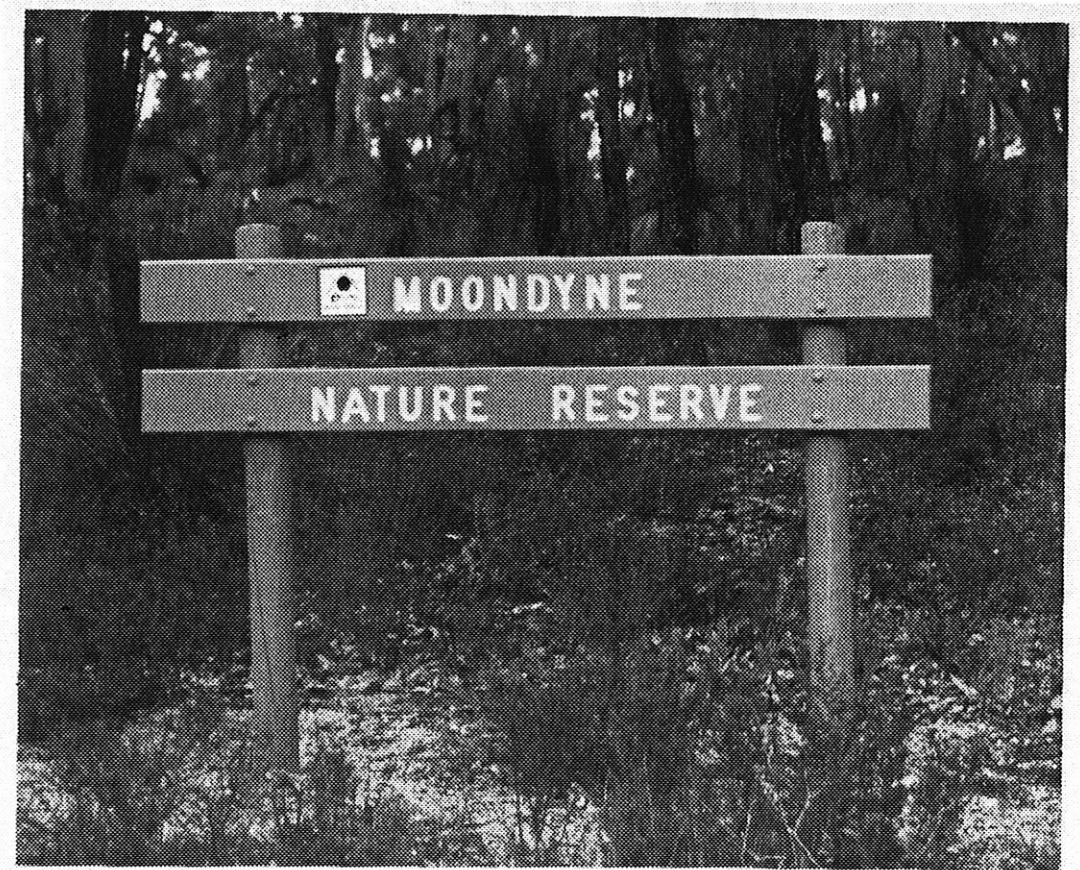
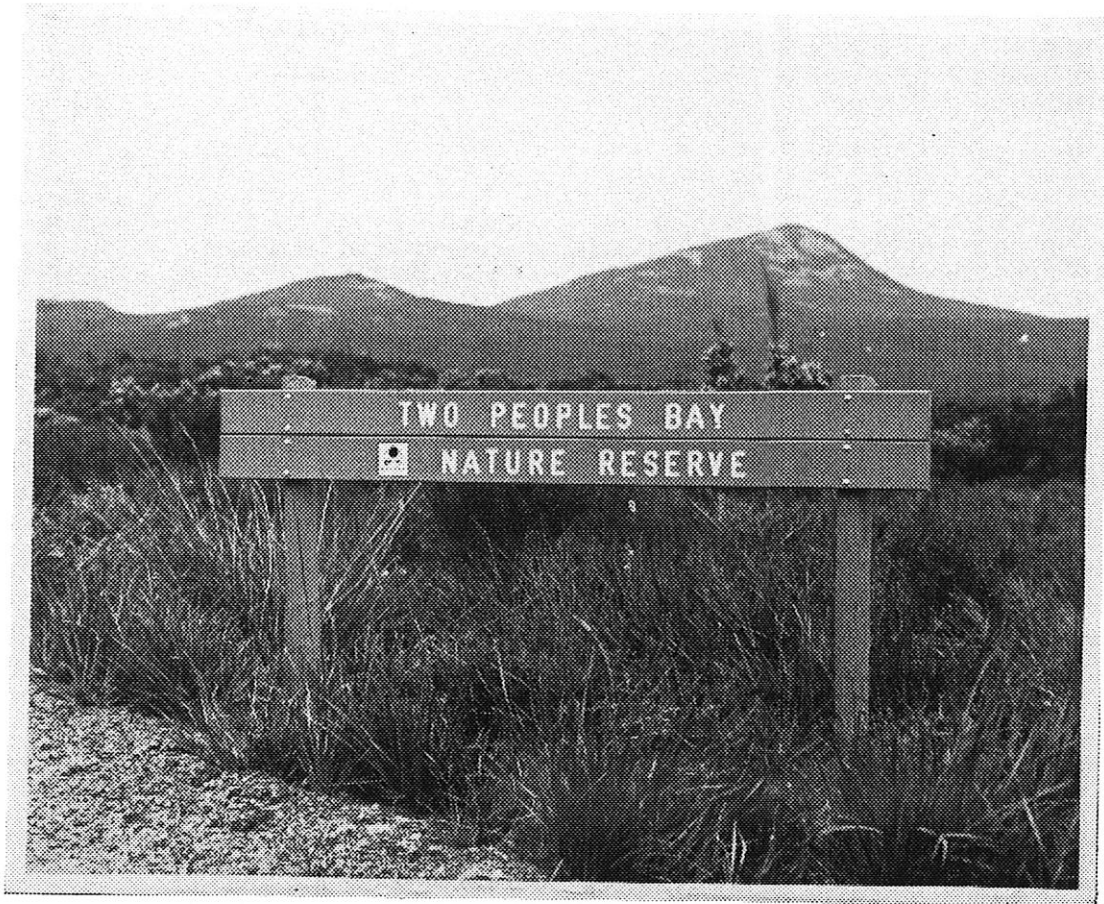


Figure 11. Variants of the standard "nature reserve" sign.

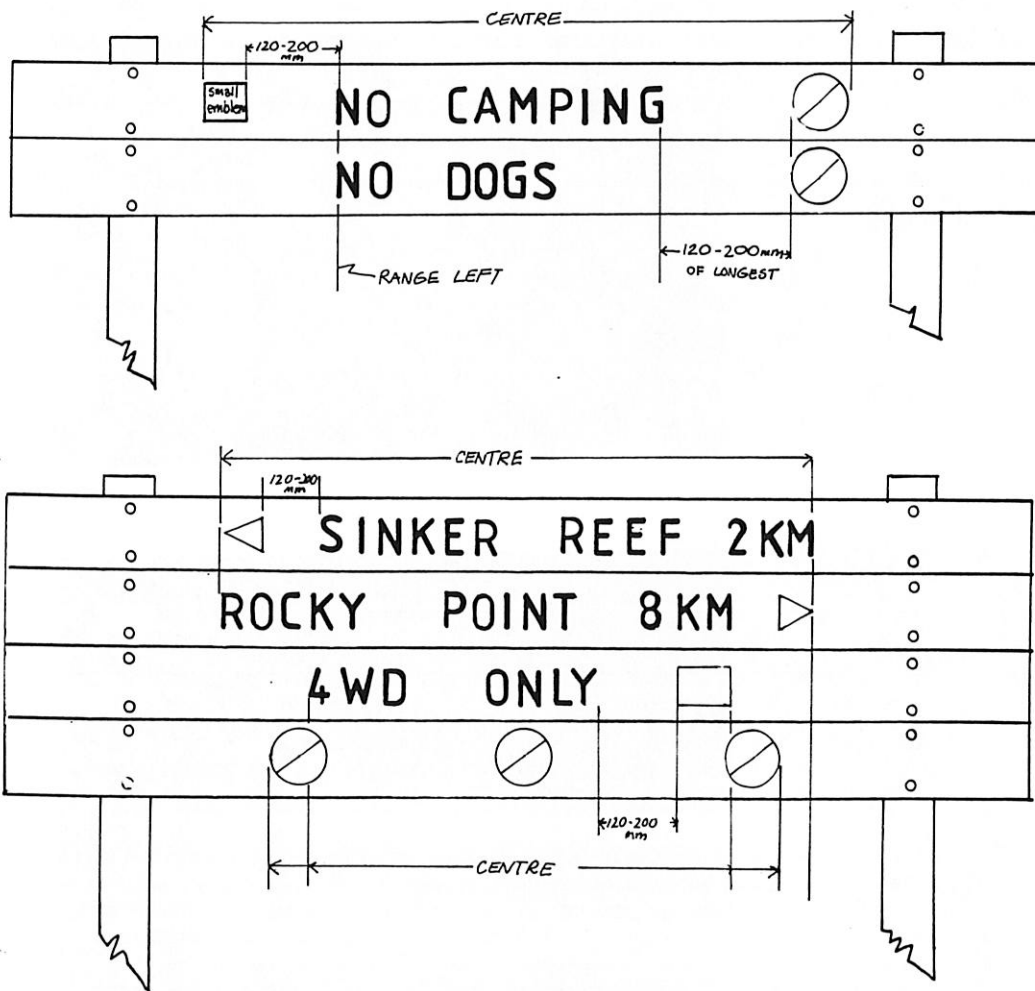


Figure 12. Layout of some advisory and instruction signs.

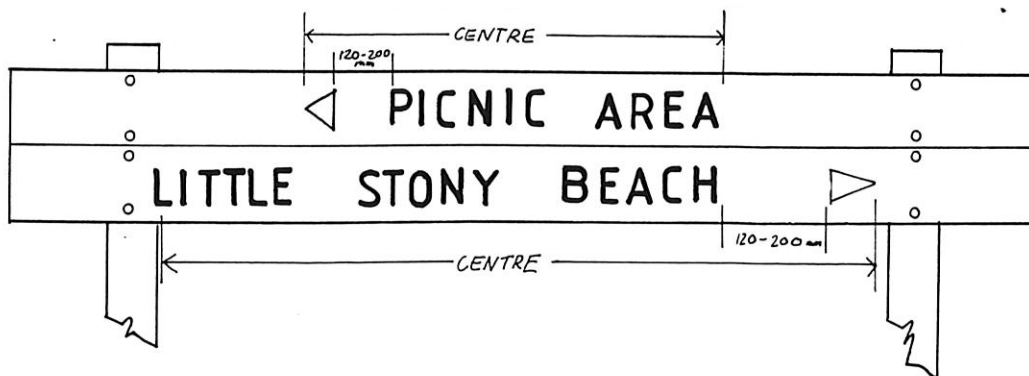
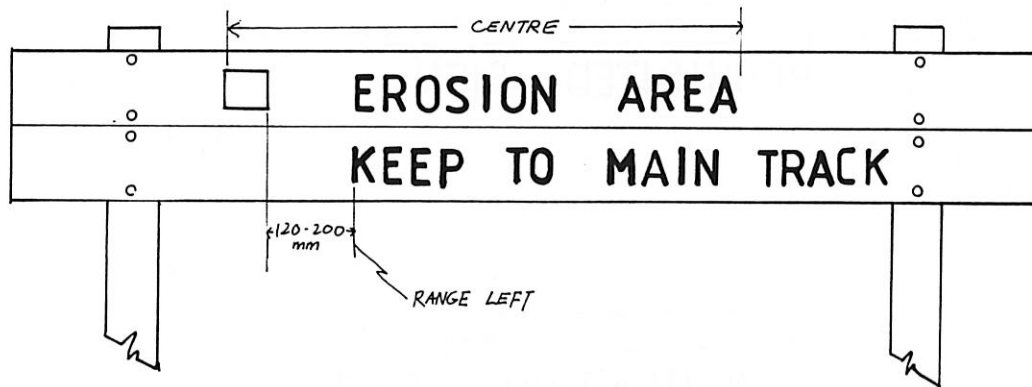
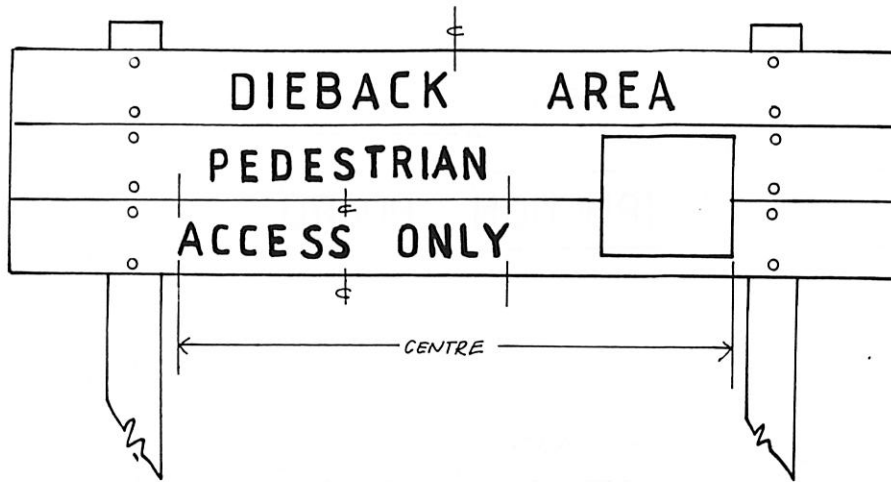


Figure 12. - cont'd...

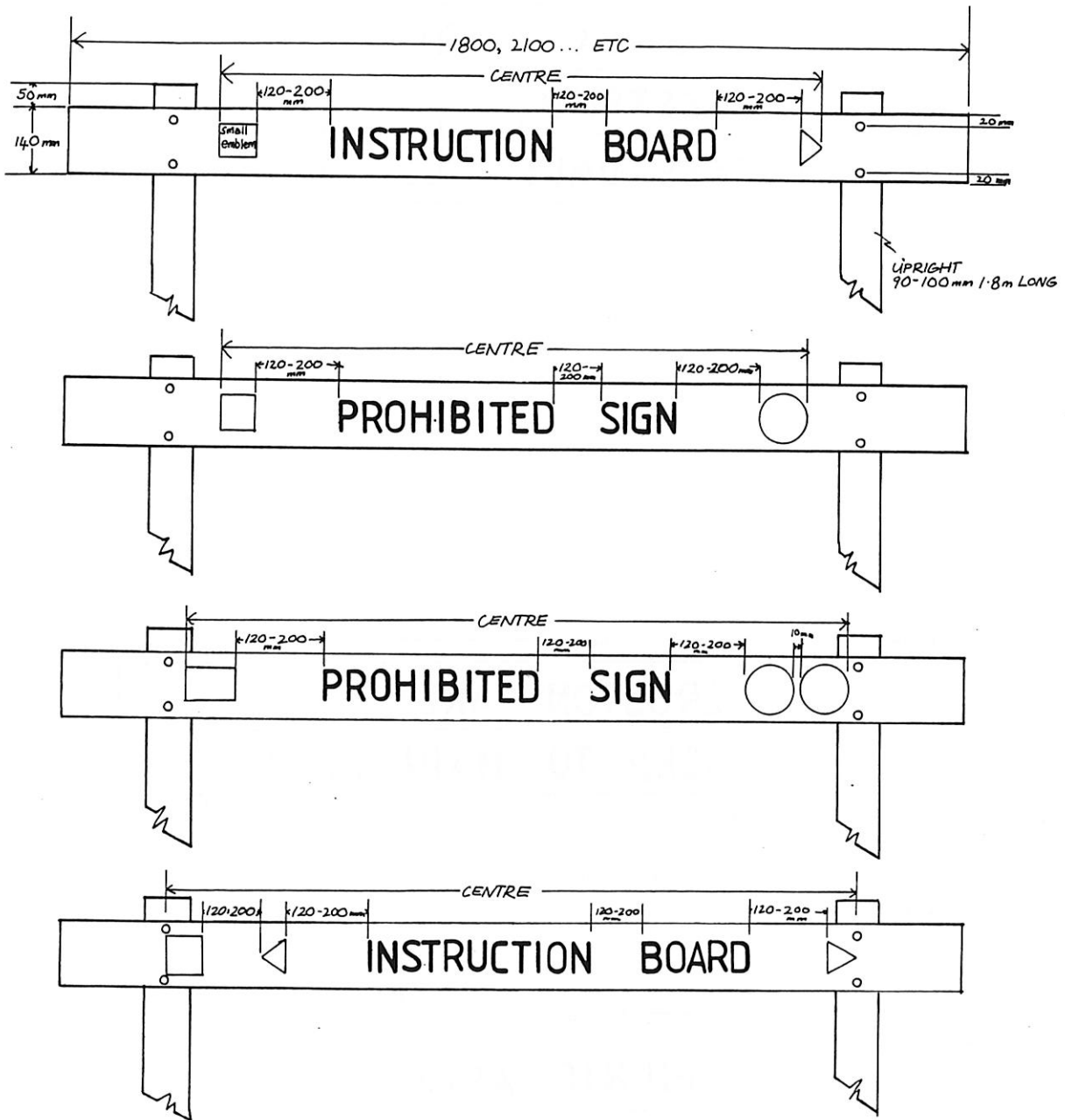


Figure 12. - cont'd...



Figure 13. A partially completed display sign at Thomsons Lake Nature Reserve. This sign also demonstrates poor attention to placement. It has subsequently been re-erected 40 cms lower.

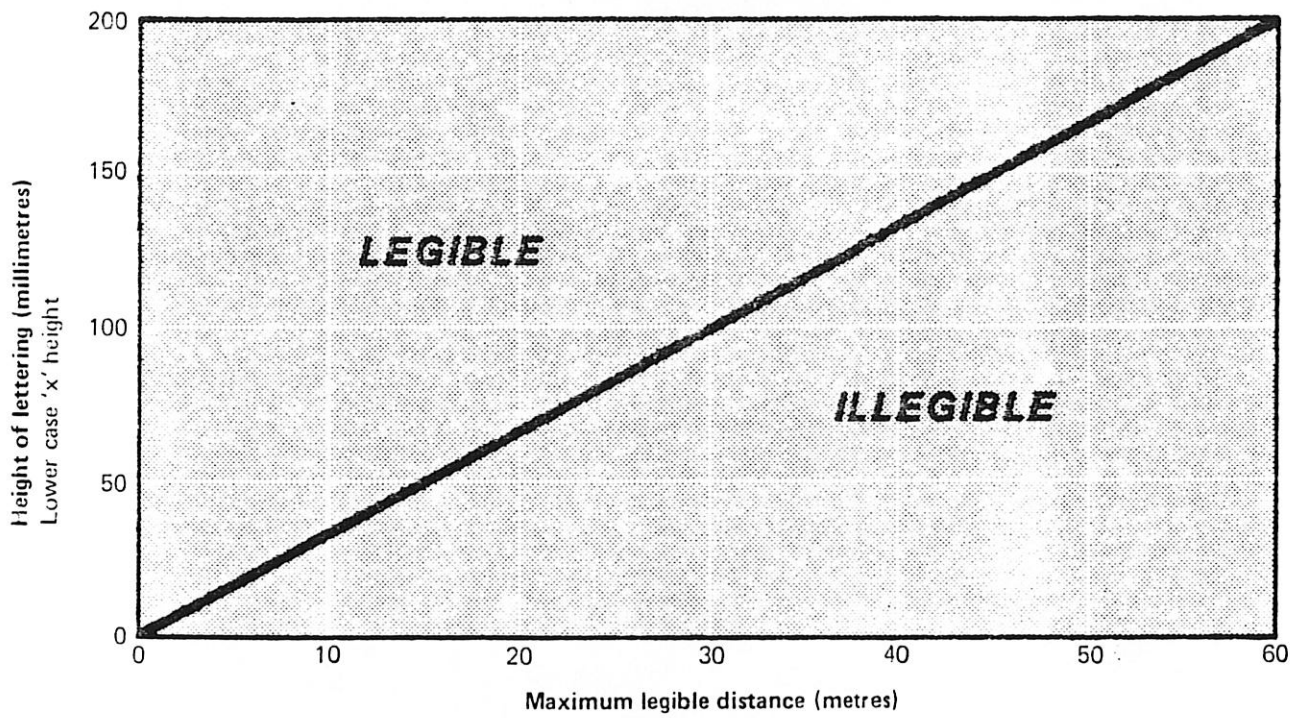


Figure 14. Letter size distance relationship (After Allwood 1978).

in diameter. For symbols denoting prohibition the activity is depicted with a black symbol against a white ground, the whole being surrounded by a circular rim of red colour, with a diagonal red slash across the symbol. For symbols denoting permission the activity is depicted in white on a blue ground, the whole being surrounded by a white border.

Symbols and Emblems - Maps

Where needed to define areas to which particular restrictions apply, maps are used as integral parts of three-boarded variants of the "advisory and instruction sign" (Figs. 7, 12). Maps are silk-screen printed on 1 mm zinc annealed steel plate using appropriate colours on a beige base.

Finishing

Boards and posts are finished in "Walpamur" "pine log green" (GPC V115/3) acrylic paint and lettering in "British Paints" "primrose yellow" oil based enamel (BS 4800 : 1972 code 310).

7. PRINCIPLES OF APPLICATION OF THE STANDARD

Questions of where and in what circumstances to use signs, of placement, heights above ground, height-breadth relationships, angles of vision and many similar considerations together constitute the subject matter of "Application of the Nature Reserve Signs Standard" a separate, technically-orientated document in preparation as part of the "Western Australian Nature Reserve Management Operations Manual". The principles of application of the Western Australian standard are firmly based on standards developed by agencies such as the U.S. National Parks Service, the Queensland National Parks and Wildlife Service, the Victorian National Parks Service and the South Australian Department of Environment and Planning.

8. CASE STUDIES OF APPLICATIONS OF THE STANDARD

Beginning in January 1981 signs conforming to the new standard were erected on five nature reserves which are subject to significant levels of public use, viz:

Nature Reserve	Region	No. visitors/year (order of magnitude)
Carnac Island	Perth	$10^3 - 10^4$
Modong	Perth	$10^2 - 10^3$
Moodyne	Perth	$10^2 - 10^3$
Thomsons Lake	Perth	$10^3 - 10^4$
Two Peoples Bay	Albany	$10^4 - 10^5$

These case studies included different kinds of advisory and instructional signs in addition to standard "nature reserve" signs. Advisory and instructional signs were

erected in conjunction with a variety of complementary movement channelling structures developed in parallel with the signs standard for Western Australian nature reserve requirements.

Effectiveness of the sign systems erected on the five reserves were appraised using the three following criteria:

Damage: Damage to a sign was regarded as a priori evidence of its failure as a means of communication.

Public interview: Reaction to the new signs was directly sought from visitors to a number of reserves.

Direct assessment of conformity: In some instances it has been possible to estimate levels of conformity/non-conformity to instructional signs directly although controlled and quantitative data are generally not available.

Carnac Island Nature Reserve

The Reserve

Carnac Island (16 ha., 5 km west of Fremantle) is a most popular visiting place for those in the Perth region who enjoy boating. It offers a sheltered anchorage and a protected, east-facing beach. The nature reserve is an important sea-bird breeding site, supporting a variety of gulls, terns, shearwaters and other birds, and the habitat of a dense population of tiger snakes (Notechis scutatus) and King's Skinks (Egernia kingii).

The Signs

During the winter of 1981 standard "nature reserve" signs and signs warning of tiger snakes were erected to replace the older-style metal signs on the island. A low cliff at the northern end of the eastern beach, eroding as a result of visitors scrambling up to the headland above, was fenced out and sign-posted as a "no path" area (Fig. 15).

Results

The island is not visited regularly by management staff. No damage has occurred to signs, however, and use of the eroding area has been reduced to an insignificant level. Visitor interviews indicate a high level of public appreciation and acceptance of the signs.

Modong Nature Reserve

The Reserve

Modong is one of the nature reserves of the Shire of Serpentine-Jarrahdale (Crook 1981). It is 154 ha in area and consists of Jarrah-Banksia and paperbark woodlands on Bassendean, grey-sand dunes. It is regarded as a key site

representing the habitats of this dune system which has been subject to fires at less frequent intervals than the, in some respects, similar Thomsons Lake Nature Reserve (below). It has considerable value as a research area for post-fire regeneration studies.

Modong also lies within an expanding "urban-rural" development area. At the time of development of the management plan it was becoming subject to increasing use for recreation, especially horse-riding. The management plan provided for the channelling of this activity along the perimeter firebreak. Sign-posting has been part of the management initiative to put this plan into effect on the ground.

The Signs

During the summer of 1980-81 "Modong Nature Reserve" signs were erected on Thomas Road, a major arterial route (Fig. 16), and signs drawing attention to the bridle path on the firebreak. In November 1981 "No Road - Management Track" signs were placed together with short lengths of fence and gates across each end of an east-west, central track across the reserve (Fig. 16).

Results

No damage has occurred to signs, including those on Thomas Road. Use of the central track by horse riders, which was frequent and uncontrolled prior to sign-posting, ceased entirely as a result of signs and the associated gates and fence. Reserve neighbours actively support the management programme.

Moondyne Nature Reserve

The Reserve

Moondyne (1991 ha., 60 km north-east of Perth) is near the western fall of the Darling Range close to the northern limit of the occurrence of Jarrah as a forest dominant. Moondyne contains a variety of forest and woodland communities which is further enhanced by the diversity of soils and landforms, from sandplain to laterite plateaux, represented there. A recent survey revealed 287 species of flora and is indicative of the nature conservation value of the reserve.

Moondyne is the subject of a management plan (Crook and Evans 1981) which was prepared in response to increasing levels of public interest from bushwalkers and naturalists and which provided for curtailment of activities such as rally driving on bush fire access tracks. As a result of the plan all parts of the reserve, except for gazetted roads, were closed to vehicular traffic, the greater part of the nature reserve being classified a limited access area.

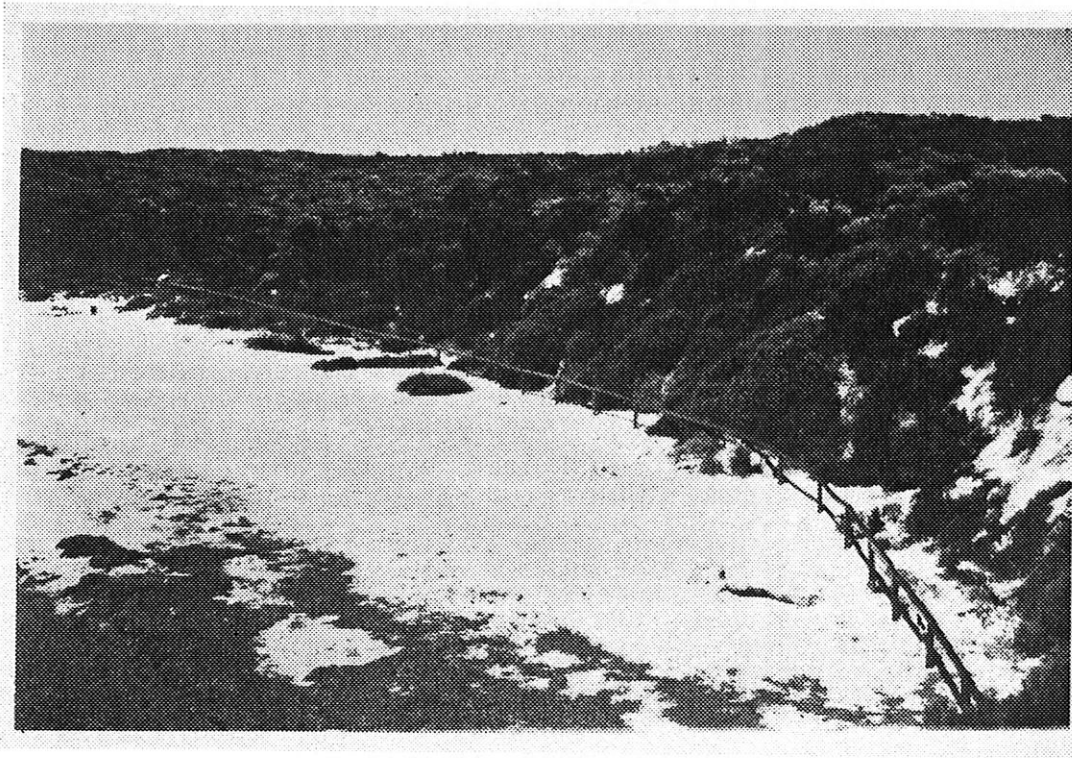
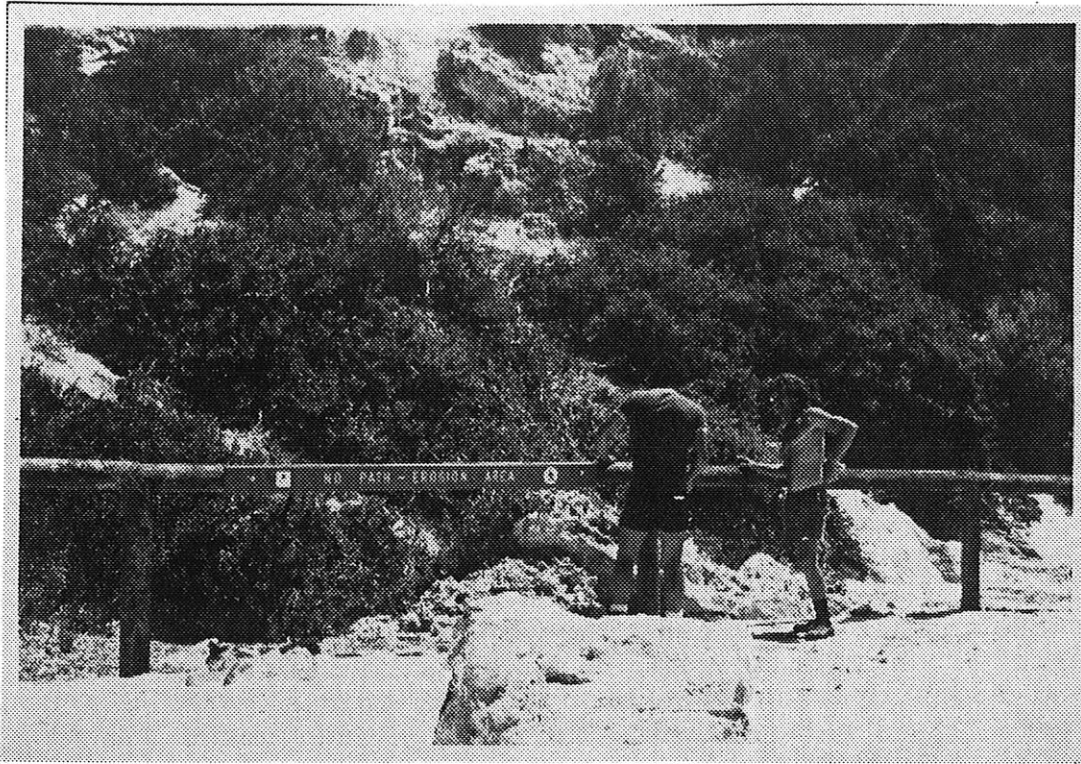


Figure 15. Signs and complementary fencing on Carnac Island.

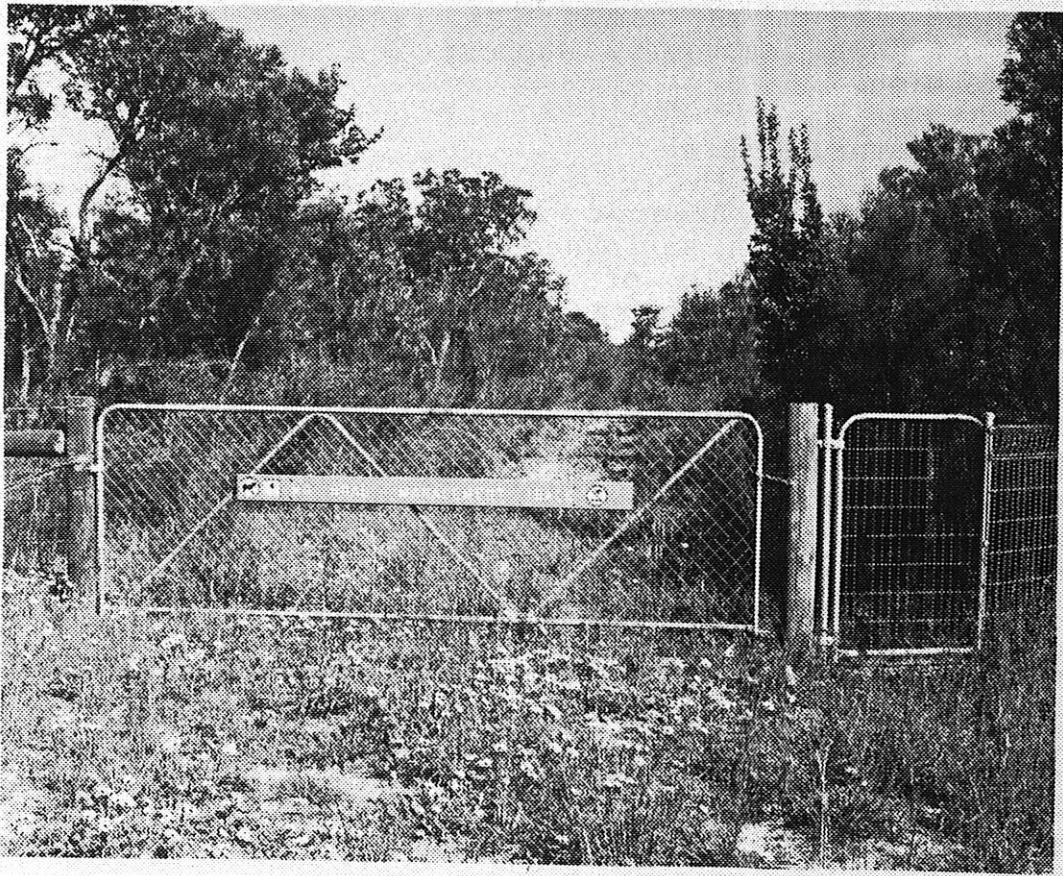
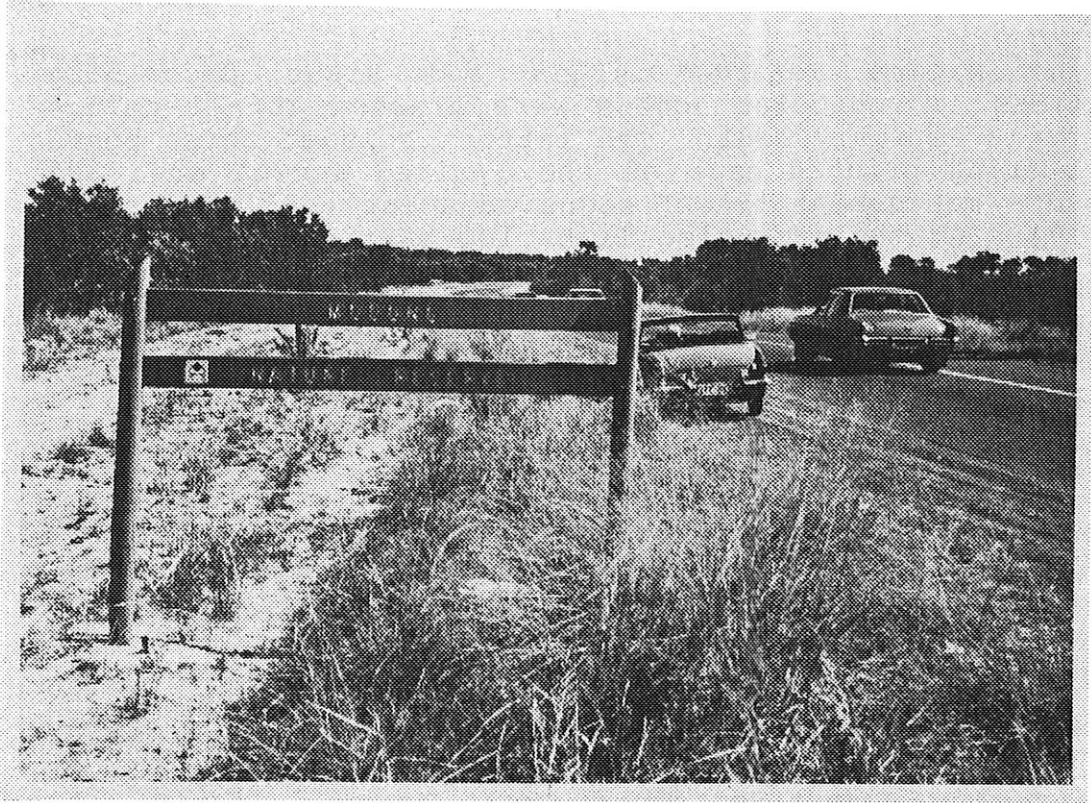


Figure 16. Signs at Modong Nature Reserve, a conspicuously successful example of application of the signs standard.

The Signs

"Moondyne Nature Reserve" signs and signs describing limitations to vehicular access were erected at all points of entry in February 1981. The latter included three board signs bearing printed maps of the limited access area and "no road - management track" signs adjacent to closed roads (Fig. 17). At the same time light log barriers were placed across closed road sections.

During the summer of 1981-82 the latter were replaced with fence-gate combinations similar to those in use at Modong (Fig. 16).

Results

No damage has occurred to the signs. Of the total of 14 four lost metal plates bearing the Departmental insignia. It is not certain whether this was the result of souveniring alone or poorly mixed "araldite" adhesive used to fix them in place. Log barriers in conjunction with signs were not wholly successful in stopping unauthorised traffic. The barrier shown in Fig. 17 was driven round by an average of one or more vehicles per week during the winter-spring of 1981. During August-September 1982, however, during the height of the spring flowering season, and following completion of the gate-fence barriers, no unauthorised use of this same length of track was recorded. Reserve neighbour and local authority support for the management programme is high.

Thomsons Lake Nature Reserve

Thomsons Lake Nature Reserve (509 ha) consists of a freshwater lake (190 ha) surrounded by woodland and forest communities characteristic of three major Swan Coastal Plain habitats. This outstanding nature reserve, from which over 120 birds and 300 species of native flora have been recorded, lies within the Perth Metropolitan area, 34 km south-west of Perth.

The nature reserve was the subject of a management plan which received Ministerial approval in March 1981 (Crook and Evans 1981). The plan included provision for development of interpretive facilities and rationalisation of existing use of the area for recreation as two of its major objectives. Conflict between high levels of use by horse riders and other management objectives was resolved in principle by a proposal to channel all equestrian activity onto a bridle trail constructed for the purpose around the perimeter of the reserve.

The Signs

Eighteen signs have been erected on the Reserve. These, intended to guide public use, are used in conjunction with fencing, paths and circulation spaces. The perimeter bridle trail is defined for all its length by a post and



Figure 17. Signs at Moondyne Nature Reserve. Note the tyre tracks showing that vehicles have been circumventing the log barrier across the track. This problem largely ceased after the informal log barriers were replaced with lengths of fence and gates.



Figure 18. The bridle trail on Thomsons Lake Nature Reserve.

wire fence (Fig. 18).

Results

Unauthorised incursion by horses has subsided to negligible levels since the sign and fencing programme was completed in March 1981. Public use of a more passive kind (walking, bird-watching, etc.) is increasing rapidly. Visitor interviews show high levels of acceptance and frequent appreciation of the "new" image of management. Separation of use for horse-riding and walking is a major factor behind resurgence of visitor use in general.

A number of Departmental insignia have been lost from signs, partly from the attentions of souvenir hunters and partly from faulty adhesive. No other damage to signs has occurred.

Two Peoples Bay Nature Reserve

The Reserve

Two Peoples Bay is one of the most important nature reserves in Western Australia. It is the habitat of a number of rare bird and plant species, including the world-famed Noisy Scrub bird (Atrichornis clamosus). Its ha area supports good examples of coastal heath and woodland communities in a magnificent setting, and it is a very popular recreation site. The nature reserve is visited by about 35 000 people/year.

The Signs

All signs on the reserve have been progressively replaced during the past two years. In addition, a Limited Access Area, declared around Moates Lake following confirmation of the occurrence of the Jarrah root-rot fungus Phytophthora cinnamomi at two separate locations, has been delineated by signs at major access points. All vehicular access to the area is prohibited. Pedestrian access is not affected. Moates Lake is a popular marron fishing site. During the marron season preceding declaration of the Limited Access zone 120 vehicles per week entered the area. During the season after declaration of the zone approximately 60 vehicles per week used the parking facilities created at its edge. Less than five motorists attempted to drive on the closed tracks during the whole, four months season. Examples of signs erected on Two Peoples Bay Nature Reserve are shown in Figs. 5, 6, 7 & 11.

9. SUMMARY AND CONCLUSION

The success of a signs standard is measured in terms of its effectiveness as a form of communication. As such the signs standard sets out to clearly identify nature reserves as distinct from other Crown lands and through continuity of design supports the idea that each nature reserve is part of a system. In this connection design plays an

important part in establishing an impression of the nature reserve concept in the public mind.

Sign content and location should support these initial impressions. The signs standard is based on the supposition that communication of content is best achieved by using brief, where possible positively worded signs reinforced with graphic symbols, the whole structure being placed with sensitive regard for interactions between visitor, signs and natural environment.

In this respect it is important to note that, as an application of Communication Theory, the signs standard has had a largely empirical development influenced by approaches to people management used in conservation areas in a number of countries. As a means of communication, however, the signs standard does not stand alone. A number of examples given in the case studies indicate the importance of mutually supportive cues other than those provided by the sign itself.

Although the results of the case studies are neither quantitative nor controlled they are sufficient bases for conclusion that the proposed standard is an effective means of communication. Improvement, and its further investigation as an application of communication principles can best be achieved by its full scale implementation in the field.

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APPENDIX I : EXCERPTS OF THE WILDLIFE CONSERVATION
ACT (1950 AS AMENDED) AND REGULATIONS

1. The Act:

12A. (1) If the appropriate written approval required by section twelve B of this Act is first obtained by the Authority, the Authority may, with the approval of the Minister, by notice published in the *Government Gazette*, classify or reclassify in accordance with this section any area of land or part thereof comprised in a nature reserve or wildlife sanctuary that is specified in the notice.

Power of Authority to classify sanctuaries. Added by No. 45 of 1967, s. 10. Amended by No. 67 of 1975, s. 10.

(2) Areas of land comprising the whole or part of a nature reserve or wildlife sanctuary may be classified or reclassified under subsection (1) of this section as follows:—

- (a) prohibited areas;
- (aa) restricted areas;
- (b) limited access areas;
- (c) shooting or hunting areas;
- (d) unlimited access areas;
- (e) such other classes of areas as the Authority thinks necessary for the purpose of giving effect to the objects of this Act.

(3) The Authority may by publishing a notice of cancellation in the *Government Gazette*, cancel the classification or reclassification of any area under this section and thereupon the area ceases to be an area classified or reclassified under this section.

(4) Nothing in this section shall prejudice the operation of the Land Act, 1933.

Power of Authority to prepare management scheme. Added by No. 45 of 1967, s. 13. Amended by No. 99 of 1969, s. 5; No. 67 of 1975, s. 13; No. 86 of 1976, s. 22.

12D. (1) The Authority shall, in respect of each nature reserve that is classified or reclassified pursuant to section twelve A of this Act or any area of land of which the Authority is the owner, cause to be prepared a detailed written scheme of the operations that the Authority proposes to undertake on or in relation to the area for such period, not exceeding ten years, as is specified in the scheme.

(2) The objects of the scheme shall be the maintenance, study, care and restoration of the natural environment, the protection and care of fauna or flora, the propagation thereof, the promotion of the study of fauna or flora to which the scheme relates and such other objects relating to the conservation and protection of fauna or flora as the Authority recommends and the Minister approves.

(3) A scheme prepared for an area under subsection (1) of this section—

- (a) shall be submitted to the Minister for his written approval;
- (b) is subject to existing rights under concessions, leases and permits granted in respect of the area,

and if the scheme is so approved by the Minister it shall be the working plan for that area.

(4) No operations shall be undertaken on or in relation to any area of land in respect of which a working plan has been made in accordance with this section, unless those operations are in accordance with that plan.

(5) A working plan made under this section may, with the written approval of the Minister, be varied from time to time or cancelled and another plan substituted.

(6) A working plan made under this section may contain provisions for the Authority to carry out any work in connection with the improvement, development and maintenance of any area of land to which the plan relates, and the prevention and control of fires.

(7) The Authority may, with the approval of the Minister, arrange with—

- (a) the Minister administering any Government Department of the State; or
- (b) any statutory corporation,

for the carrying out by that Department or statutory corporation of any work authorised under a working plan to be carried out by the Authority in accordance with the plan.

2. The Regulations:

Heading amended by G.G., 24/12/76, p. 5056.

PART b.—CONTROL OF NATURE RESERVES AND WILDLIFE SANCTUARIES.

General.

Amended by G.G., 24/12/76, pp. 5056-57.

42. (1) The control of all nature reserves shall, for the purposes of the Act vest in the Authority.

(2) (a) A person shall not take any fauna, whether protected or not protected, on any nature reserve unless authorized to do so by the Conservator of Wildlife.

(b) The Conservator of Wildlife may not give such authority except—

(i) on the recommendation of the Authority pursuant to section 12E of the Act or in accordance with the terms of an approved management scheme or operations or working plan prepared pursuant to section 12D of the Act;

(ii) in the case of a nature reserve or part thereof classified as a shooting or hunting area pursuant to the provisions of the Act, he may issue the appropriate licence to take game in accordance with these regulations:

or

(iii) in the case of an animal declared to be a declared animal under the Agriculture and Related Resources Protection Act 1976, he may issue the appropriate licence for its destruction subject to such conditions as he thinks fit.

43. (1) Subject to whatever duties, rights and privileges remain to the owner or occupier of land secondly referred to in the interpretation "sanctuary" in section 6 of the Act or which may devolve on a person by virtue of the terms of the agreement referred to in that section, the control of any such land shall vest in the Authority.

Amended by G.G., 24/12/76, p. 5057.

(2) (a) A person shall not take any fauna, whether protected or not protected, on any wildlife sanctuary unless he has been authorized to do so by the Conservator of Wildlife.

(b) The Conservator of Wildlife may not give such authority except—

(i) with or subject to the approval of the owner or occupier of such land;

(ii) on the recommendation of the Authority, or in accordance with the terms of an approved management scheme of operations or working plan prepared pursuant to section 12D of the Act; or

(iii) in respect of an animal declared to be a declared animal under the Agriculture and Related Resources Protection Act 1976.

44. (1) A person shall not deposit or leave any offal, refuse, rubbish or litter of any kind in any nature reserve or wildlife sanctuary except in a receptacle provided by the Authority for the purpose, or break any bottle, glass or cup, or suffer such to remain in any nature reserve or wildlife sanctuary.

Amended by G.G., 24/12/76, p. 5057.

Penalty: One hundred dollars.

(2) A person shall not—

(a) camp on any nature reserve or wildlife sanctuary; or

(b) build, erect or transport any tent, shed, outhouse, cottage, building, or any structure whatsoever in any nature reserve or wildlife sanctuary,

except by permission in writing of the Conservator of Wildlife and in a part set aside for such purpose pursuant to the Act and regulations.

(3) A person shall not deposit, leave or abandon any vehicle, vessel or conveyance of any kind or any part thereof in any sanctuary.

Penalty: One hundred dollars.

(4) If the owner or the person responsible for depositing, leaving, building, transporting or abandoning any offal, refuse, rubbish, litter, tent, shed, cottage, building, structure, vehicle, vessel or conveyance or any part or parts thereof can be determined, the Conservator of Wildlife may, orally or by written notice served on the owner or other person, direct the owner or other person or both to remove the offending thing or things from the nature reserve or wildlife sanctuary by any specified means within any reasonable specified period and refusal or failure to comply with such written directions shall be an offence.

Penalty: One hundred dollars.

(5) After expiration of the period specified in a direction given under sub-regulation (4) of this regulation, the Conservator of Wildlife may, if the thing or things have not been removed, himself arrange for the removal and where such owner or other person is convicted of any offence referred to in this regulation, the justices before whom the complaint is heard may, in addition to any penalty, order a sum of money sufficient to meet the expenses involved in the removal of such rubbish or other mentioned thing or things to be paid by the defendant to the Conservator of Wildlife, which such sum may be recovered in the like manner as a penalty under these regulations may be recovered.

(6) Where the owner or person responsible for such thing or things cannot be determined, the Conservator of Wildlife, may order its sale and removal from such nature reserve or wildlife sanctuary or its destruction by any practicable means, having regard to the purpose of the nature reserve or wildlife sanctuary and its proper management and the care of the fauna in it, and the net proceeds of such sale shall be credited to the Consolidated Revenue Fund after meeting any costs involved without any redress to the owner for any loss or inconvenience to which he may be subjected thereby.

Amended
by G.G.
24/12/76,
p. 5057.

45. (1) A person shall not take upon, or allow to enter or suffer to remain in or upon, any nature reserve any animal or plant or the eggs, seeds or source of reproduction of any animal or plant not indigenous to that nature reserve and any wildlife officer or honorary wildlife officer may, if he finds it impracticable to remove them alive, kill or destroy by any means any such non-indigenous animal or plant or eggs or seeds or source of reproduction thereof on any nature reserve and remove them from the nature reserve.

(2) The provisions of subregulation (1) of this regulation shall not, except as provided hereunder, prevent a person licensed to take game species from taking under his control on any game reserve a trained gun-dog, but such a person shall, if directed by a wildlife officer on reasonable grounds, remove forthwith such gun-dog from the game reserve and shall if so directed by a wildlife officer take all necessary measures to prevent the dog from entering upon that or any other game reserve or other nature reserve.

Amended
by G.G.
24/12/76,
p. 5057.

46. Except as the Conservator of Wildlife may authorize in pursuance of a management scheme or working plan or in the administration of the Act and these regulations, a person shall not, in respect of any nature reserve or wildlife sanctuary—

- (a) remove or disturb any humus, leaf mould, rotting vegetation, soil, stone, sand, rock or gravel;
- (b) cut, pick, pull, break, remove, injure, poison, strip or destroy any tree, shrub, herb, grass or other plant or part thereof, whether living or dead;
- (c) post, stick, stamp, stencil, paint, draw or otherwise affix any mark, lettering, notice, advertisement, sign or document of any description, or have in his possession on any nature reserve or wildlife sanctuary any material of any description capable of being used for such purposes;
- (d) cut or make any tracks, landing strip or parking area, jetty, mooring, resting or launching area for any vehicle, vessel, aeroplane, helicopter or hovercraft, or use, operate or park such a vehicle, vessel, aeroplane, helicopter or hovercraft other than in a place lawfully set aside for that purpose;
- (e) interfere in any manner with the water level or water supply in any nature reserve or wildlife sanctuary including any lake, swamp, water-course, river, drainage flow, well, water hole, or dam, whether natural or artificial, or use any water therefrom;
- (f) sail, tow or operate any vessel of any description except in such part or parts lawfully set aside or reserved for that purpose;
- (g) drive, tow or operate any vehicle of any description except on a road or track lawfully set aside, reserved or provided for that purpose;
- (h) misconduct himself or indulge in any riotous or indecent conduct;
- (i) in any way disturb, interfere with, frighten, drive, molest or take any fauna or other animal, whether by noise or any other means, in or in the vicinity of any nature reserve or wildlife sanctuary;
- (j) take, carry, operate, fire or use any firearm, throw or discharge any missile or explosives, except that a licensed shotgun may be used on a game reserve in the manner prescribed in these regulations;
- (k) take, ride or drive, graze or agist any dog, cat, fox, horse, cattle, sheep, goat, camel, donkey, mule, pig, fowl, or other exotic bird or other animal, or suffer or allow any such exotic bird or animal to remain on any nature reserve or wildlife sanctuary;
- (l) cut, construct or maintain any private track, road, tramway, railway or other means of transport or communication, or lay any telephone line, electric light or power line, waterpipe line, gas pipe line, oil pipe line or carry out any other works or drain or clear or prepare any part of any nature reserve or wildlife sanctuary for any purpose;

- (m) light any fire, other than in an authorized fireplace, or burn or clear by any means whatsoever any tree, shrub, grass or other plant, whether living or dead;
- (n) introduce, place, drop, pour, spray, fog, mist or otherwise use or discharge any dangerous, poisonous or noxious substance;
- (o) do or take anything which may interfere in any manner with the natural environment; or
- (p) refuse to leave any nature reserve or wildlife sanctuary when so directed by any wildlife officer.

Prohibited Areas.

47. (1) For the purposes of these regulations "prohibited area" means any nature reserve or wildlife sanctuary or any part thereof classified as a prohibited area pursuant to the provisions of the Act. Amended
by G.G.
24/12/76,
p. 5057.

(2) Except as authorized by the Conservator of Wildlife, a person shall not enter in or upon any prohibited area.

(3) Every authority to enter a prohibited area shall be in Form 13 in Appendix A and shall set out—

- (a) the part or parts of any or all prohibited areas which the holder may enter;
- (b) the purpose for which the person may enter the prohibited area pursuant to the authority;
- (c) the duration of the authority; and
- (d) such other information as may be appropriate, including the conditions to which it is subject.

(4) A person shall not undertake any activity or do anything except as authorized pursuant to the authority issued to him and in pursuance of an approved scheme of management or working plan.

(5) A person authorized to enter a prohibited area shall not so enter in or upon such prohibited area by any means other than by foot or as such authority may otherwise authorize.

Limited Access Areas.

48. (1) For the purposes of these regulations "limited access area" means any nature reserve or wildlife sanctuary or part thereof classified as a limited access area pursuant to the provisions of the Act. Amended
by G.G.
24/12/76,
pp. 5057-8.

(2) A person shall not enter upon or into any limited access area by any means other than by foot unless otherwise authorized in writing by the Conservator of Wildlife.

(3) A person shall not enter upon any limited access area during any part of any day or night except in accordance with the scheme of management for the area or as may be displayed on any authorized notice.

(4) The provisions of these regulations relating to prohibited areas and nature reserves and wildlife sanctuaries generally shall apply to limited access areas unless their context otherwise indicates.