DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

POLICY STATEMENT NO. 29

CAPTIVE BREEDING AND CULTIVATION OF THREATENED SPECIES AND THEIR RE-ESTABLISHMENT OR TRANSLOCATION IN THE WILD

MAY 1991

1. OPERATIONAL OBJECTIVE

Where such measures are warranted, to prevent extinction of animals and plants in the wild by re-establishing or translocating captive-bred or cultivated populations.

2. DEFINITIONS

"Interim Wildlife Management Guidelines" means guidelines approved by the Director of Nature Conservation for the management and protection of threatened or harvested taxa where no full Wildlife Management Program has been prepared.

"Wildlife Management Program" means a publication produced by CALM providing detailed information and guidance for the management and protection of threatened or harvested species or groups of those species. Programs for threatened taxa are sometimes referred to as "Species Recovery Plans".

3. BACKGROUND

The Department of Conservation and Land Management has a statutory responsibility for the conservation and protection of flora and fauna. An essential part of this responsibility is to prevent the extinction of any native flora or fauna. This is a major concern because:

i) Western Australia has a flora that is exceptionally rich in localised and rare endemic species. Moreover, areas where threatened species are concentrated and most extinctions have occurred coincide predominantly with the cereal-growing regions and other areas where there has been extensive land clearing.

ii) Since European settlement in Western Australia, large declines and extinctions of species belonging to a few groups of animals, particularly medium sized mammals, have occurred and continue. Some species were previously widespread but now survive precariously in habitat remnants in the south-western forests, the wheatbelt, the north-west Kimberley and on off-shore islands.

In some instances (particularly amongst the mammals), the prevention of extinction may require the captive-breeding or cultivation of threatened species followed by re-introduction or translocation into areas where it was previously thought or known to exist. This type of management would be likely to involve collaborative programs with the Kings Park and Botanic Gardens or the Perth Zoological Gardens.

Apart from the statutory responsibilities of the Department to carry out research and management to prevent the extinction of native species, such activities have a very high profile (i.e. Numbat, Noisy Scrub-bird, Wongan Hills Triggerplant) and could

clearly, with public interest and involvement, aid the overall conservation of the State's flora and fauna.

Philosophical, scientific and economic arguments have all been used for and against the re-establishment or translocation of threatened species to prevent extinction in the wild. Re-introduction is always technically problematical, while captive-breeding or cultivation followed by re-introduction is expensive. Nevertheless, re-establishment and translocation programs have proved to be extremely successful in a number of cases.

Evolutionary theory indicates that most genetic variation (with the exception of rare variants) can be saved from relatively few individuals if group size is increased quickly. This suggests that, with the right management prescription, maintaining or restoring adequate levels of genetic variation in a wild population to ensure long-term evolution is a feasible option.

It has been proposed, without scientific support, that the re-establishment, translocation or genetic manipulation of a population in an area should not be considered even if it helps prevent extinction of a species in the wild, because this will probably result in a variant of the species (genetically or perhaps even morphologically) from that which was originally in the area concerned. However a species should not be considered as a category defined by a currently existing suite of characters; rather, it represents a lineage that shares a common evolutionary fate. There is therefore no reason why a species gene pool should not be manipulated if one can ensure that preservation of that threatened evolutionary lineage in the wild.

Practical difficulties which need to be considered are:

i) Detailed ecological, life history and genetic information is essential if a suitable management program for preventing a species extinction in the wild is to be successful. Research time and costs must be carefully considered in the development of any threatened species management plan.

ii) Captive breeding or cultivation of threatened species from limited source material is initially faced with the problem of avoiding the effects of inbreeding depression. This means that sufficiently large numbers of individuals, preferably from more than one population, will need to be maintained in captivity or cultivation if the difficulties posed by inbreeding are to be minimised. As a result, the costs of facilities and personnel required for the maintenance of adequate numbers of individuals will also need to be accounted for.

iii) Some evolutionary genetic studies indicate that genetic management of a species, aimed at increasing genetic variability in a depauperate population can be detrimental rather than beneficial. Introduction of individuals into the target population from another source may result in the phenomenon of outbreeding depression, a reduction in fitness (viability, fecundity etc.) following interbreeding of different populations. This indicates a potential problem with re-introduction programs if the newly established population consists of individuals originally from two or more different populations. Clearly such an effect would need to be fully investigated before any re-establishment or translocation program could be considered.

Collaboration between CALM and Kings Park and Botanic Garden in Cultivation programs

Kings Park has both the expertise and facilities for the propagation of threatened plant material (including tissue culture techniques). In conjunction with CALM nurseries, sufficient numbers of plants could be cultivated for most re-introduction programs. Kings Park has also recently established a rare plant garden and hopes to be able to display most of the State's Declared Flora.

Although they have excellent propagating facilities, Kings Park will rely on CALM for much of the material (seed, cuttings, tissue culture material) necessary for the cultivation of a species prior to its re-establishment or translocation in the wild. Some seed or cutting material for certain rare and threatened species is presently available at Kings Park or from horticulturists in Perth. Most, however, would probably need to be collected by Departmental research or regional staff. Because of this it is proposed that, following the drawing up of a priority list, a program be developed for the systematic collection and storage of adequate genetic resources of all rare and threatened plant species and to ensure the availability of this material for any future propagation purposes. The bulk of the seed will need to be kept at the Departmental central seed store where there are excellent facilities, including cold storage.

Apart from the collection of propagation material, there are two major roles envisaged for the Department in any flora re-establishment or translocation program.

i) Research Division will need to provide the necessary ecological, life history and genetic information and produce a management program for the species concerned.

ii) Following re-establishment of plants in the wild, Departmental staff will need to monitor and maintain habitat quality in the re-introduction area.

Collaboration between CALM and Perth Zoological Gardens in Captive-breeding Programs

The initial research phase of a captive breeding program for animals needs to run for at least two or three breeding seasons before techniques can be recommended with confidence. In an annual breeding species this requires two or three years in which the animals will probably require daily attention.

To enable the maintenance of sufficient genetic variability amongst the captive group and to avoid inbreeding depression, significantly larger numbers of individuals (50) need to be kept than would normally be required by a zoo simply for display. No single genotype (i.e. that of a dominant male) should become over-represented. This requires the separation of individuals or the maintenance of a number of small groups, and may require a large amount of cage space.

Perth Zoo is involved on a large scale with maintaining and breeding fauna in captivity. It possesses resources for captive breeding including personnel for care and maintenance of animals, the infrastructure to support this activity, and the expertise for designing and building holding facilities. However, the Zoo lacks the research expertise required in developing captive breeding techniques for species not previously held in captivity and space at the South Perth premises is limited.

Options available, after drawing up a species priority list are:

i) CALM can support Perth Zoo in setting up captive-breeding programs by providing the initial animals and advising or conducting research in the initial phase.

ii) Follow the example of the Short-necked Tortoise and Numbat breeding programs. The initial research would be carried out by CALM (if possible with outside funding) or at Perth Zoo with CALM research input. When the techniques are finalised other zoos can be brought in to share the load of keeping sufficient numbers. Any surplus animals would be returned for release under CALM direction.

The Department's role in re-establishment or translocation of animal populations in collaboration with the Zoo would be in selection of areas, research into the ecology, life history, genetics and captive breeding of priority species, and carrying out an monitoring the re-establishment program. The Zoo would provide holding and breeding facilities and expertise in husbandry and record-keeping.

4. POLICY

The Department will:

4.1 Identify and place in priority those threatened plant and animal species in need of re-establishment or translocation in the wild from captive-bred or cultivated populations.

4.2 Undertake and foster research into the ecology, population biology, genetics, captive-breeding or cultivation, and re-establishment of threatened flora and fauna in the wild.

4.3 Collaborate and liaise with other organisations to coordinate research, propagate, breed and utilise other methods of conserving the genetic resources of threatened plants and animals.

4.4 Ensure that the translocation or re-establishment in the wild of any threatened species is conducted under an approved Wildlife Management Program or Interim Wildlife Management Guidelines.

4.5 Translate research findings into ongoing management practices, including monitoring, to ensure the successful re-establishment or translocation of captive bred or cultivated populations of threatened species.

5. STRATEGIES

To accomplish the Departmental objectives and policies staff will:

5.1 Establish criteria for identifying and prioritizing those threatened species where captive breeding or cultivation followed by re-establishment or translocation is desirable and necessary to avert extinction.

5.2 Develop Wildlife Management Programs or Interim Wildlife Management Guidelines for threatened plant or animal species and appoint fixed-term "recovery teams" for their implementation.

5.3 Undertake research into the ecology, population biology, genetics, captive breeding and cultivation, maintenance of habitat quality, habitat restoration and re-establishment of threatened flora and fauna in the wild.

5.4 Foster research and collaborate with Kings Park and Botanic Garden and other organisations on the propagation and cultivation of threatened flora; species to be addressed in priority order.

5.5 Foster research and collaborate with the Perth Zoological Gardens and other organisations on captive breeding of threatened native fauna; species to be addressed in priority order.

5.6 Re-establish and translocate populations in the wild under approved Wildlife Management Programs or Interim Wildlife Management Guidelines.

5.7 Maintain in the Departmental seed store suitable stocks or properly documented collections of seed from threatened plant species and ensure that replicates are exchanged with Kings Park and Botanic Gardens and the Division of Plant Industry, CSIRO Canberra.

5.8 Foster distribution of captive-bred threatened fauna and the proper maintenance of captive populations (including the use of stud books) in zoos throughout Australia and overseas.

5.9 Undertake training in the management practices necessary for the re-establishment and monitoring of populations of threatened species.

5.10 Monitor and enhance numbers in the wild by implementing ongoing management of threatened species and their habitat.

5.11 Collect from wild plant populations, under approved programs, seed and other propagating materials from threatened taxa for use by Kings Park and Botanic Gardens in cultivation programs.

5.12 Establish and maintain seed orchards of selected threatened species under approved Wildlife Management Programs or Interim Wildlife Management Guidelines.

5.13 Propagate and build up cultivated stocks of threatened flora in Departmental nurseries, in collaboration with Kings Park and Botanic Gardens, for re-establishment and translocation in the wild under approved Wildlife Management Programs or Interim Wildlife Management Guidelines.

5.14 Publicise efforts to avert extinction of threatened flora and fauna using re-establishment or translocation techniques, and encourage community involvement and seek sponsorship and donations for conservation of these threatened species.

Syd Shea
EXECUTIVE DIRECTOR

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