PROCEEDINGS OF A WORKSHOP

ON

PRINCIPLES FOR DEVELOPING

A NATURE CONSERVATION RESERVE SYSTEM

HELD AT THE

DEPARTMENT OF CONSERVATON AND

LAND MANAGEMENT

COMO, WESTERN AUSTRALIA

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DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

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INTRODUCTION BY DR BARRY WILSON

Director For Nature Conservation, CALM

First, I want to say welcome and thank you for coming along here today to participate in this morning's workshop. Many of you will have attended the last workshop on Ecological Sustainability, which proved to be very successful in clarifying issues and putting forward directions for CALM's activities.

This morning's workshop is the second in the series of workshops and seminars which we are planning to hold in order to assist and guide us as we review our nature conservation and forest strategies.

In introducing this workshop I would like to go back and look at some of the things happening around the world today in the field of nature conservation. The Brundtland Report and other recent major initiatives have stimulated a great deal of activity and focused world attention on nature conservation issues. It helps us put our endeavours into context when we consider that the issues we are confronting in our workshop today, and as we draw together a Nature Conservation Strategy for this State, are probably being discussed in seminar rooms around the world. The issues are common issues, and human beings around the world are drawing similar conclusions. We are part of, and contributing to, this process and I would like to believe that our thinking is up front, or in some cases ahead.

At a national level, the Commonwealth Government is involved in the same issues. The Commonwealth Government's sustainable development report and biodiversity inquiry are currently underway. Australia may become an international signatory on biodiversity next year. These are the contexts of our workshop. They are international issues, but they are also grass roots issues. We must ensure that our debates relate directly to these "hands on" issues in the bush. We must not become too removed from the "paddocks".

We decided a few months ago that it would be a good idea for CALM to draw together all the policies and papers it has developed over the last five to six years. But once we looked at it we realised that we have actually come a long way and the policy statements that we have represent a good overview and comprehensive approach to conservation. We felt we were at the stage where we could take them one step further and present them as part of a philosophical document for the public to be involved in.

The Nature Conservation Strategy has a number of different contexts:

- the Wildlife Conservation Act;
- the reserve system (developed through the Conservation Through Reserves Committee-CTRC-process);
- off-reserve conservation.

The reserve system is the firm base around which the other conservation programmes relate. Our objective now is to develop a Strategy to guide us in the future. Getting a good reserve system is part of that objective. We have a good reserve system now. Some may say that it is not adequate, however, we cannot lose sight of its primary importance. We are here today to discuss the principles upon which it should be based. Once again I thank you for your involvement today and I look forward to the outcome of this workshop.

WORKSHOP OBJECTIVES

The workshop's objectives were outlined by Sue Moore (Workshop Facilitator), as follows:

1 To develop a set of principles for reserve system design.

2 To develop strategies or ways of achieving these principles.

3 To obtain assistance from members of CALM and the public in developing these principles and strategies.

PRINCIPLES FOR DEVELOPING A NATURE CONSERVATION RESERVE SYSTEM

A Talk by Dr Andrew Burbidge

Director of Research, CALM

Why Do We Need a Nature Conservation Reserve System?

In simple terms, reservation is the best (but not the only) technique for conserving intact ecosystems. Most indigenous species cannot survive outside intact or near-intact ecosystems.

We only have to look at the wheatbelt of Western Australia, where clearing of woodland, mallees and heaths has led to the total or local extinction of many taxa. Well over 50 species that were described by early botanists, and probably many others that were not known, are now extinct.

Another question we may ask is why do we need nature conservation reserves outside the main developed areas, for example in deserts and pastoral areas? This is simply because we need to conserve biodiversity before development, so that development can proceed hand in hand with biodiversity conservation.

Therefore, we need to reserve well before intensive land use. But we also need to manage those reserves to prevent loss of biodiversity, even in apparently unchanged ecosystems. For example, we have lost one third of our native mammal species in the desert areas due to foxes, feral cats and changed fire regimes.

People's ideas of why we should reserve have changed over the years. For example, our definition of biodiversity differs from that being put forward in the early 1970s.

The Man and Biosphere Taskforce (UNESCO 1974) summarised the purpose of conservation reserves as "To conserve for present and future use the diversity and integrity of biotic communities of plants and animals within natural ecosystems, and to safeguard the genetic diversity of species on which their continuing evolution depends." Reserves need to protect both representative and special areas.

History of Nature Conservation Reservation in WA

Pre-1960

Before 1960, most reservation was based on the knowledge of individuals who had the foresight to push for the setting aside of reserves through Government boards or committees such as the National Parks Board and the Fauna Protection Advisory Committee. However, reservation was not done on a systematic basis. The most successful person in having large reserves

declared at this time was Government Botanist C. A. Gardner, who was responsible for the reservation of the Cape Arid, Fitzgerald River and Kalbarri National Parks, and the Jilbadji Nature Reserve.

However, most of the nature reserves declared prior to 1961 were smaller than 1000 hectares and had been set aside by the then Department of Lands and Surveys for reasons of soil conservation, aesthetics or recreation, or from subdivisions of agricultural land.

Australian Academy of Science (1962 - 1972)

In its 1962 report on National Parks and Nature Reserves in W.A., the W.A. sub-committee of the Australian Academy of Science Committee on National Parks made the first systematic review of the adequacy of the State's nature conservation reserve system.

The recommendations of the report caused many conflicts over land allocation, but were partially implemented over the following decade. Some of our largest and most spectacular reserves were declared following recommendations in this report. The Prince Regent Nature Reserve, Hamersley Range National Park, Barlee Range National Park, Queen Victoria Spring Nature Reserve, Great Victoria Desert Nature Reserve and Drysdale River National Park are good examples.

Conservation Through Reserves Committee (1972 - 1983)

In 1972, the Environmental Protection Authority established the Conservation Through Reserves Committee (CTRC) to "review and update the 1962 recommendations of a sub-committee of the Australian Academy of Science (WA) with respect to National Parks and Nature Reserves of the State". The CTRC divided the State into 12 "systems", and made the first of its series of "Systems" reports in 1974. Progress of implementation of CTRC "Red Book" recommendations is shown in the following table:

RED BOOK RECOMMENDATIONS

System	% Implemented
1	53
2	74
3	74
4	88
5	54
6 Metro	28
6 Country	21
7	14
8	68
9	49
10	75
11	75
12	59

Reserves created as a result of the CTRC process include the Shannon River, D'Entrecasteaux and Rudall River National Parks, the Gibson Desert Nature Reserve, etc.

Forest MPAs

At the same time as the CTRC work was being carried out, the Forests Department was developing and setting aside a system of Management Priority Areas (MPAs) in the State Forest. Some of these areas are now within national parks; others are currently being declared conservation parks.

Regional Surveys

Detailed biogeographical surveys were also being carried out by Government Departments and instrumentalities, such as the Department of Fisheries and Wildlife, the WA Museum, and the WA Herbarium (then within the Department of Agriculture). Some important reserves in the Eastern Goldfields resulted from these surveys.

CALM Regional Plans

Nowadays, the main thrust for reservation is through CALM's Regional Plans which are being progressively produced to assess current reserve adequacy and identify opportunities for reservation.

Regional Plans have been completed for the three forest regions and the South Coast, and one is in preparation for the Goldfields. CALM has also carried out a review of the System 7 (Kimberley) recommendations, as part of the Kimberley Region Planning Study.

Reserve Selection

Prior to the 1960s, there were very few broadscale biological survey data bases or environmental maps on which to base reservation. Now we have excellent maps available, for example, surface geology for the whole State at 1:250 000 and vegetation maps (John Beard's work) for the whole State at 1:1 000 000.

How Successful Have We Been?

The current percentage of the State reserved for conservation is around 7% (see Figure 1).

This percentage does not indicate how representative the system is, or its spread. Much of it is in remote parts of the State.

From the statistics given above on the percentage of Red Book recommendations implemented, it is clear that there is still some way to go. Anyone can see the major gaps in the reserve system, particularly in the Gascoyne/Murchison region, the Great Sandy Desert, the Kimberley and even in the South West, e.g. at Lesueur.

Even when the currently proposed system of reserves is implemented, there will still need to be continual refinement as our knowledge of Western Australia's environment becomes more complete.

In summary, there are four principles for developing a reserve system:

1. Special: - we need to protect the special areas.
2. Representativeness: - we need to represent biodiversity.
3. Viable: - reserves need to be viable.
4. Management: - we must manage reserves.

ENHANCING THE CONSERVATION RESERVE SYSTEM

A talk by Dr Ken Atkins,
Senior Botanist, CALM

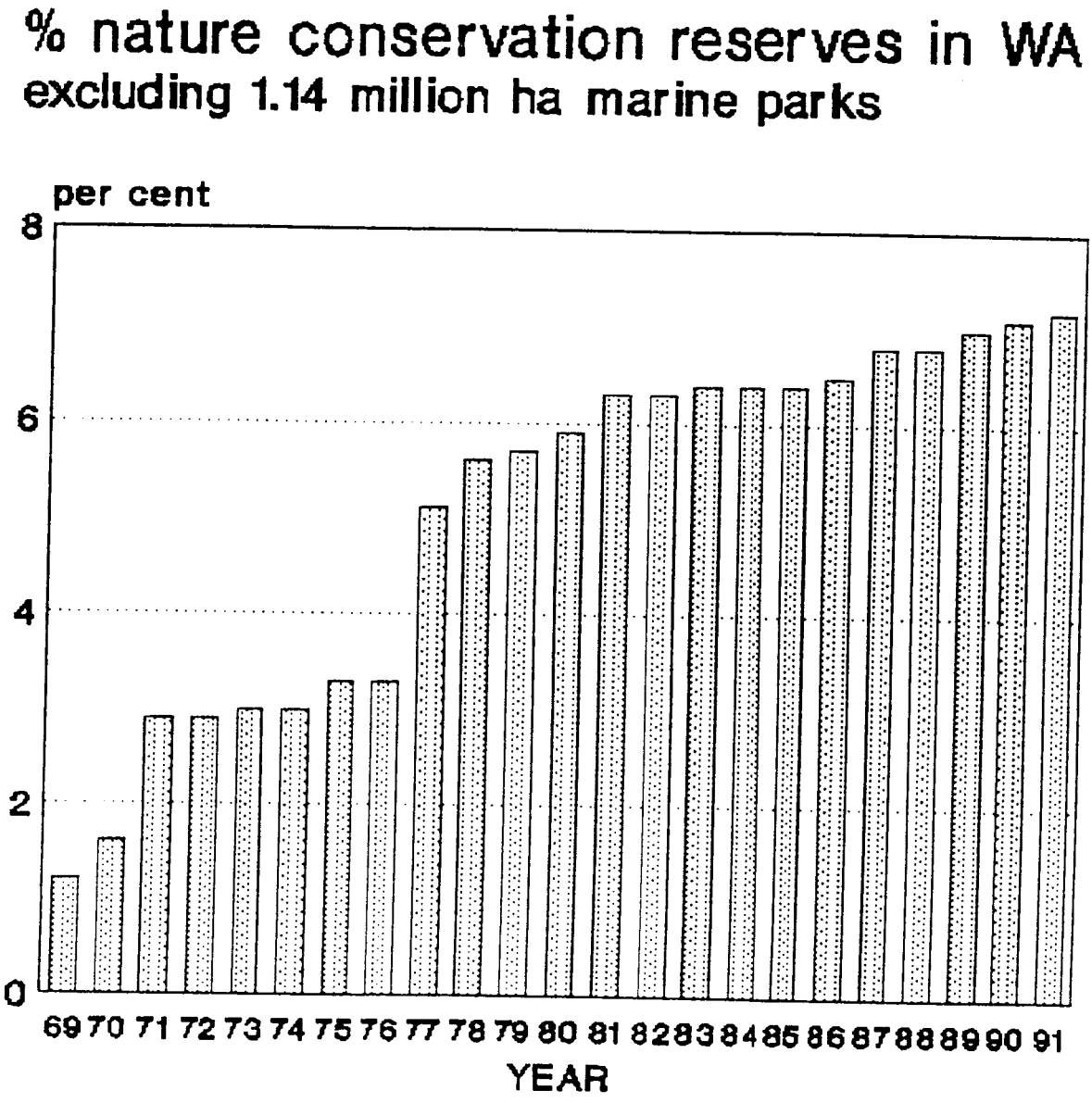
The integral objective of any nature conservation strategy is the preservation of the genetic diversity found in the organisms of the area for which the strategy is being applied. Inherent in this objective is the need to maintain the biological diversity in natural ecosystems.

In addition to the need to conserve individual species or taxa, and a representative example of each ecosystem, there is also a need to conserve replicas of populations and ecosystems. Apart from providing a buffer against catastrophic destruction of an area, this also provides different environmental conditions that may result in variations in evolutionary processes, thus enhancing the options for biodiversity in the future.

Strategies for achieving this objective include the maintenance of areas of land and water set aside for the conservation of nature. On a regional or State basis, such a strategy involves the maintenance of a conservation reserve system, composed primarily of terrestrial and marine national parks and nature reserves.

The current nature conservation reserve system in Western Australia does not appear to be achieving this objective.

Figure 1


% nature conservation reserves in WA
excluding 1.14 million ha marine parks
per cent
8
6
4
2
0
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91
YEAR

Forty percent of declared rare flora is not represented at all on conservation reserves, and nearly the same proportion is the case with the priority flora. Ecosystems have not been analysed in this manner and so their representation is not known.

The current system of conservation reserves in Western Australia is a reflection of the European history of the State.

In a broad sense, we have discrete national parks covering some of the more outstanding areas of landform and biological diversity and a system of nature reserves scattered across the State.

In the earlier period of settlement of the State, national parks were the main areas reserved, but this was as much for the landscape features as for conservation. During the early settlement of the Swan Coastal Plain and western wheatbelt, nature conservation was generally not considered, with the result being widespread clearing for urban development and agriculture leaving only small remnants of bush that was either unsuitable for those purposes, or reserved for other purposes such as stock routes or townsites. The consequence of this is that while many nature reserves now exist in these areas, they tend to be of small size and not necessarily representative of the regional ecosystems.

The main exceptions to this generalization are those important areas that were originaly reserved for timber in the western wheatbelt (e.g. Tutanning, Boyagin and the Dongolocking Nature Reserves and Dryandra State Forest).

As agricultural development extended into the drier areas of the State, an awareness of conservation was also developing, and larger, more representative nature reserves were set aside (e.g. Lake Magenta, Dragon Rocks and Lake Campion). Large reserves were also created on the edge of the agricultural zone (e.g. Jilbadji and Karroun Hill) and scattered through the goldfields and deserts, but not in the main pastoral areas.

Concurrent with the upsurge in conservation interest and the creation of nature reserves, was the creation of wider road reserves in the outer wheatbelt areas. This initiative came in the early 1960's, principally for tourism, but these wide road reserves also provide bush remnants across the developed landscapes, that are valuable as representative areas of vegetation, and as wildlife corridors.

The existing network of parks and reserves includes many ecosystems. However, with less than 6% of the area of Australia being included in these reserves, much of the natural vegetation is present outside the conservation reserve system, with (as demonstrated in the Western Australian context) specific regions having less conservation reservation than others. Many existing habitats and species are thus either poorly conserved, or not represented at all in the current reserve system, yet are found on other lands.

Discrete terrestrial parks, reserves and vegetation remnants may also be isolated from each other, especially in the older settled areas where narrow road reserves are now often degraded. Native vegetation corridors are required for the movement of some of the biota between vegetation remnants and are thus integral to the long-term maintenance of biodiversity in a region. These corridors are usually on lands not in the conservation reserve system, but are necessary to create the nature conservation network.

A nature conservation strategy thus needs to consider those areas not currently incorporated into the formal conservation reserve system if it is to address the desired objective of ensuring the maintenance of biodiversity. One strategy for this would be to identify areas of land or waters that contain habitats or species required to complement the existing conservation reserve system, and those corridor connections required to make the system into an interconnected nature conservation network.

Areas that are identified as being desirable for inclusion into the conservation reserve system may, however, not be able to be included due to a variety of reasons such as the expense, community opposition, unsuitability for management as a reserve, or the requirement to retain the existing purpose. As a consequence, the ongoing maintenance of these areas for the conservation of the species, or habitats/ ecosystems is dependant on their management being compatible with nature conservation while being retained outside of the conservation reserve system.

Examples of this includes other Crown reserves that are managed (e.g. for water, timber, or road and rail reserves), or unmanaged (e.g. stock routes, undeveloped townsites, or anciliary reserves), the pastoral country, farm remnants, and other undeveloped private land (e.g. urban bush areas).

Many of the natural areas required for creating the nature conservation network are on lands which are being managed for other purposes, often in apparent conflict with nature conservation. It is possible however, to combine land management practices to provide benefits to the primary land use, and to nature conservation. Examples of this are: soil conservation strategies on agricultural land (such as stock shelter belts, windbreaks, and erosion and salinity control); aesthetic maintenance along roadsides; and areas for public appreciation in urbanised landscapes. The achievement of these compatible land uses may involve the restoration of degraded lands as well as the protection and management of existing vegetation.

In addition to such examples of linking nature conservation with divergent land uses is the relationship with more compatible land uses, such as water conservation on lands reserved for that purpose.

Private landholders and other agencies that manage natural land with primary purposes other than nature conservation thus have a role in extending the nature conservation land network beyond the formal reserve system, but often require management advice and financial assistance.

For nature conservation to be considered as a land use option on lands outside the conservation reserve system, it is necessary for the land manager to be convinced that following such a course will not be detrimental to the primary purpose, and even for it to provide a positive benefit. It is up to the conservation agencies, both government and non-government, to provide the information necessary to establish this understanding, as well as the management advice necessary to carry it out within a framework of appropriate government policies and incentives.

When assistance, either advisory or financial, is given by nature conservation agencies to external land managers, the benefits to nature conservation extend beyond the immediate effect. Once a nature conservation ethic is established, or

a program commenced, the flow-on effect within the other agency or local community has a multiplier effect to the initial input. Such a result is to be fostered if we are to succeed with conserving nature.

WORKSHOP SESSION - OUTPUT FROM GROUPS

Four workshop groups were formed to consider the following:

- scientific principles for developing a nature conservation reserve system;
- strategies for achieving those objectives.

The four principles for developing a reserve system given in Dr Burbidge's talk -

- special
- representative
- viable
- management

were used as a basis for group discussion. Group 1 added another principle to its discussion -

- community.

Group 1

1. Special Values

The Group noted that many special areas are already nominated for reservation, for example through the Conservation Through Reserves Committee (CTRC) reports. However, there is little or no feedback to the community about the progress of implementation of these reports. The community needs to be informed. It was noted that many special System 6 areas have already been lost.

Areas were "special" because of their:

- Vulnerability - e.g. coastal areas
- Diversity
- Rare species or communities
- Landscapes
- High community values
- Or as a "last example"

2. Representative

Using a percentage of a State or political area to gauge representativeness is meaningless. A percentage of biological systems may be more meaningful. But what percentage, and is it useful?

A reserve system should be "representative" at the species, community, local and regional level.

Principles:

Reserves should be located -

- across environmental gradients,
- take into account climate change,
- to represent biogeographic units (there is a question of resolution in "units").

The importance of replication of reserve types was also noted.

3. Viability

This had to take account of:

- Scale, for example -
  - the community level;
  - the species level.

Corridors and remnants add to the viability of other areas.

- Key processes
  - . biological
  - . physical
- Adjacent land uses

The following principles were identified:

1. Special

. Implement existing recommendations for reserves, e.g from the CTRC/System 6 Red Book reports.
. Review adequacy of recommendations.
. All land use decisions need survey - conservation action.
. Do not devote all resources to special development surveys.
. Fill in assumed well known areas - many are not really well known.

2. Representative

. Implement existing recommendations, e.g. CTRC etc.
. Review adequacy of reserves.
. All land use decisions need survey - conservation action.
. Do not devote all resources to special development surveys.
. Surveys should be on biogeographical areas, not artificially circumscribed areas.
. Fill in assumed well known areas - many are not really well known.

3. Viable

. Sympathetic management of surrounding lands/buffers.
. Area/shape.
. Research.

4. Management - Objectives

. A range of strategies must be developed for land reserved for conservation, for leasehold land and for private property.
. Research.

5. Community

. Need for information and education:
  - the community must be involved in management
  - there must be involvement of managers.

Group 2

Principles

Principles for reservation should be based on objective science. However, pragmatic influences come to bear and politics, public opinion, funding, and competing land uses all influence the success of the nature reserve system.

Strategies

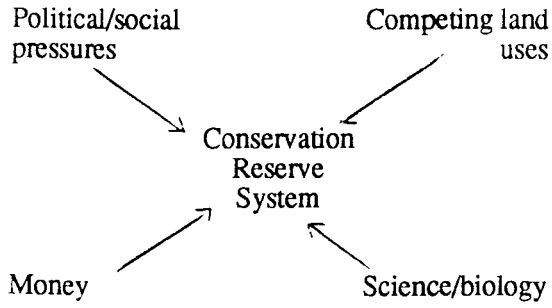
1 Maximise the percentage of our remaining natural areas that are under committed conservation status/ management. E.g. maximise size of reserves. Start with our largest remaining undisturbed/wilderness areas.

2. Maximise the conservation management of all other lands.

3. Minimise disruptive/ degrading activities on ALL lands, especially areas of high naturalness/wilderness value or those having special features/ species.

4. Community awareness and education.

The Group used the following diagram to illustrate their points:



Tactics to Implement Broad Strategies:

1 Consider adjoining land use.
2 Special (restricted/ rare species or landforms).
3 Representativeness.
4 Viability of ecosystem:

- management ability
- key species
- understanding ecological processes
- understanding disturbing processes
- enhance by management of surrounding land.

Features of Viability:

. habitat heterogeneity (variable ecosystems);
. territory requirements, e.g size, food availability;
. potential for rehabilitation.

Strategies to Achieve Viability in Fragmented Areas:

. must enhance by managing surrounding land, e.g. -

- revegetation
- corridor development
- feral animal control.

Features of Representativeness:

. difficult to identify how representative an area is;
. certain assumptions inherent in this method;
. computer modelling a valuable tool.

Strategies to Ensure Representativeness:

. select for habitat variety;
. identify the landform and historical characteristics of the species present. Look for those species in similar areas.

Group 3

Principles

This Group concentrated on principles for a total reserve system, having two parts:

- representative areas;
- special purpose areas.

1 Design strategy does not depend upon current management abilities.

2 Representative reserve planning requires comprehensive biophysical geographies, inventories and maps.

3 Geomorphic - botanical systems/provinces have been mapped widely (not everywhere, e.g. deserts) and this material provides the best available overview for representative planning.

Strategies

1 Assess representativeness of existing conservation estate - use inventory of systems/provinces (scale of 1 : 1 000 000 or 1 : 250 000). Having done this you have to:

(a) establish criteria for biogeographical representativeness of each.

(b) assess adequacy of reservation and the criteria used.

(c) review rare, endangered and "special" biota - their occurrence/status in relation to the biogeographical systems maps and processes (b).

(d) assess need for extra "special" reservations.

(e) education of community for required support.

Group 4

Scientific principles to maintain diversity:

1 Representativeness - complete representation

- replication of reserve types
- scale
- time/knowledge

2 Special values (will be defined by the community): e.g.

- landscape features
- specific biota

3 Viability: aiming to self-perpetuate the ecosystem. Need to consider:

- ecosystem processes
- population size
- genetic diversity

4 Management

- protective
- habitat
- design - shape
- natural boundaries
- planning
- resources for protection

Strategies:

Representative

1 Need resource data base

. Ecological/ biogeographic (genetic, species, habitat)
. Geology
. Alternative land use (e.g. recreation, water, production)
. Social/cultural

Special values

1 As per above. Increased emphasis on social/ cultural. Need to take into account acid rain, climate change, pollution.

Viability

1 Optimise population size/area.

2 Understanding of species/population requirements.

3 External influences.

Management

1 Perceived versus actual. (Once an area becomes a reserve, management expectations are greatly increased.)

2 Community acceptance through education and understanding.

3 Resources.

Constraints:

1 Conflicting land uses

- to be considered after initial information collection and assessment phase;
- generation of reservation options;
- community values.

2 Resources.

3 Aboriginal considerations.

4 Politics and public perceptions.

5 Community needs.

SUMMARY OF PRINCIPLES AND STRATEGIES IDENTIFIED

In the following summaries, points are numbered for ease of reading, not to imply an allocated priority.

SUMMARY OF PRINCIPLES

Representative

1 Reserves should be located across environmental gradients, take into account climatic change and represent biogeographic units.

2 A reserve system should be "representative" at the species, community, local and regional level.

3 Reserve types should be replicated.

4 As much as possible of remaining natural areas should be added to the conservation reserve system.

Special Values

5 Areas can be regarded as special if they are vulnerable (e.g. coasts, wetlands), have a high species diversity, or have rare species, communities or landscapes.

Viability

6 Determination of viability is based on ecosystem processes, population size, territory requirements and genetic diversity considerations.

7 Viability can be assessed on a community or species basis. In both instances, an understanding of scale is essential.

Management

8 Design strategy must not be influenced by current management abilities and must be based on objective science.

9 All lands should have conservation as a primary management component.

10 Activities disruptive or disturbing to conservation should be minimised on all lands, particularly those with special conservation values.

11 Management requirements should influence reserve selection and design (e.g. an area with a small perimiter: area ration is easier to manage and more likely to remain a viable conservation area in the long term).

SUMMARY OF STRATEGIES

Representative

1 Implement existing CTRC recommendations.

2 Review adequacy of existing conservation estate by:

a using existing information at 1:1 000 000 TO 1:250 000 scales - e.g. geology, vegetation;

b establish criteria for the "biogeographic representativeness" of each;

c assess adequacy of reservation;

d review the reserve status of rare, endangered and "special" biota in relation to the biogeographic system maps and processes;

e assess need for extra reserves;

f education of community for required support.

3 Reserve areas with highly variable habitat to protect the greatest diversity of organisms.

4 Determine the habitat requirements of species of interest and reserve areas with similar habitats.

5 Establish a resource data base including biogeographic, genetic, species, habitat, alternative land use (e.g. recreation, water/timber

production) and other social and cultural information.

Special values

6 Include special values in the resource data base (Strategy 5), with an increased emphasis on social and cultural values.

7 Base all land use decisions on biological surveys.

Viability

8 Ensure management of areas surrounding conservation reserves is sympathetic and complements the conservation values of the reserves. Revegetation, corridor development and feral animal control on surrounding lands are examples.

9 Select the most "viable" area and shape, where possible, for conservation reserves.

10 Obtain a greater understanding of key species, ecological processes and "disturbing" processes.

11 Manage conservation reserves to obtain "optimum" population size per area.

Management

12 Determine and provide adequate resources for management of conservation reserve system.

13 Develop strategies for management of conservation values on leasehold and private properties.

14 Do not devote all resources to development-orientated surveys.

Community

15 Develop community acceptance through education and understanding.

16 Involve community in management.

17 Provide feedback to community on progress towards implementation of CTRC recommendations.

CONSTRAINTS

One workshop group listed constraints to the achievement of an adequate reserve system. These were:

- conflicting land uses
- conflicting community values
- lack of research, planning and management resources
- Aboriginal considerations
- public perceptions and politics
- community needs.

LIST OF PARTICIPANTS

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