

FAUNA & TREE MANAGEMENT

6.0 FAUNA AND TREE MANAGEMENT IN CENTENNIAL PARKLANDS

6.1 BACKGROUND TO REPORT

The purpose of the report is:

To review the draft Tree Masterplan for the Centennial Parklands, and develop principles and strategies consistent with the draft Masterplan that will optimise the value of the Centennial Parklands for native fauna and sustain a diversity of fauna.

This review was undertaken to develop principles and strategies consistent with the Centennial Parklands' Tree Masterplan that will optimise the value of the Parklands for native fauna and sustain a diversity of fauna. The development of the Tree Masterplan provides an opportunity to reinstate or create habitats for native fauna, which in turn will provide an additional dimension to the values of the Parklands.

6.2 FAUNA OBJECTIVES

It is proposed that following interim objectives for native fauna in the Parklands be adopted for implementation of the Tree Masterplan. These can be expanded later for the Parklands' Plan of Management or Masterplan.

1. To provide suitable habitat for a diversity of native fauna species which are endemic to the Parklands area or its immediate region.
2. To manage the trees of the Parklands to benefit all native fauna species, without unwarranted emphasis on any one species at the expense of others.
3. To provide the maximum fauna habitat within the limitations of the cultural setting, recognising the range of other values and objectives required of the Parklands.
4. To consider the future reinstatement of native fauna species to the Parklands only when there is appropriate habitat for such species.
5. To review the conditions that caused fauna species to be lost from the Parklands and to remove the causes of these losses wherever possible.
6. To discourage, remove, or otherwise control the establishment of non-native fauna in the Parklands, since such introduced species compete for habitat elements with native fauna species.

6.3 PRINCIPLES

The following are the suggested principles for guiding action and making decisions related to the Tree Masterplan about fauna.

PRINCIPLE 1

The fauna most desirable in Centennial Parklands is local native fauna, and this requires consideration of all fauna groups: Amphibia, Mammalia, Reptilia, Insecta and other invertebrates and Aves). Non-native fauna (pest species and other introduced species) are not desirable in this Australian urban parkland setting and should not be introduced or encouraged.

PRINCIPLE 2

The conservation principles of the Australian Natural Heritage Charter should be adopted to guide fauna conservation in the Centennial Parklands.

PRINCIPLE 3

Centennial Parklands is not a natural unaltered ecosystem; it is a changed environment from the original undisturbed condition found there prior to European settlement. However, habitat elements can be reinstated, re-created or enhanced in ways that allow fauna to exist there, and this habitat should be recognised as a valuable asset for the Parklands and for the conservation of biodiversity in the urban context.

PRINCIPLE 4

The Parklands have retained or developed many habitat elements that allow native fauna to live there for all or part of their life cycles. Such elements should be recorded and conserved, and enhanced where appropriate.

PRINCIPLE 5

Visitors may rarely, if ever, see some fauna species which are, nevertheless, present. Even though some fauna species and groups will be more visible and appealing to visitors than others, it is desirable to provide for all appropriate native fauna in the Parklands.

PRINCIPLE 6

The strategies for fauna should, as far as possible, be consistent with the desired character of the Parklands as expressed in the Plan of Management and the draft Tree Masterplan.

PRINCIPLE 7

When changes are made to the tree plantings in the Parklands, for example by block removal of tree groups, the aim should be that there is no net loss of the fauna habitat provided by those trees unless sufficient similar habitat elements are provided elsewhere in the Parklands.

PRINCIPLE 8

The two areas of the original native vegetation that remain in the Parklands are extremely important to the fauna and should be carefully conserved.

PRINCIPLE 9

Populations of fauna species fluctuate naturally, in response to changes in environment. Therefore it is not appropriate to attempt to maintain consistently high numbers of "favoured" species, but rather these fluctuations in numbers should be allowed to occur.

PRINCIPLE 10

Fauna management in the Parklands should consider creating and reinforcing connectivity of habitat within the Parklands and direct or indirect linkages to habitat beyond the Parklands' boundaries. This will expand the effective habitat size of the Parklands and assist regional movements of fauna.

PRINCIPLE 11

The value of trees for native fauna is often very high when they are old, senescent or even dead. Where there is no cultural heritage, safety or design imperative, consideration should be given to retaining a number of such trees, standing and fallen, particularly hollow-bearing trees, with appropriate interpretation to explain their function to visitors.

PRINCIPLE 12

Ground treatment under trees can increase habitat value, such as allowing grasses to grow, and leaving tree litter on the ground.

6.4 FAUNA RESPONSIBILITIES - LEGISLATION

The Trust has responsibilities for protection of native fauna under the National Parks and Wildlife Act and the Threatened Species Conservation Act.

The primary framework for managing the Parklands is the Centennial Park and Moore Park Trust Act 1983 No 145 and the Parklands' Plan of Management, which is a requirement of the Act. The Objects of the Trust (Section 8) are:

- (a) to maintain and improve the Trust lands,
- (b) to encourage the use and enjoyment of the Trust lands by the public by promoting and increasing the recreational, historical, scientific, educational, cultural and environmental value of those lands,
- (c) to maintain the right of the public to the use of the Trust lands,
- (d) to ensure the protection of the environment within the Trust lands, and
- (e) such other objects, consistent with the functions of the Trust in relation to the Trust lands, as the Trust considers appropriate.

Fauna responsibilities could be inferred to derive from Objects (a), (b) and (d).

6.5 STANDARD

The appropriate standard to guide fauna conservation management is the Australian Natural Heritage Charter¹. This Charter provides a structured approach to conservation management that is compatible with that of the Burra Charter for historic heritage places. The draft Tree Masterplan refers extensively to the Burra Charter and should also adopt the Australian Natural Heritage Charter to guide natural heritage conservation.

For the Parklands the approach that could be adopted for fauna conservation on a precinct basis would be:

1. Identification of the significant values (existing and potential) of the fauna of the Parklands related to trees, by reference to records or by new surveys;
2. Decide on the best strategic approach to fauna conservation in each precinct;
3. Determine the conservation processes that would be appropriate; and
4. Prepare a concise fauna conservation management plan for each precinct, to be added to the Tree Masterplan as each is completed.

¹ Australian Heritage Commission and Australian Committee for IUCN. *Australian Natural Heritage Charter* 1996.

6.6 THE PARKLANDS' FAUNA

Centennial Parklands is close to the centre of Australia's largest city but nevertheless retains a range of native fauna species, which spend all or part of their life cycles in the park.

The Trustees are required to provide for the Parklands' many recreational visitors and to conserve the cultural heritage based on its history of development, and to protect the very old formal plantings. While the area is not intended to be a "pristine" natural ecosystem, there is still a place for native fauna in the Parklands.

Which fauna groups are important for the Parklands and the Tree Masterplan? All fauna is valuable and interesting – invertebrates, herpetofauna (reptiles and amphibians), mammals and avifauna (birds). The native fauna most visitors will encounter will be birds, and it is this group that may be most affected by the Tree Masterplan.

Fauna may use the Parklands for all or part of their lifecycle or habitat needs. In the densely developed eastern suburbs of Sydney, a large open space such as Centennial Parklands is one of the few suitable places for native fauna.

Many native fauna species which once would have existed in the Parklands could no longer survive if they were reintroduced: many of the habitat elements which they require no longer exist there, the relatively small area of the Parklands is insufficient for many species, and introduced predators (such as foxes, dogs and cats) will remain a threat for the foreseeable future. Species such as Eastern Grey Kangaroo (*Macropus giganteus*) Swamp Wallaby (*Wallabia bicolor*), Emu (*Dromaius novaehollandiae*), Short-beaked Echidna (*Tachyglossus aculeatus*), and Common Wombat (*Vombatus ursinus*), which would once have roamed this region, would not be able to find refuge from disturbance and predation in today's parklands environment, and any attempt at reintroduction would be doomed to failure.

Nevertheless the Parklands remain suitable for many fauna species if habitat can be provided, and the most serious threats removed. The abundance and diversity of fauna that once existed in the Lachlan Swamps might never be seen there again, but the visitors to the Parklands will still derive much pleasure for their encounters with the native fauna that can find suitable habitat there, and this fauna is also important for research and education.

It is therefore important to conserve the fauna that remains, and perhaps to plan for future reinstatement of some species that no longer are found in the Parklands.

6.7 FAUNA CONSERVATION IN AN URBAN PARK SETTING

An urban park that has been modified to the extent of Centennial Parklands, and which has a range of other objectives, cannot offer a natural ecosystem that supports the original complex habitats of the whole range of native fauna that might once have lived there.

Therefore it is necessary to set aims and principles for managing fauna in the Parklands that are reasonable and appropriate in today's setting. The original vegetation and fauna habitats cannot be reinstated, but the parklands' introduced plant species and other features can supply some of the habitat required by many native fauna species.

6.8 TREES AS HABITAT

6.8.1. THE ORIGINAL HABITAT

The original vegetation of Centennial Parklands would have been vegetation now known as Eastern Suburbs Banksia Scrub, and extensive wetland areas. Most of the area was originally swampy land with low sandstone ridges and sand dunes supporting the Eastern Suburbs Banksia Scrub. There would have been some forest communities on the wetland edges, and swamps in some of the dune swales.

The fauna that it would have supported would have been very different to that which the vegetation of the Parklands would support today. Centennial Parklands is, in all but a few patches, a substantially altered landscape. It is impossible to be certain of the original fauna species that once lived in this place and the way in which they would have used this area, but there is enough information to indicate the original fauna complement of the area. Some of the original natural elements have been restored or reinstated, and many new habitat elements, equivalent to those that once existed there naturally, have been created unintentionally by plantings of introduced species designed for other purposes.

In fauna habitat terms, the original vegetation would have had greater structural complexity, which generally supports greater diversity of fauna species, or larger population density of fauna species. The following elements illustrate the change that has occurred in structural complexity. In the past there would have been:

- Greater shrub density
- More middle storey plants
- More lower storey plants
- Less grass cover
- Greater grass height (where grass occurred)
- More ground litter mass and cover
- More logs and fallen tree branches on ground
- More loose rock on ground (on ridges)
- More trees with hollows

The Centennial Parklands of today also have lost much of their connectivity with other areas where native fauna may continue to exist. Thus, when species are lost from the Parklands, for whatever reasons, it is much more difficult that it was in the past for those species to recolonise the Parklands from other sources. This isolation means that, for many species, the only way in which they could ever reappear in the parklands is through artificial reintroduction programs. For these to be successful, there would need to be habitats that would again support the species, and the threatening conditions or processes which contributed to or caused their demise would need to have been mitigated or removed.

Even if habitat is restored, the continual disturbance by humans and animals such as dogs, cats and foxes will continue, and these factors place limits on the fauna that the Parklands will be able to support.

6.8.2. FAUNA AND TREE HABITAT

Trees provide habitat for fauna in myriad ways: places for feeding, resting, hiding and raising young. It must be emphasised that trees alone do not provide all of the needs of fauna; the trees are part of the “web of life” of the Parklands. The habitat provided to fauna by trees in the Parklands is abundant. For example, it includes hollows for roosting and nesting, open canopies for insectivorous bats, twiggy growth favoured by some spiders, a litter layer where invertebrates can thrive, bark of many textures as insect habitat, flowers which attract butterflies and fruits as food for birds and flying foxes.

It is not possible to list or prescribe exactly the fauna requirements that should be aimed for in the Parklands; each species and group has different needs. Rather, general principles (see above) should be adopted which will optimise the fauna habitat.

The presence / absence and abundance of arboreal marsupials and many birds depends mainly on the tree groupings and structure, in particular the presence, condition and spatial distribution of habitat (particularly hollow-bearing) trees. The usefulness of habitat trees depends on their structural features, as well as their location and spatial distribution.

6.8.3. OLD TREES

Many trees are of less value as habitat when they are young, and their value increases as they mature. Of course, such generalisations are not true for all species, and the best strategy is to have all age classes (young, mature, old) present.

Because of the hazards in the life of a tree, either in nature or in Parklands, very old trees are usually the least abundant. In a Parklands situation, it is relatively easy to establish large numbers of the youngest age classes; mature, well-formed trees are usually the most desirable in a traditional park, and the “unkempt” appearance of old trees and the likelihood of their losing limbs usually means that their life is terminated just at the time that they are likely to become most valuable to many fauna species.

The data in the draft Tree Masterplan indicates that the approach of the end of life for many of the Parklands’ trees is a nightmare for park managers and a potential bonanza for fauna that are dependent on hollows for nesting and roosting. Trees described as “senescent” or “overmature” fall into this category.

6.8.4. DEAD TREES

Dead trees can provide a range of very valuable habitat for fauna. However, standing dead trees or trees with major dead branches present very great problems for managers in an urban park setting such as Centennial Parklands because:

1. They generally are not consistent with the desired landscape design of the park.
2. They present a danger to park users if they fall or drop limbs.
3. They occupy space that could be used for living trees.
4. Park visitors may regard a dead tree as a symptom of poor maintenance.
5. A dead tree in an avenue of similar trees is a seriously discordant element.

However, it is highly desirable to keep or create some of this habitat element in the Parklands, and there might be circumstances where dead trees can be retained for fauna on a planned basis. For example:

- Stag habitat in or overhanging ponds could be retained where there is no visitor safety problem.
- Fallen dead trees could be left in place in inconspicuous areas to provide ground fauna habitat such as shelter for reptiles and amphibians.
- Logs could be moved to appropriate sites on pond edges to create habitat for aquatic fauna, and sites for basking, perching and water entry and exit.

6.8.5. TREE HOLLOW AND CAVITIES

The age of Centennial Parklands trees has enabled many of them to develop the sort of habitat values that would develop in a native forest under natural conditions. In particular, trees provide habitat for cavity-dependent fauna. The presence and abundance of arboreal marsupials and hollow nesting birds depends partly on this feature. For example, all local parrot species nest in hollows.

It would be valuable to incorporate in the tree planting plan provision for replicating the structural development of a natural forest by planting several groups of local native eucalypt species, which will be allowed to reach hollow-bearing age (probably 100-200 years). This would avoid the need to rely on other trees for hollows where the management objectives may not allow retention through the stages of senescence and death.

Because many native species are territorial, hollow-bearing trees need to be dispersed throughout the Parklands. If most of the hollows are located in trees clustered in a small area, many hollows will be effectively unavailable for occupation because of the territorial behaviour of some species.

Planned plantings of tree species such as eucalypts, which will ultimately produce hollows, could be considered for the less intensively used parts of the Parklands, where some trees can be allowed to age, produce hollows, and be left standing when they die. This will require visitor education and a long-term perspective. Planting such trees now would provide options for managers of the future, even though some of the problems might seem insuperable today.

6.8.6. MANAGEMENT OF NATIVE VEGETATION REMNANTS

The Draft Tree Masterplan is silent on the matter of the two important native vegetation remnants of Eastern Suburbs Banksia Scrub within the Parklands (the Bird Sanctuary and the York Road site). This community is listed as an Endangered Community under the Threatened Species Conservation Act and required careful management. They serve as refuges for fauna that might not otherwise exist in the Parklands. In particular, the invertebrate fauna that exists here would be potentially important. They may also retain original relatively undisturbed soil profiles, which can provide a reference to assist management of appropriate soils for future indigenous plantings.

The management of the plant species, including the trees, in these small remnant sites requires different techniques to those that are generally used elsewhere in the Parklands. Fire, a natural component of native plant communities, has been excluded from these areas for a long time, and it is likely that the plants are becoming too old to reliably produce viable seed. Without small patch fire (or smoke) treatment there is unlikely to be adequate regeneration of these remnants. However, before such a procedure, the rabbits, which also find refuge there, must be eradicated, as they will graze any regrowth. Rabbits are also extensively excavating the soils.

Elimination of the rabbits within the "Bird Sanctuary" and construction of a fence that excludes rabbits, foxes, dogs and cats is now a priority, and should not be deferred. The additional remnant recently acquired by the Trust at York Road requires similar management treatment.

6.9 VISITOR PERCEPTION OF FAUNA

Most visitors to the Parklands live within a five-kilometre radius of the area and the main catchment of the park is very densely settled. In the main visitor catchment, almost 33% of households do not have a vehicle. Most visitors come to the park 2-3 times a week.

These facts indicate that, for many visitors, the Parklands provide their main contact with the "natural" world.. The vegetation plus the fauna of the Parklands provides an important and appealing dimension to many people's lives, and the return visits mean that people will be able to observe seasonal changes in this environment, particularly its fauna.

The 1995 Visitor Survey revealed that 50% of Park visitors stated that "getting close to nature" was a recreation experience of most importance to them. Perceptions of nature vary, but it can be assumed that the presence of fauna enhances this experience. Most visitors will see and appreciate birds; other fauna elements (invertebrates, amphibians, reptiles, mammals) are less obvious, but visitors appreciate sightings that do occur.

Management practices most desired by park visitors who participated in the survey included "maintain vegetation and forest areas in their natural state". Clearly, there is a perception of naturalness of the Parklands, even though the landscape and ecosystem substantially changed for its "original" (pre-European) condition.

These two aspects of visitor perception and values provide an additional dimension to the purpose of maintaining native fauna in the Parklands, and justify managing fauna in a positive way rather than it being an accidental bonus of other strategies for tree and environmental management.

6.10 TREE HABITAT AND INTRODUCED FAUNA SPECIES

Eradication of non-native pest species living in the Parklands is desirable. A draft pest species management plan has been prepared, and should be progressed as soon as possible.

Mammals include Red Fox (*Vulpes vulpes*), Cat (*Felis catus*) and European Rabbit (*Oryctolagus cuniculus*), but these are not likely to be affected by the Tree Masterplan unless fallen trees are retained for habitat, which, without proper management, could become harbour for such species.

Habitat which favours introduced birds, for example, Common Starling (*Sturnus vulgaris*), Common Myna (*Acridotheres tristis*), can be inadvertently created by tree selection, and vigilance for early indicators of problems is an important management strategy.

6.11 TREE HABITAT AND “PROBLEM NATIVE FAUNA SPECIES”

Species that were once uncommon or in relatively low numbers may adapt to an urban environment as a result increase in numbers in Parklands, as enhanced habitat elements or lack of competition favours them.

Such species may become a public and environmental nuisance as their numbers continue to increase. Their protected status as native birds means that this is an issue that must be dealt with sensitively, and by management that, as far as possible, prevents the problem in future.

Trees can provide roosting sites for a number of potential problem species.

As an example, Australian White Ibis are already recognised as a problem in Centennial Parklands; a management plan is now being drafted to look at cull, control or eradication methods. Centennial Park has a permit from NPWS, and the management strategies of other organisations, particularly the Botanic Gardens and Taronga Zoo, are important so that colonies from these areas do not simply transfer to the Centennial Parklands in response to their control programs. The aim is to retain the Australian White Ibis at levels where they do not have adverse impacts on Parklands visitors or on other wildlife species.

Other species that may have similar potential to become a problem in the future include Sulphur Crested Cockatoo and Grey Headed Flying Fox (*Pteropus poliocephalus*). These should be monitored.

The strategies that need to be adopted are the same as other pest management strategies for non-native species, except that the aim is different – to retain the native species at a level which does not create a risk or nuisance. There will be a need to involve stakeholders in development of these strategies, with close co-operation with the National Parks and Wildlife Service. Because such control programs may be controversial, an education program is a priority in such programs.

The impacts of large increases in numbers of a species can include:

- Displacement of other fauna
- Water pollution through their droppings
- Tree damage
- Direct interference with picnickers
- Disease, which can occur in the “pest” species, may spread to other species.

Large aggregations of birds may be a periodic natural occurrence for some species, and the trees of Centennial Parklands have provided sites where this occurs. Such periodic occurrences are not generally a problem, and could be of considerable interest to visitors.

An example of the abundance that once occurred in the Parklands is provided by Andrew Taylor¹, who quotes a 1930 article in *Emu* [1] (author P.A. Gilbert), which “describes a survey (by rail) in Autumn 1930 of Magpie-lark flocks around Sydney. The biggest was 3000 roosting in Moreton Bay fig trees in Centennial Park. He describes the “grand spectacle” of this flock’s arrival to roost. He notes these flocks as forming in March and dispersing in July.”

Taylor comments “I don’t think flocks of anything like this size occur now in Sydney. Why they no longer occur is an interesting question, as is whether such flocks occurred before European settlement of Sydney.”

¹ Andrew Taylor, posting on birding-aus@lists.vicnet.net.au, 30 May 2001

6.12 PROSPECTS FOR FAUNA SPECIES REINSTATEMENT

Continuing fauna survey is needed to gain information on trends and presence or absence of fauna groups and species, and the way in which some species use the Parklands intermittently. Most groups of fauna appear to be very limited in the Parklands, and in many cases, the reasons for low numbers or decline are not well understood.

Reptiles appear to be present only in very low numbers. WIRES reports that no reptiles have ever been brought in from the Parklands; they say that they would expect to see reptiles from time to time if they were present in any numbers. Eastern Blue-tongued Lizards (*Tiliqua scincoides*) are occasionally seen in some areas, including the Lachlan Swamps and the Depot Area. With so little ground shelter (rocks, logs, tall grass, tree litter) for reptiles, it is perhaps not surprising that they are uncommon in the Parklands.

Juvenile and adult insectivorous bats have been brought in to WIRES, as have numerous birds. Ring-tailed possums are not recorded in the Parklands now, nor for most of the eastern suburbs. Brush tailed possums and Flying Foxes are present. No other native mammals have been recorded in recent times.

There is little point in attempts at reinstatement of vertebrate fauna unless suitable habitat conditions are restored in the Parklands, and the threats removed which caused the demise of these species. Aquatic species are, in general, beyond the scope of this report, although it may be possible to reinstate the native water rat (*Hydromys melanogaster*) at some time in the future if predators were removed and habitat reinstated. Reinstatement of *Hydromys* habitat could include using fallen trees as snags on pond edges for water entry, shelter and feeding sites. Such use of logs would also benefit tortoises, water dragons, frogs and aquatic invertebrates.

6.13 TREE/FAUNA RECORDS - DATA SYSTEM

Now that the Parklands' tree inventory is recorded on a computerised system it is important that the records include the fauna record. The Parklands data system now provides an individual record for most (over 8,700) individual trees in the Parklands, and for another 2000 trees recorded as "woodlot" areas of similar plantings.

At present, habitat is only recorded for the 20 landscape types identified for the Parklands, and not at the individual tree or tree group level.

This data reference system should be used to record fauna use of individual trees, on an opportunistic basis where fauna is observed to be using the trees in a specific way, or later, by a systematic survey of Precincts or Wards. Such information should include fauna of special interest observed using a tree (roosting, nesting, feeding etc.). It will be important that this logging of fauna use of trees is on a continuing basis, as trees change in their fauna values as they mature and age.

The accumulation of such fauna data will enable the value of a particular tree or type of tree to be assessed if it is proposed for removal, and an assessment of the contribution of that tree in the "no net habitat loss" equation. These records should be used when any decision is under consideration for removal or replacement of the tree, or a tree of the same type and age.

6.14 THE CENTENNIAL PARKLANDS PLAN OF MANAGEMENT

The Plan of Management (March 1998) recognises wildlife habitat areas as a value of the Parklands, and refers to both its natural and its cultural values.

A key issue identified in the Plan of Management (p.20, Volume 1) is "The Trust must balance conservation and rehabilitation of the Victorian landscape with the importance of providing for the natural environment..." This dilemma is a considerable challenge. The Plan of Management provides as Strategy 8 (p. 27)

"Conserve and enhance the significant natural and cultural heritage of the Centennial Parklands, optimising opportunities for ecological sustainability."

Strategic Actions for 1997 – 2003 (p. 27) include:

"Establish a Fauna Inventory and Management Plan"

and

"Develop and implement pest plant and animal species control program"

and

"Develop a natural, landscape and cultural heritage register".

All of these actions should be integrated with the Tree Masterplan to provide the management framework for fauna.

6.15 PERFORMANCE EVALUATION OF FAUNA OUTCOMES OF THE TREE MASTERPLAN

It would be desirable to include indicators of fauna management success in any future performance evaluation plan for the Tree Masterplan.

Indicators might include:

- Trends in fauna species diversity and abundance
- New fauna species recorded
- Indicator of visitor appreciation of fauna
- Other indicators related to particular fauna species of interest.

6.16 CONCLUSIONS AND FINDINGS

Overall, the draft Tree Masterplan provides an adequate basis for managing fauna trees habitat in the Parklands, and to optimise the way in which the trees of the Parklands can add value for native fauna and sustain a diversity of fauna when the Masterplan is implemented.

The competing objectives of recreational uses, cultural heritage conservation, and the nature of the traditional design and historic plantings make the Parklands a place that could never be returned to the original "natural" environment. Nevertheless, with sound management, much valuable fauna habitat can be provided.

The report includes fauna objectives, principles, and a standard for the Tree Masterplan. Refinement the Masterplan's detail would ensure that fauna is adequately considered as the plan is implemented. Most of these suggestions are in Part B of the report, and might be adopted to augment, rather than alter, the Masterplan.

It is recommended that:

- The Statement of Significance for the Parklands should be extended to include reference to natural heritage, including fauna and its habitat.
- Habitat linkages and connectivity throughout the parklands and with surrounding areas should be retained.
- The principle of "no net loss" of fauna habitat should be adopted in implementation of the Tree Masterplan.
- Adoption of the objectives and principles in this report might serve as interim fauna management principles until a comprehensive fauna plan for the Park Masterplan is completed.
- Fauna conservation management plans should be prepared for each Parklands precinct, to be added to the Tree Masterplan as each is completed.
- A program of eradication or control of introduced and pest species of animal should be implemented as soon as possible, to prevent further loss of native fauna from predation and habitat competition.
- Plans for management are needed for some native bird species that can become a nuisance in the Parklands because of habitat provided by the trees.
- Systematic monitoring and a continual program to add to the knowledge of fauna in the Parklands are needed to assist managers. The Parklands' data reference system should be used to record fauna use of individual trees, and this information used in future tree management decisions.
- Consideration should be given to retention in appropriate areas of the Parklands of some old trees, dead trees and fallen dead trees, which provide valuable habitat for fauna species.

6.0 FAUNA AND TREE MANAGEMENT IN CENTENNIAL PARKLANDS

17.0 VALUE FOR BIRDS - TREE SPECIES ASSOCIATED WITH CENTENNIAL PARKLANDS

Lists are from Draft Centennial Parklands Tree Masterplan .98.571 *Volume 1*. The indicative notes on the value for birds of trees on the lists on of the draft Tree Masterplan were provided by Andrew Burton, Sydney and are acknowledged with appreciation. Other information that becomes available from local observations might be added to these lists as a guide for the future.

Trees associated with Moore and Jones (1887 -1896)

<i>Araucaria heterophylla</i>	Norfolk Island Pine	Generally poor
<i>Araucaria columnaris</i>	Cook Pine	"
<i>Araucaria cunninghamii</i>	Hoop Pine	"
<i>Corynocarpus laevigatus</i>	Karaka	-
<i>Ficus macrophy/1a</i>	Moreton Bay Fig	Attracts Figbirds (<i>Sphecotheres viridis</i>)
<i>Ficus rubiginosa</i>	Port Jackson Fig	"
<i>Pinus radiata</i>	Monterey Pine	Attracts Yellow-tailed Black-Cockatoo (<i>Calyptorhynchus funereus</i>)
<i>Salix babyonica</i>	Weeping Willow	Generally poor
<i>Grevillea robusta</i>	Silky Oak	Useful
<i>Pinus halepensis</i>	Aleppo Pine	-
<i>Ulmus procera</i>	English Elm	May provide useful roost

FAUNA VALUE - birds

Trees associated with Maiden and Forsyth (1896 -1924)

<i>Acacia baileyana</i>	Cootamundra Wattle	-
<i>Acacia binerva</i>	Coast Myall	Good
<i>Callitris sp.</i>	Native Cypress Varieties	-
<i>Casuarina glauca</i>	Swamp She Oak	Roosting, and for "gleaning" birds such as red-browed finches.
<i>Erythrina x sykesii</i>	Coral Tree	Good – food in flower, and nesting
<i>Eucalyptus microcorys</i>	Tallowwood	When in flower attractive to birds and butterflies
<i>Eucalyptus robusta</i>	Swamp Mahogany	Flower are a very attractive food source
<i>Ficus rubiginosa</i>	Port Jackson Fig	Attracts Figbirds (<i>Sphecotheres viridis</i>)
<i>Lophostemon confertus</i>	Brush Box	Less valuable away from rainforest
<i>Melaleuca quinquenervia</i>	Five-veined Paperbark	Good
<i>Phoenix canariensis</i>	Canary Island Date Palm	May provide roost for problem bird species – Common Starling (<i>Sturnus vulgaris</i>) and White Ibis (<i>Threskiornis aethiopica</i>) as well as others
<i>Phoenix dactylifera</i>	Date Palm	"
<i>Phoenix reclinata</i>	African Wild Date Palm	-
<i>Quercus ilex</i>	Holly Oak, Holm Oak	-
<i>Strelitzia nicholai</i>	Bird of Paradise Tree	Food source when in flower
<i>Syagrus romanzoffianum</i>	Queen Palm	-
<i>Washingtonia robusta</i>	Mexican Washington Palm	Poor. Attractive to Common Starlings

Trees associated with post 1924 plantings

<i>Afrocarpus falcatus</i>	Yellowwood	-
<i>Cupaniopsis anacardioides</i>	Tuckeroo	-
<i>Populus nigra var. italica</i>	Lombardy Poplar	Poor
<i>Liquidambar styraciflua</i>	Liquidambar Monotoca elliptica	-
<i>Pinus pinaster</i>	Maritime Pine	-
<i>Melaleuca armillaris</i>	Bracelet Honey Myrtle	Food source (honeyeaters) when in flower
<i>Ficus microcarpa var. hillii</i>	Hills Fig	-

6.0 FAUNA AND TREE MANAGEMENT IN CENTENNIAL PARKLANDS

Trees that have performed poorly in the past		FAUNA VALUE - birds
<i>Acacia longifolia</i>	Coast Wattle	-
<i>Agonis flexuosa</i>	Weeping Peppermint	-
<i>Eucalyptus lehmannii</i>		-
<i>Pinus halepensis</i>	Aleppo Pine	-
<i>Populus a 'Pyramidalis'</i> (syn. <i>P. bolleana</i>)	Bolleana Poplar	Poor
<i>Populus alba</i>	Silver Leaf Poplar, White Poplar	Poor
<i>Quercus robur</i>	English Oak	Roosting
<i>Ulmus procera</i>	English Elm	-
Trees with structural or other public risk concerns		
<i>Erythrina x sykesii</i>	Coral Tree	Good – food in flower, and nesting
<i>Ficus microcarpa</i> var. <i>hillii</i>	Hill's Fig	-
Trees prone to disease or pest attack		
<i>Phoenix canariensis</i>	Canary Islands Date Palm	May provide roost for problem bird species – Common Starling (<i>Sturnus vulgaris</i>) and White Ibis (<i>Threskiornis aethiopica</i>) as well as others
<i>Washingtonia</i> spp.		Poor
<i>Pinus halepensis</i>	Aleppo Pine	-
Trees worthy of wider use		
<i>Afrocarpus falcatus</i>	Yellowwood	-
<i>Agathis robusta</i>	Queensland Kauri	-
<i>Alphitonia excelsa</i>	Red Ash	-
<i>Angophora floribunda</i>	Rough-barked Apple	Good food when in flower,
<i>Araucaria columnaris</i>	Cook's Pine	-
<i>Araucaria cunninghamii</i>	Hoop Pine	-
<i>Butia capitata</i>	Jelly Palm	-
<i>Callitris</i> spp	Native Cypress varieties	-
<i>Cordyline australis</i>	Native New Zealand Cabbage Tree	-
<i>Cupaniopsis anarcardioides</i>	Tuckeroo	-
<i>Cyathea australis</i>	Rough Tree Fern	-
<i>Eucalyptus eximia</i>	Yellow Bloodwood	Good – food source when in flower
<i>Eucalyptus grandis</i>	Flooded Gum	Good – food source when in flower
<i>Ficus superba</i> var <i>henneana</i>	Deciduous Fig, Cedar Fig	-
<i>Ficus virens</i>	Green Fig	-
<i>Flindersia australis</i>	Crow's Ash	-
<i>Glochidion ferdinandii</i>	Cheese Tree	-
<i>Juniperus chinensis</i>	Easter Red Cedar	-
<i>Liquidambar styraciflua 'Festeri'</i>	Sweet Gum	-
<i>Livistona australis</i>	Cabbage Tree Palm	Attractor of Topknot Pigeons (<i>Lopholaimus antarcticus</i>)
<i>Livistona chinensis</i>	Chinese Fringe Palm	-
<i>Lophostemon conferlus</i>	Brush Box	-
<i>Phytolacca dioica</i>	Ombu	-
<i>Podocarpus elatus</i>	She-Pine	-
<i>Quercus ilex</i>	Holly Oak	-
<i>Quercus suber</i>	Cork Oak	-

6.0 FAUNA AND TREE MANAGEMENT IN CENTENNIAL PARKLANDS

Trees worthy of wider use cont.

<i>Quercus virginiana</i>	Live Oak	-
<i>Salix spp</i>	Willow varieties	Poor
<i>Strelitzia nicolai</i>		-
<i>Syzygium spp</i>	Lilly Pilly varieties	Fruit provide food source
<i>Taxodium distichum</i>	Swamp Cypress	-
<i>Tristaniopsis laurina</i>	Water Gum	-

Trees Worthy of introduction

<i>Aloe bainesii</i>		
<i>Angophora costata</i>	Smooth Barked Apple	Good – food in flower, develops hollows
<i>Bauhinia spp.</i>	Orchid Tree	-
<i>Brachychiton acerifolia</i>	Illawarra Flame Tree	-
<i>Brachychiton discolor</i>	Queensland Lace Bark	-
<i>Castanospermum australe</i>	Black Bean	-
<i>Diploglottis australis</i>	Tamarind	-
<i>Dracaena draco</i>	Dragon Tree	-
<i>Elaeocarpus grandis</i>	Silver Quandong	Fruit provide food source
<i>Harpullia pendula</i>	Tulipwood	-
<i>Jubaea chilensis</i>	Chilean Wine Palm	-
<i>Koelreuteria paniculata</i>	Golden Rain Tree	-
<i>Metasequoia glyptostoboides</i>	Dawn Redwood	-
<i>Metrosideros excelsa</i>	Pohutokawa, NZ Christmas Tree	Good food source in flower
<i>Pararchidendron pruinosum</i>		-
<i>Sapium sebiferum</i>	Chinese Tallow Tree	-
<i>Schinus areira</i>	Peppercorn Tree	-
<i>Schinus terebinthifolius</i>	Brazilian Pepper Tree	-
<i>Spathodea campanulata</i>	African Tulip Tree	-
<i>Wollemia nobilis</i>	Wollemi Pine	-

FAUNA VALUE - birds

-
Poor
-
Fruit provide food source
-
-