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Department of Agriculture, Western Australia

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Conservation of the national estate

By Officers of the Department of Agriculture

In 1973 the Australian Government established a Committee of Inquiry under Mr. Justice R. M. Hope to inquire into the National Estate. Under its terms of reference the Committee was to assess the nature and condition of the National Estate and the measures which were being and should be taken for its preservation and enhancement.

Officers of the Department of Agriculture recognise that there are basic natural resources such as land, water, gene material and ecosystems which are essential elements of the National Estate held in trust by successive generations. In a submission to the Inquiry, matters of particular concern to the Department of Agriculture and of relevance to the National Estate were discussed. The submission is printed here in condensed form.

CONSERVATION OF BASIC RESOURCES

There are important reasons for the preservation of virgin land as such for the benefit of agriculture and pastoralism. Although the Department of Agriculture aims at total welfare rather than only material prosperity for Western Australians, it is more appropriate for other organisations to argue the cases for the preservation of virgin land for purposes such as fauna conservation, recreation and aesthetics.

Ecosystems and gene material

Concern is being expressed worldwide at the rate at which natural ecosystems are being destroyed and unique plants and animals lost. Natural ecosystems provide vital raw material for plant and animal breeding programmes and research into biological methods of pest control. Cotton crops on the Ord irrigation project have encountered major insect problems due to the existence of cotton-related plants and their pests in the natural environment. Natural predators in the area, whether animals, birds or other insects, may be useful in control programmes.

There is little work at present on the possibility of using natural West Australian plants or animals as crops. In other countries, however, important new crops producing drugs, foods and industrial raw materials are being developed. The value of native species for timber and honey production is well known, and there is no reason to suppose many other valuable products will not be developed.

Soil

Soil resources, a vital, irreplaceable and easily damaged part of the National Estate, are the basis of primary industries, such as agricul-
ture and forestry, and an essential asset in national parks, nature reserves and urban areas.

Disturbance of soils for agriculture, mining, prospecting, urban development and industry has resulted in many examples of serious soil erosion, in some cases over vast areas. An unusual but important side effect of development has been the encroachment of salt into agricultural soils and into streams and wells.

The conservation of soil is achieved primarily through wise use based on careful evaluation of land use potential. Where damage has occurred, expensive time-consuming reclamation measures are required, and return to original condition may not be possible.

Water
As part of the natural resource base of the National Estate, the water resources of the State should be used and managed in such a way as to preserve their supply and quality for future generations.

Many uses, such as industry, home gardens, livestock, wildlife, irrigation, recreation and agriculture, compete for the State's extremely limited water resources and differ in efficiency of water use.

Careful evaluation and rational use of water resources throughout the State is needed. As a specific example of alternative uses, the rationale and economics of the Comprehensive Water Supply Scheme can be considered. Under this scheme, water is piped from Darling Range reservoirs to the dry farming areas. Because water for livestock and domestic use is sometimes in very short supply in the cereal and sheep areas, there is constant political pressure for extensions to the Comprehensive Water Supply Scheme.

In the past, the Comprehensive Water Supply Scheme has been extended with little consideration given to the potential for development of on-farm water supplies in the areas served. Many of these areas have good potential for on-farm stock water supplies, based either on underground water or on excavated tanks (dams) with improved (roaded) catchments.

As the competition for water intensifies it will become increasingly desirable for all water sources to be used rationally and appropriately. In such an approach on-farm supplies, lakes, rock catchments, etc., are important links in the State's water resource network.

LAND USE PROBLEMS
Conflicts in land use
Since settlement by Europeans, the land area in W.A. has been apportioned to various uses as the needs of development and growth have directed. The use of land for agriculture has been actively encouraged as one way of contributing to the wealth and welfare of the State. Requirements have been attached to conditional purchases of Crown land for 50 per cent of the area of a purchase to be cleared, cultivated and sown by the end of the eleventh year and for it to be fenced. The minimum price for Crown land is 50c per hectare.

Encouragement of land use resulted in the allocation to pastoral lease of 109 million hectares (over two-fifths of the State) by 1922. Agricultural development was slower due to the inherent infertility of many soils and the low rainfall in most of the State. The area of land alienated or in process of alienation has, however, risen rapidly in recent years and at June 30, 1972, stood at 19 538 446 hectares, most of which was used for agriculture in the south-west of the State.

Agriculture and pastoralism have tended to dominate other potential uses such as fauna and flora conservation and recreation on areas of land well suited to them. Survival of any remnants of pastoral ecosystems in a pristine condition is rare and fortuitous. Agriculture has similarly tended to 'take all before it' with the result that there are no large areas of virgin agricultural land reserved in the central wheat-belt. Even the small areas which have been excluded from agricultural use are under constant pressure for release and in many cases become sites for rubbish dumps, air strips and other facilities.

Because of the aridity and infertility of large areas of the State, there are still 92 201 426 hectares not allocated to any particular use. Most of this land is of no use on present knowledge for agriculture or pastoralism and is already represented in large reserves, although the security of some of the reserves is poor. The nature and distribution of the unallocated land in the State is such that it does not relieve the pressure on the land resources in the settled areas.

In the agricultural areas, and to a lesser extent in the pastoral areas, virgin land has become a rare resource. It is therefore important to
question whether land uses which do not need to be located on virgin land should be relocated on agricultural land. Examples of such uses include town s.tes, public facilities, service corridors, rubbish dumps, air fields, and recreation grounds. In many cases country towns use virgin land for these purposes when poor quality agricultural land could be bought or leased and serve as well or better.

Close to Perth the situation is different and urban areas threaten to extend over prime agricultural land such as the Swan Valley vineyards and the market garden areas.

Land use and management conflicts also occur in the catchment areas of metropolitan and irrigation water reservoirs. Effects of mining, forestry, burning and agriculture on water yield and quality, and the financial effects of water harvesting on management of the resource need to be considered.

The operations of the market, unfortunately, take no account of land values which are not immediately recognisable in dollar terms. Agriculture cannot compete with housing and wildflowers cannot compete with agriculture in economic terms unless a case can be made for preferential land use.

To ensure that the State's land resources are used in the best long-term interests of the people, a much closer evaluation of the relative merits of conflicting uses is required than in the past. The evaluation should not only take into account the suitability of the specific land for the proposed use but also—

- The influence of the proposed use on other areas (e.g., flooding, salt).
- Whether the land type is well represented in large secure reserves in the region.
- The potential of the land for other uses, especially those of a non-economic nature.

To implement recommendations resulting from the evaluation, a range of measures including Government purchase of land, Government purchase of development rights, creation of agricultural or other preserves, tax concessions and bonuses should be used.

**Land and water use conflicts**

Historically, water has played a vital role in the development of W.A. About the turn of the century salinity problems were encountered by the Railways Department following tree ringbarking to increase water yield. Since then the problem of soil and water salinity has increased to the point where about a quarter million hectares of previously non-saline soil is now saline and rivers such as the Avon, Murray and Blackwood are too salty for general use.

Of the water supplies available in the south-west of the State, 30 per cent are too brackish for domestic use and 11 per cent marginal.

Stream salinity changes have occurred due to clearing the catchments for agriculture and other purposes. In order to avoid salinity increase, appreciable areas of previously alienated and cleared land in the catchment of Mundaring Weir, a major metropolitan and Kalgoorlie supply, have been purchased and re-vegetated. Land alienation in other catchments has been stopped and extreme concern is expressed for Wellington Dam because the proportion of cleared land in the catchment has risen from about 6 per cent in 1951 to 21 per cent in 1973.

Bauxite mining, forest felling for woodchips and forest clearing for pine planting are all possible causes of stream salting. In particular the Warren River, a major south-west water resource, is of marginal salinity for domestic use and may be threatened by changes such as increased clearing for agriculture and increased forest cutting for woodchips.

Land use conflicts affecting water supply include the increasing demand for outdoor recreation areas. Most of the forest close to the metropolitan area is in declared catchment areas in which recreation is actively discouraged by water authorities. The same areas are subject to bauxite mining leases, although apiarists are not permitted to camp overnight while attending to their hives.

Conservation of flora and fauna could be in some cases threatened by water resource development.

Over-pumping of underground reserves on the Swan Coastal Plain for metropolitan water supplies could cause drying up of coastal lakes, and damming of rivers in the Darling Range may have contributed to a deterioration in the environment of estuaries such as Peel Inlet.

On present growth rates, predictions by Perth water authorities indicate that in the late 1980's demand will exceed locally available supplies. Unless demand slackens, water will then have to be drawn either from reservoirs at present being used for irrigation or from sources at a much greater distance in the south-west. Reduction in Perth's growth rate would reduce the pressure on water supplies as well as on recreation resources and the metropolitan environment generally. The reduction could possibly be achieved by fostering development of another metropolitan where water supplies are available.

While on-farm water resources can be developed in the agricultural areas, no such alternative is available for developments such as the nickel smelter near Kalgoorlie which is supplied from highly committed water sources near Perth.

Conflicts between land and water use are not confined to the more populated south-west of the State. At Carnarvon the expansion of the town to cater for tourism, the communications station and the salt industry is placing an increasing strain on the water resources in the river sand which are vital for irrigated agriculture. In the Kimberley region, abuse of the land by grazing in the past led to severe erosion and necessitated the cancellation of leases and the expenditure of over a million dollars for re-vegetation of the Ord River catchment.

**Establishing land and water priorities**

Fortunately the shortage of water in W.A. and the delicate balance of salinity in the landscape have forced an awareness of water problems and resulted in the establishment of a number of studies and working committees. Under the general programme of the Australian Water Re-
sources Council, a comprehensive stream gauging and sampling network has been set up throughout the State. The Department of Agriculture is engaged in a study of on-farm water supplies and the future needs for irrigation water. The Mines Department has prepared a report on underground water resources in the State. These studies are co-ordinated by the Committee for Review of Water Needs and the Farm Water Supply Advisory Committee. The general situation has been reviewed by the Public Works Department in its publication “Useable Water Resources in W.A.”.

Problems of water quality are reviewed in general terms by the Advisory Committee on Purity of Water and more specifically by the Darling Range Committee, and working groups on Water Salinity and Land Use and Water Quality monitoring in the Manjimup Woodchip Licence Area. The committees and working groups include representatives of various State departments and, in some cases, CSIRO.

A great deal of co-operative work is done by the groups mentioned above, and by individual organisations. Because of the time lag between land use changes and salinity changes, many of the studies undertaken are long term or are designed to register changes as they occur. The most effective action to conserve the State’s water resources should, however, be preventive, and such action is likely to be in the field of adjusting land use.

Special land areas
Where areas of great scenic beauty are included in national parks, their special land use capabilities are recognised. Other areas such as coastal land make particular contributions to man’s welfare. The Department of Agriculture supports the concept that land especially suited to a particular use should be preserved for that use.

Wherever possible, areas of prime agricultural land should not be allocated to other uses. Alluvial soils provide an excellent example. They form the basis for the Ord River irrigation project, the Carnarvon irrigation area, Greenough Valley, Swan Valley vineyards, coastal plain irrigation areas and Preston Valley orchards.

Collecting water samples from a South-West stream to monitor possible effects of clearing on water salinity. Rising salinity caused by clearing on catchments is threatening some water storages.

Multiple use systems
As the competition for land increases, pressure may be relieved by encouraging multiple use. In Europe planners are urging the retention of agricultural areas close to urban centres because of their value for sightseeing, recreation and open-space relief. The use of the land by the farmers may be restricted to agriculture in the public benefit in

Test plots near Kambalda, where Western Mining Corporation and the Department of Agriculture are jointly seeking ways to re-vegetate mine tailings.
return for certain dispensations. Such arrangements can be renewable annually for 10 or 20-year terms. It has been recommended in Europe that intensive farming should be kept to the best lands, the poorer lands being used for diverse activities thereby strengthening the farm ecosystem. In Metropolitan Perth, playing fields, golf courses, riding and race tracks could be established on the relatively infertile and sometimes poorly drained soils of the Bassendean series. Areas of Karrakatta or Cottesloe series soils can be used for housing, horticulture and forest lots. Forest lots may be used also for recreation and open space.

**Coastal land**

Coastal lands are of immense value to the general public and the National Estate: they have a multitude of possible uses and are subject to misuse and over-use. Many of the uses conflict with one another and some conflicts involve the right of individuals as well as the public interest. State and Federal Government should take a leading role in assessing their value and resolving the conflicts.

Coastal land includes not only the sea-shore and adjacent beach, whether sandy or rocky, but also the land extending inland as a scenic backdrop to the beach.

The presence of the sea and the seashore makes coastal land unique amongst all the land classes on the continent. The sea has direct physical attributes such as wind, water, sand and salt spray which, together with more indirect attributes, have been termed landscape amenity values.

The Department of Agriculture is involved in many aspects of the use of coastal lands and could be involved in many others. Much of the involvement of departmental officers is with various types of misuse or over-use.

Misuse of coastal land may be very simply defined as any use carried out on the coast which does not require the unique attributes of the area and which could equally well serve the public interest if carried out on some other class of land away from the sea and sea-shore.

Using this definition, agriculture appears to be a clear case of misuse of this part of the National Estate. When engaged in without thought of the delicate and dynamic ecological balance between soil, climate and vegetation in coastal lands, damage, degradation and sometimes complete destruction of the coastal vegetation often follows. As well as loss of the botanical complex itself, soil erosion and destruction of the landscape may result.

Similarly, coastal land should usually not be used for many industrial and business activities. Even housing developments may be considered misuse of coastal land.

Use of coastal lands may reasonably be considered for those businesses and industries which modern technology cannot separate from the sea, together with those human activities which can take place only on the coast. The use of coastal land by these businesses and industries, such as shipping and fishing, should be planned so that damage, degradation and destruction of the environment is kept to a minimum.

At various times in the past, suggestions have been made that coastal lands be resumed for National Parks, prohibited for mining, reserved for recreation, etc.

Land capability mapping of the multitude of different coastal land forms followed by delineation based on land form is the only logical way of determining the areas concerned. Although it would be extremely difficult and costly to alter the existing use of already intensively developed areas, there is still time to assess the capability of the remaining coastal land and plan for its proper use in accordance with the assessment.
Pastoral areas

The Department of Agriculture is concerned with extension (education) and research in the pastoral areas of Western Australia. Its area of involvement extends from North Kimberley to Eucla and Kalgoorlie.

The area of pastoral properties is approximately 855,000 square kilometres, over one-third of the State, principally situated in an area receiving less than 250 mm of annual rainfall, all of it capricious in incidence.

This area consists of natural grazing land ranging from tropical grasslands and woodlands in the north to steppe shrublands in the south. The pastures are an intensely complex mosaic of vegetation types generally in delicate balance with an arid environment. The arrival of European man and his grazing animals has, in many cases, affected the balance to the detriment of the vegetation and soil resources.

The area is probably one of the largest examples of single type land use in Australia. Multiple use for mining, tourism and wildlife and flora preservation as well as grazing presents complex problems specific to the area.

In W.A., domestic stock have been depastured on this part of the National Estate since 1861. The development proceeded rapidly in Kimberley until about 1920, but was then characterised by a rapid fall in total numbers which has only been relieved by the opening up of new land and the development of additional grazing facilities. In the area south of Kimberley, sheep numbers rose to about 5 million in 1934 and then plunged dramatically and have since never returned to their former levels. This inability to maintain and improve production is in sharp contrast with the developments in the farming areas of Australia where production has been greatly enhanced.

Two surveys of range condition have been conducted in pastoral W.A. They have included 168,000 square kilometres of rangeland. The surveys have shown that some 15 to 20 per cent of the land is severely degraded and eroded and that a further 50 per cent is degraded with only minor erosion.

This reduction in the stability of the nation’s rangelands and loss of productivity has been shown to be the result of severe over-use and the adoption of incorrect grazing management practices. General observation leads to the belief that a similar situation applies in at least a further 259,000 square kilometres of the National Estate in Western Australia.

There is an urgent need to reverse the present trend of condition by changing land use patterns. A Commonwealth Working Party on Arid Ecosystems is gathering information on the status of Australian rangelands. Any evaluation of the condition of the National Estate must take account of the considerable and continuing deterioration in the nation’s rangeland resource.

The Department of Agriculture has no regulatory role in the administration of pastoral lands.

Severe gully on pastoral land. Big areas of rangeland in the National Estate are severely degraded or eroded