

6 The Lowland Woodland Conservation Strategy

6.1

Introduction

The *Lowland Woodland Conservation Strategy* fulfils a number of roles. These are:

- Action Plans for species and ecological communities listed as threatened under the *Nature Conservation Act 1980*;
- a multi-species/ecological communities strategy for woodland conservation;
- a source document on lowland woodlands for ACT Government agencies with responsibilities for nature conservation, planning and land management; and
- a source document for community and other stakeholders with an interest in woodland conservation.

As an Action Plan prepared under the *Nature Conservation Act 1980* the *Strategy* addresses the requirement in section 23 of the Act, that it '*shall include proposals to ensure, as far as is practicable, the identification, protection and survival of the species, or the ecological community; or proposals to minimise the effect of any process which threatens any species or ecological community*'.

The *Strategy* provides information, strategic direction and performance criteria for a variety of government planning exercises, including:

- preparation of the Canberra Spatial Plan (during 2003-04);
- the Study of Non-urban Bushfire Affected Areas (Non-Urban Study Steering Committee 2003);
- completion of the North Gungahlin Structure Plan (due for completion during 2003-04);
- preparation of a Structure Plan for East Gungahlin (including the Gooroo area);
- preparation of a Structure Plan for the Jerrabomberra Valley; and

- preparation of any future land use proposals including any changes to the Territory Plan and the National Capital Plan, the shape and location of urban development and the use to be made of land surrounding metropolitan Canberra.

As part of these planning processes, decisions will be made by the ACT Government as to whether woodlands will be protected as Public Land (Nature Reserve), will remain without formal protection in other tenures under the Territory Plan, but subject to management requirements, or be modified or destroyed as pressures for urban expansion are addressed. This *Strategy* will be used by all agencies and others involved in land use planning decisions as one source of information on the suite of woodland values that are of conservation interest and/or significance.

Other natural and cultural values of particular areas of lowland woodland, such as evidence of Aboriginal occupation, recreational use and aesthetic amenity, and any educational and special scientific features, are normally taken into consideration during the planning and management phase and before specific proposals are developed by government agencies. Presenting information on these values is beyond the scope of the *Strategy*. It is recognised that other values placed on woodland areas by interested expert bodies and individuals and community groups may be important in their own right and complement the nature conservation values, thus adding to the overall significance of particular areas of woodland. The ACT Government takes these values into account through a variety of mechanisms, including environment impact assessment, and public consultation on proposals to amend the Territory Plan, Action Plans such as this *Strategy*, and Management Plans for Public Land prepared under the *Land (Planning and Management) Act 1991*.

6.2

Vision, Goals, Objectives and Actions for the *Lowland Woodland Conservation Strategy*

During a process of consultation with government and non-government stakeholders, community groups and interested members of the public a vision, goals, objectives and actions for lowland woodland conservation in the ACT have been prepared. These reflect a range of issues covering the requirements for information, planning, management and stakeholder involvement for woodland conservation and are set out in Table 6.1 in a format similar to that adopted by some Australian jurisdictions for recovery plans for threatened species.

The Objectives and Actions are intended to draw together the issues identified in Chapters 2–5 of the *Strategy* in a way that can be logically structured and more readily understood. They are arranged into six main groups covering Information, Protection, Threats, Planning, Management, and Community/landholder involvement. Some of the Actions that relate to particular threatened or uncommon plant or animal species are included at the end of Table 6.1.

Performance Criteria have been developed as an aid to future reviews of progress in implementing the *Strategy*. Achievement of targets depends on a number of factors including budget funding by the ACT Government, commitment by landholders, the involvement of community groups and other factors beyond the control of Environment ACT, which will take a leading role in coordinating the implementation of the *Strategy*.

Table 6.1: Vision, Goals, Objectives, Actions and Performance Criteria for the *ACT Lowland Woodland Conservation Strategy*

VISION

The Australian Capital Territory makes an outstanding contribution, regionally and nationally to conservation of Lowland Woodland.

PROTECTION GOALS

Woodland

Conserve in perpetuity all types of Lowland Woodland communities* in the ACT, as viable and well-represented ecological systems.

(* including the declared threatened ecological community and component threatened species)

Fauna and Flora

Conserve in perpetuity, viable, wild populations of all Lowland Woodland flora and fauna species* in the ACT, and support regional and national efforts towards conservation of these species.

(* including declared threatened species).

MANAGEMENT GOAL

Manage and rehabilitate Lowland Woodlands across all tenures with appropriate regeneration, restoration, and reinstatement practices.

Before European settlement, the temperate woodlands of the ACT and region, and their component floral and faunal communities, were once part of a great grassy woodland mosaic covering much of sub-coastal south-eastern Australia. In acknowledgment of the importance of this connectivity, the *ACT Lowland Woodland Conservation Strategy* takes an integrative, territory wide approach within a regional context, to the protection of the remaining lowland grassy woodlands. It recognises that in addition to the relatively intact, endangered woodland community there is a spectrum of woodland-grassland blends also of conservation value. The Strategy includes actions to identify and proposes means to protect important areas, and to identify areas suitable for regeneration and restoration to reconnect the mosaic. It will provide a guide to land use planning and environmental management in the ACT with respect to the remaining lowland woodlands.

NOTE: (i) See end of table for abbreviations and footnotes
(ii) Bracketed items at end of each Action indicate primary responsibility for, or significant participation in the Action

1. Information

Objective	Actions	Performance Criteria
<p>(a) The location, type and ecological condition of all Lowland Woodland in the ACT are described</p> <p>(b) A comprehensive database of Lowland Woodland and component species in the ACT is maintained</p> <p>(c) ACT data is included in national, state and community databases*</p> <p>*In particular the bird database developed and maintained by the Canberra Ornithologists Group</p>	<p>(a) Locate, classify, and assess the ecological condition of all "remaining Lowland Woodland in the ACT (EACT)</p> <p>(b) Continue to develop and maintain the database of Lowland Woodland to support planning, management and research (EACT)</p> <p>(c) Address those woodland elements where there is a lack of information</p> <p>(d) Link data collection to national, state and community databases (EACT, NSW, Cwlth, community)</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Location, type and condition assessments of all remaining woodland remnants completed ■ Survey and other relevant data entered into lowland woodland database within 6 months of collection ■ Data deficiencies are addressed ■ <i>Integrated Nature Conservation Plan</i>* includes up-to-date ecological data on woodlands and component species. ■ Data exchange protocols established with other priority database managers and regular exchange taking place <p>*The <i>Integrated Nature Conservation Plan</i> is the central repository for information related to nature conservation in the ACT. Based on a Geographical Information System it will show, for example, all ACT reserves, distribution of threatened species and ecological communities, important fauna habitat and locations where major works are planned or being undertaken.</p>

2. Protection

Objective	Actions	Performance Criteria
<p>(a) A comprehensive, adequate and representative system of Lowland Woodland areas in the ACT is protected by reservation, or other measures where reservation is not practical or desirable</p> <p>(b) Land development proposals affecting Lowland Woodland are assessed for their ecological impact</p> <p>(c) The ACT Heritage Places Register includes lowland woodland.</p>	<p>(a) Undertake evaluations of the extent to which protected and other areas managed for conservation contribute to a CAR system.</p> <p>(b) Develop and support appropriate reservation proposals for areas identified for reservation representing: (i) the geographic and ecological extent of the Lowland Woodland communities (ii) key habitat for threatened and declining species and (iii) elements that will achieve a CAR system (EACT, community).</p> <p>(c) Identify ecologically important off-reserve areas and determine the most appropriate form of protection (e.g. through LMAs, MOUs, voluntary agreements). Ensure that protection requirements are included in such agreements (EACT, ACTPLA, Cwlth)</p> <p>(d) Ensure land development proposals are assessed under relevant environmental impact, nature conservation and tree protection legislation</p> <p>(e) Work with the ACT Heritage Council to identify Lowland Woodland suitable for nomination to the ACT Heritage Places Register. Prepare nominations (EACT, ACTPLA, ACT Heritage Council).</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Degree to which nature conservation estate addresses CAR principles. ■ Areas of Lowland Woodland cleared or significantly modified by land development proposals. ■ Extent to which ecological connectivity is maintained or enhanced. ■ Woodlands identified as being essential for the ACT's reserve and off-reserve nature conservation system are appropriately protected. <p>2007–2009</p> <ul style="list-style-type: none"> ■ Woodlands that qualify for the ACT Heritage Places Register are listed. ■ Important off-reserve woodlands are subject to protection agreements appropriate to their tenures.

3. Threats

Objective	Actions	Performance Criteria
(a) Threats to Lowland Woodland and component species have been identified and prioritised. Appropriate planning and management actions have been taken to substantially reduce or eliminate threats.	<p>(a) Identify and monitor threats (including urban expansion, fragmentation, overgrazing, weed and pest invasion, firewood collection, dieback and fire) to Lowland Woodland and component species (EACT, ACTPLA, Cwlth, community)</p> <p>(b) Prepare and implement threat abatement responses (EACT, ACTPLA, Cwlth, community)</p> <p>(c) Monitor effect of threat abatement measures (EACT, ACTPLA, Cwlth, community)</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Actions to address priority threats to Lowland Woodland are in place and being implemented <p>2007–2009</p> <ul style="list-style-type: none"> ■ Priority threats to Lowland Woodland and component species are substantially reduced or decreasing

4. Planning

Objective	Actions	Performance Criteria
<p>(a) The <i>Lowland Woodland Conservation Strategy</i> and up-to-date ecological information is the major basis for assessing planning decisions impacting on conservation of Lowland Woodland and component species</p> <p>(b) Government and non-government organisations recognise the values of Lowland Woodland and component species and incorporate their conservation requirements in planning, development and land management activities</p> <p>(c) Woodlands and woodland remnants are assessed for their contribution to supporting protected areas and maintaining ecological connectivity across the ACT.</p> <p>(d) Lowland Woodland conservation contributes to targets established in the <i>Murrumbidgee Catchment Blueprint</i> through meeting targets in the <i>ACT Natural Resource Management Plan</i> (ACT NRM Board 2003).</p> <p>(e) Co-ordinated arrangements for the protection of Lowland Woodland are established across the region.</p>	<p>(a) Consult with all government and non-government parties participating in ACT and regional planning processes to ensure that information on the conservation significance of lowland woodland and component species is incorporated: (i) into strategic planning for the ACT and region and (ii) at an early stage into planning for urban and other development in the ACT (iii) into development control and management plans (EACT, ACTPLA, Cwlth, community)</p> <p>(b) Proposals assessed under the <i>Land (Planning and Environment) Act 1991</i> include information on woodlands and their component species.</p> <p>(c) Work with other agencies (development and infrastructure) and landholders (especially rural lessees and Commonwealth agencies) to prevent or minimise further fragmentation and maximise connectivity of Lowland Woodland and encourage activities aimed at improving viability of Lowland Woodland remnants (EACT, Cwlth, landholders, community)</p> <p>(c) Work with NSW agencies to develop, implement and promote measures for protection of Lowland Woodland communities in the region (EACT, NSW)</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ All planning and urban development decisions involving Lowland Woodland are based on the <i>Lowland Woodland Conservation Strategy</i> and ecological information. ■ Extent to which protection of Lowland Woodland communities contribute to regional targets for protection and connectivity. <p>2007–2009</p> <ul style="list-style-type: none"> ■ Lowland woodlands are part of a regional Conservation Management Network (CMN). ■ Targets in the <i>ACT Natural Resource Management Plan</i> for Lowland Woodlands are achieved.

5. Management

Objective	Actions	Performance Criteria
<p>(a) 'Best practice' management is applied to all Lowland Woodland in the ACT with particular attention to habitat of threatened, uncommon and declining species.</p> <p>(b) The ecological condition and habitat quality of the remaining Lowland Woodland communities in the ACT is maintained or improved</p> <p><i>*Regeneration</i> means the natural recovery of natural integrity following disturbance or degradation.</p> <p><i>*Restoration</i> means returning existing habitats to a known past state or to an approximation of the natural condition by repairing degradation, by removing introduced species or by reinstatement.</p> <p><i>*Reinstatement</i> means to introduce to a place one or more species or elements of habitat or geodiversity that are known to have existed there naturally at a previous time, but that can no longer be found at that place (<i>Australian Natural Heritage Charter</i>, 2nd Edit. 2002).</p>	<p>(a) Have in place management plans (Public Land) or similar arrangements (other tenures) that reflect commitment to active and effective conservation of woodland remnants</p> <p>(b) Continue to develop and promote 'best practice' management of Lowland Woodland and its component species (with particular attention to declining and threatened species in the ACT) (EACT) by:</p> <p>(i) Promoting research into conservation management of Lowland Woodland (EACT);</p> <p>(ii) Identifying and prioritising activities for regeneration and restoration* of Lowland Woodland (EACT);</p> <p>(iii) Developing and applying an 'adaptive management' approach linking research and monitoring to management (EACT);</p> <p>(iv) Developing 'best practice' management guidelines for managers of all land tenures and community groups to apply when undertaking woodland restoration* activities (EACT, Cwlth, landholders, community);</p> <p>(v) Reviewing management of Lowland Woodland areas in government horse paddocks and agisted land to ensure ecological condition is enhanced;</p> <p>(vi) Taking into account the known conservation requirements of component flora and fauna species (in particular, declining and threatened species) in management of Lowland Woodland (EACT, Cwlth, landholders, community).</p> <p>(c) Liaise with Commonwealth agencies responsible for managing National Land containing Lowland Woodland and habitat for threatened species, and keep the MOUs with those agencies under review (EACT, Cwlth)</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Area of Lowland Woodland with management plans or similar arrangements for 'active' conservation management ■ 'Best practice' guidelines for woodland restoration are prepared and regularly updated to take into account restoration experience and relevant research. ■ A register of suitable sites supports regeneration/restoration* activities and guides priority setting ■ Area of Lowland Woodland subject to restoration/regeneration management ■ Extent and nature of liaison with Commonwealth agencies, and effectiveness of MOUs in protecting Lowland Woodland and associated species on National Land. <p>2007–2009</p> <ul style="list-style-type: none"> ■ Research and monitoring are undertaken and the results used to inform managers of measures to improve ecological condition and habitat qualities. ■ Extent and nature of changed management practices to enhance ecological condition of Lowland Woodland in government horse paddocks and agisted land. ■ Monitoring of Lowland Woodland and associated species indicates ecological condition is maintained or improved

6. Community/landholder involvement

Objective	Actions	Performance Criteria
<p>(a) Landholders, community groups and others are actively involved in Lowland Woodland conservation.</p> <p>(b) Lowland woodland sites, their managers and the community are linked together in a Conservation Management Network.</p>	<p>(a) Encourage the involvement of landholders, community groups and others in the protection and management of Lowland Woodland (EACT)</p> <p>(b) Facilitate information and skills exchange between stakeholders aimed at achieving best practice management of Lowland Woodland (EACT, NSW, Cwth, landholders, community)</p> <p>(c) Encourage the formation of an ACT and NSW regional Conservation Management Network (CMN) for Lowland Woodland building upon the existing NSW CMNs (EACT, NSW, landholders, community)</p> <p>(d) Investigate opportunities for voluntary agreements and incentives for land managers to conserve Lowland Woodland and component species.</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ A Conservation Management Network (CMN) of sites with links to NSW CMNs is established. ■ Number and type of opportunities for managers of Lowland Woodland sites to exchange information about ‘best practice’ management ■ Availability and take-up of agreements and incentives to conserve Lowland Woodland and undertake ‘best practice’ management.

7. Threatened or uncommon plants (see Chapter 3 for more detail)

Key Action	Performance Criteria
<p>A Leek Orchid (Tarengo Leek Orchid) (<i>Prasophyllum petilum</i>)</p> <ul style="list-style-type: none"> n Seek an alternative location for a future cemetery and minimise future burials within the Hall Cemetery (EACT) n Prepare a new management plan based on accurate mapping of the location of the graves and plants (EAC). 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Hall Cemetery modified according to Hall Master Plan. ■ Cemetery managed under new plan. ■ Monitoring of orchids indicates increasing numbers of plants.
<p>Small Purple Pea (<i>Swainsona Recta</i>)</p> <ul style="list-style-type: none"> n Investigate reintroduction of plants into the Kambah site from other populations within the region (EACT). 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Reintroduction assessment provided to Flora and Fauna Committee and Conservator of Flora and Fauna for consideration. ■ Monitoring of pea plants indicates increasing numbers of plants.
<p>Austral Toadflax <i>Thesium austrade</i> and Hoary Sunray (<i>Leucochrysum albicans</i> var. <i>tricolor</i>) and rare species</p> <ul style="list-style-type: none"> n Maintain a database of known occurrences and abundance to enable analysis of changes in distribution and abundance (EACT). n Consider listing if any of the species are declining in extent and abundance (EACT). 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Data on extent and abundance provided to Flora and Fauna Committee for consideration regarding listing of species.
<p>Eucalypt outliers</p> <ul style="list-style-type: none"> n Maintain register of plants and encourage regeneration through fencing and weeding (EACT). 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Eucalypt outliers subject to documented management actions. ■ Assessments of condition of plants completed.
<p>Snow Gum woodland</p> <ul style="list-style-type: none"> n Priorities for management and protection all remaining Snow Gum woodland areas that are partially modified or moderately modified, where these are ecotonal between woodland and grassland (EACT) 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Protection and management in place consistent with priority assessments. ■ Priority Snow Gum woodlands are subject to appropriate levels of protection and to documented management actions.

8. Threatened, Declining or Uncommon Animals (see Chapter 4 for more detail)

Key Action	Performance Criteria
<p>INFORMATION</p> <p>n Identify key habitats and potential habitats for threatened, declining and rare woodland species, and areas of high biodiversity, based on database records held by Environment ACT and other organisations such as COG.</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Key and potential habitats identified.
<p>PROTECTION AND MANAGEMENT</p> <p>n Protection of habitat: Give priority for habitat protection and conservation management to woodland patches, particularly threatened species habitat, or those that are large or have complex habitat structure. (Hooded Robin, Brown Treecreeper).</p> <p>n Evaluate and implement the most appropriate form of habitat protection (Reservation, Memorandums of Understanding, Land Management Agreements, Directions by the Conservator of Flora and Fauna).</p> <p>n Maintenance and enhancement of connectivity: Give priority for habitat protection and restoration (re-creation of connections) to connections between woodland patches, particularly between large patches or between corridors (which should be <25m wide) and ‘stepping stones’ (woodland patches within 1 km of other patches). (Hooded Robin, Brown Treecreeper).</p> <p>n Maintenance of woodland remnants and isolated paddock trees: Take measures to protect woodland remnants (small isolated patches and tree clusters, road verges) and paddock trees, particularly large mature trees on fertile soils or trees known to be used by threatened species. Measures such as encouraging efforts by landholders and conservation groups should also be taken to ensure replacement of paddock trees, particularly species with potential to develop nest hollows and winter flowering eucalypts. (Painted Honeyeater, Regent Honeyeater, Superb Parrot, Swift Parrot).</p> <p>n Limit removal of live and dead timber: Maintain or enhance habitat complexity and protect large, mature eucalypts (a key resource) by limiting the removal of standing living and dead timber, particularly where other land uses, such as rural activities, road and service easements, and public land that is managed for recreation or other intensive uses. This management action should be given priority in habitat for threatened species that require structural complexity or large mature eucalypts. (Hooded Robin, Brown Treecreeper, Painted Honeyeater, Regent Honeyeater, Superb Parrot, Swift Parrot, Varied Sittella, White-winged Triller).</p> <p>n Prevention of intensive grazing: Prevent intensive grazing pressure so that habitat complexity is maintained or enhanced. This is a priority in habitat for threatened species requiring structural complexity. On rural leases, appropriate levels of stock grazing in Yellow Box – Red Gum woodland will be encouraged through LMAs. (Hooded Robin, Brown Treecreeper, White-winged Triller, Superb Parrot).</p> <p>n Maintenance of patches of shrubs or eucalypt regrowth: Maintain or enhance habitat complexity by maintaining patches of shrubs and/or eucalypt regrowth. Priority should be given to habitats for threatened species requiring these features for nesting and shelter purposes. (Hooded Robin, Varied Sittella).</p>	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Threatened species continue to survive in the ACT. ■ In addition to criteria for 2 Protection (above): extent to which important fauna habitat is protected by reservation or off-reserve protection agreements. ■ Extent to which ecological connectivity is maintained or enhanced. ■ Actions to address maintenance of woodland remnants, isolated paddock trees and patches of shrubs (particularly threatened species habitat) are in place and being implemented. ■ Priority threats (removal of live timber, removal of dead standing and fallen timber, intensive grazing, inappropriate fire regimes) to habitat complexity are substantially reduced or decreasing. ■ Area of lowland woodland subject to restoration/regeneration management that incorporate identified habitat requirements.

8. Threatened, Declining or Uncommon Animals (Continued)

Key Action	Performance Criteria
<ul style="list-style-type: none"> ■ Regeneration of habitat: include identified habitat requirements into programs of woodland regeneration and restoration (e.g. regenerating or planting trees with potential to develop nest hollows and food trees such as winter-flowering eucalypts, planting shrub patches). Undertaking regeneration or restoration activities that enhance connectivity between woodland areas. (Hooded Robin, Brown Treecreeper, Painted Honeyeater, Regent Honeyeater, Superb Parrot, Swift Parrot, Varied Sittella, White-winged Triller). ■ Minimisation of adverse effects of fire: ensure planned burns are carefully managed, particularly in or near areas of faunal significance. The timing and intensity of planned burns should take into account adverse effects on fauna, particularly threatened and declining species, such as disruption of breeding. Areas identified as threatened species habitat should receive the same protective measures against unplanned fire as for other identified areas of fauna significance. (Hooded Robin, Brown Treecreeper, Painted Honeyeater, Regent Honeyeater, Superb Parrot, Swift Parrot, Varied Sittella, White-winged Triller). ■ Minimise nest hollow competition: Discourage use of nesting sites by introduced species such as the Common Starling (<i>Sternus vulgaris</i>), Common Myna (<i>Acridotheres tristis</i>) European Honey Bee (<i>Apis mellifera</i>) through research and, where practical, pest control techniques. The scope for placement of nest boxes should be evaluated. (Brown Treecreeper, Superb Parrot). 	
<p>MONITORING AND RESEARCH</p> <ul style="list-style-type: none"> ■ Monitor threatened, declining and rare species, to determine their long-term trend and status in the ACT and region through compilation of observations and in some cases systematic surveys. ■ Encourage and support the continuation of the Canberra Ornithologists Group's monitoring programs, particularly with regard to threatened and declining species. ■ Encourage and support research into the ecology and conservation requirements of threatened species, and facilitate the incorporation of research results into lowland woodland management. Research priorities for threatened species include: <ul style="list-style-type: none"> ❑ specific habitat requirements and key resources (such as Mistletoe or nesting hollows), including distribution of key habitats; ❑ effects of habitat modification, fragmentation and land use practices such as grazing; ❑ investigation of movement patterns, particularly in relation to flowering patterns and nectar productivity of key eucalypts and other key resources such as nesting sites ('landscape' species); ❑ breeding success, survival and recruitment rates of breeding populations; ❑ dispersal of young birds (particularly in fragmented environments); 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Research and monitoring are undertaken and the results used to inform managers of measures to improve ecological condition and habitat qualities (includes reducing competition for nest hollows). ■ COG monitoring programs continue.

8. Threatened, Declining or Uncommon Animals (Continued)

Key Action	Performance Indicators
<ul style="list-style-type: none"> <input type="checkbox"/> nest predators and rates of predation; <input type="checkbox"/> competition with introduced pests for nest hollows; <input type="checkbox"/> evaluation of threats to important sites; <input type="checkbox"/> assessment of potential for augmenting local populations through reintroductions, which could accelerate the extension of the range of the species and increase the probability of long-term viability of local populations; <input type="checkbox"/> interactions with the other species (such as Mistletoebird and Painted Honeyeater); and <input type="checkbox"/> distribution and ecology of mistletoes. 	
<p>NATIONAL AND REGIONAL COOPERATION</p> <ul style="list-style-type: none"> ■ Maintain links with, and participate in national recovery efforts for threatened woodland species to ensure that ACT conservation actions are coordinated with national programs (EACT). ■ Liaise with the NSW Department of Environment and Conservation with the aim of achieving a coordinated, regional approach to the conservation of threatened bird species, especially in relation to cross-border planning issues (EACT). 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Participation in national recovery programs. ■ ACT and NSW conservation activities are coordinated to support regional conservation outcomes.
<p>EDUCATION</p> <ul style="list-style-type: none"> ■ Raise community awareness through community liaison and public education, with the aim of fostering protection of threatened woodland species and their habitats (EACT). 	<p>2004–2006</p> <ul style="list-style-type: none"> ■ Advisory materials available for the public, landholders and for use in programs for woodland regeneration and restoration.

ABBREVIATIONS:

EACT	Environment ACT
NSW	Relevant NSW government agencies primarily the Department of Environment and Conservation
Cwlth	Commonwealth agencies responsible for managing areas of National Land in the ACT (Department of Defence, National Capital Authority, CSIRO)
ACTPLA	ACT Planning and Land Authority
LMA	Land Management Agreement (for rural leases in the ACT)
MOU	Memorandum of Understanding
CMN	Conservation Management Network

6.3

Policy Guidelines for Woodland Conservation in the ACT

6.3.1 A Comprehensive, Adequate and Representative Reserve System

ACT Government policies for conservation of the diversity of ecological communities in the Territory are set out in documents such as the Territory Plan, *The ACT Nature Conservation Strategy* (ACT Government 1998d), and specifically for Yellow Box–Red Gum Grassy Woodland, Action Plan 10 (ACT Government 1999a). Statements in these documents point towards a system of protection for the ACT that places its natural environments within a regional context and reflects national priorities. The latter are contained in several inter-governmental agreements: a National Reserve System (Commonwealth of Australia, 1999), a *National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia 1996) and the *National Forest Policy Statement* (Commonwealth of Australia, 1992) and related documentation.

The *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia* (JANIS 1997) (the CAR criteria) was produced to meet a commitment in the *National Forest Policy Statement* (NFPS) for the establishment of a national forest reserve system. While the CAR criteria were initially developed in the context of conserving forest ecosystems, the principles are generic in nature and can be applied generally to establishment of a CAR reserve system, together with other protection measures, for conservation of biodiversity. Frequently quoted criteria for a CAR system for forest ecosystems (and in the context of this *Strategy*, lowland woodland ecosystems) are:

- as a general criterion, 15% of the pre-1750 distribution of each forest ecosystem should be protected in the CAR reserve system;
- all remaining occurrences of rare and endangered forest ecosystems should be reserved or protected by other means as far as is practicable;
- the reserve system should seek to maximise the area of high quality habitat; and
- in fragmented landscapes, remnants that contribute to sampling the full range of biodiversity are vital parts of a forest reserve system.

The CAR principles have been adopted by the Australia and New Zealand Environment and Conservation Council (Commonwealth of Australia 1999) as *Australian Guidelines for Establishing the National Reserve System* (NRS), although a specific percentage target is not included. Definitions of the terms Comprehensive, Adequate and Representative are given together with guidelines for identifying and selecting protected areas. These guidelines have been used throughout this *Strategy* at a scale appropriate to the relatively small size and location of the ACT within the South Eastern Highlands bioregion (Environment Australia 2000). In doing so, it is recognised that the ACT's protected areas can be only a contribution to the regional conservation needs of the Yellow Box–Red Gum grassy woodland endangered ecological community and cannot be relied upon to ensure that options for application of CAR criteria at a bioregional scale are fully exploited.

Socio-economic considerations may preclude protection of all unprotected occurrences of Yellow Box–Red Gum grassy woodland in the ACT, although advantage can be taken of some urban planning opportunities to modify land use proposals that would otherwise result in loss of small areas of Yellow Box–Red Gum grassy woodland. The fragmented nature of much of the remaining unprotected Yellow Box–Red Gum grassy woodland points to off-reserve conservation measures as a supplementary option to pursue. The guidelines for the NRS program (Commonwealth of Australia 1999) call for decision making processes to integrate long-term and short-term environmental, economic, social and equity considerations; and endorses the principle of 'least cost', where an optimal reserve configuration can be established with the minimum economic and social cost to the community.

6.3.2 Other Policy Guidelines for Woodland Conservation in the ACT

In addition to guidelines for a CAR reserve system, policy frameworks for the upper Murrumbidgee River catchment as part of the Murray–Darling Basin are relevant to nature conservation in the ACT region.

Targets of the Integrated Catchment Management Policy for terrestrial biodiversity in the Murray Darling Basin are: maintaining key ecological processes; maintaining or re-establishing viable populations of native species and the integrity of ecological communities (especially vegetation); and controlling threats to biodiversity (MDBC, 2001). The ACT is a

participant in the Murray Darling Basin initiative, and is involved in a number of programs of relevance to the ACT, such as the sustainable rivers audit.

At the sub-regional level, the *Murrumbidgee Catchment Blueprint* (Murrumbidgee Catchment Management Board 2003) has been prepared to satisfy legislative requirements in the NSW *Catchment Management Act 1989* and in response to arrangements under the National Action Plan for Salinity and Water Quality (NAP). Although the *Murrumbidgee Catchment Blueprint* is inclusive of the ACT at the broader catchment level, the ACT has a separately identified component that reflects the ACT's different governmental arrangements, land tenure system, and urban focus.

The ACT targets, actions and activities have been prepared through a process of community and government consultation. They provide direction for future natural resource management investment and will enable the ACT to assign funding to address issues of concern to the Territory as well as to participate in projects spanning more than one catchment. However, each jurisdiction needs to deal with natural resource management within its own policy and planning framework.

For the Murrumbidgee Catchment as a whole the target of the *Blueprint* is to manage for biodiversity conservation a minimum of 30% of the area of each of the native vegetation communities of the Murrumbidgee Catchment by 2012 and improve the extent, diversity and condition of inland aquatic ecosystems. As noted in section 2.3.3 this target cannot be reached for Yellow Box–Red Gum Grassy Woodland in this region, although it is achievable at the much smaller scale of the ACT. The opportunity still exists for the ACT to contribute proportionately more than the region as a whole to conservation of Lowland Woodland and the plants and animals that depend upon its habitats.

In the ACT component of the *Blueprint*, (the *ACT Natural Resource Management Plan* (ACT NRM Board 2003)), the targets relevant to lowland woodland conservation are:

- n by 2006, have in place biodiversity targets that enable on-going assessment and protection of biodiversity values;
- n all protected areas of the ACT managed for the conservation of ecosystems and ecological processes 100% of the time;

- by 2005, all significant remnant vegetation on rural land in the ACT is managed to maintain and enhance its biodiversity values;
- by 2005, have in place and progressively implement wetland and riverine management policies and management actions to meet the determined aquatic ecosystem targets; and
- by 2005 develop and adopt targets for urban ecological function.

The first three of the ACT targets present a challenging framework in which to implement the *Lowland Woodland Conservation Strategy*.

Nevertheless there is a good basis from which to start as there are considerable areas of lowland woodland already protected within nature reserves, and in other areas, some mechanisms for improved biodiversity conservation outcomes are available to assist land holders.

6.3.3 The ACT Contribution to the Establishment of a Comprehensive, Adequate and Representative Reserve System for Lowland Woodlands

In applying the key principles from the NFPS and NRS to identifying an ACT contribution to a CAR reserve system, the following definitions has been used:

Comprehensiveness—sampling the full range of communities/ecosystems.

- Comprehensiveness should be addressed in a biogeographical context (i.e. using IBRA regions (Thackway and Cresswell, 1995)) and at an appropriate scale. Fifteen percent of pre-European extent of each forest ecosystem is cited as a preferred minimum representation for a forest reserve system (Commonwealth of Australia 2001).

- All remaining occurrences of endangered ecosystems should be reserved or protected by other means as far as is practicable.

An endangered ecosystem is one where its distribution has contracted to less than 10% of its former range, or the total area has contracted to less than 10% of its former area, or where 90% of its area is in small patches which are subject to threatening processes and unlikely to persist.

Flexibility in the application of reserve criteria is needed to ensure that the reserve system delivers optimal nature conservation outcomes as well as acceptable social and economic outcomes. Reserve design criteria should, therefore, be considered as

guidelines rather than mandatory targets. For example, the effort to achieve reservation of all occurrences of an endangered community may reach a point of diminishing return and nature conservation objectives may be more efficiently and effectively achieved through other strategies. If socio-economic impacts are such that trade-offs are required to meet all criteria for reserve design, optimisation of biodiversity protection should take precedence.

Adequacy—the maintenance of ecological viability and integrity of populations, species and communities.

- Extent and replication of samples of populations, species and communities in the reserve system across their range such that their viability is ensured, particularly as a safeguard against catastrophic events (e.g. the 2003 bushfires). Two key principles are: (a) the greater the extent reserved, the more likely that the ecological functioning and species composition of an ecosystem will be maintained; (b) ecosystems are represented within the protected area network at more than one site.

Decline in range and area of the community (reserved or otherwise) is one of the reasons that Yellow Box–Red Gum grassy woodland is endangered. It follows that adequacy is a limiting factor in the ACT's contribution to a bioregionally adequate reserve system. A systematic approach is called for to compensate, involving reservation where possible and an increased emphasis on off-reserve conservation measures such as protection of habitat links, special protection measures for occurrences on private land and sympathetic management of adjacent land.

Representativeness—sample areas included in the reserve system should reasonably reflect the biotic diversity of the communities.

- Consider the range of species that comprise the community, especially those that depend on reservation for protection. The objective is to maximise their viability in a region through adequate reservation, not reserve every ecosystem in which they have been recorded. Consider the range of floristic and structural mixes that are found in the community.

In the ACT there is scope for greater representation of Yellow Box–Red Gum grassy woodland in the reserve system, with strong complementary measures for off-reserve occurrences. The ACT reserve system should sample Yellow Box–Red Gum grassy woodland as a component of the regional ecosystem. Representative

coverage of regional ecosystems can only be satisfied at a bioregional scale.

In the context of this *Strategy* the terms 'comprehensive', 'adequate' and 'representative' need to be described in ways relevant to the level and scale of decision-making by government and other stakeholders in the ACT. Planning and conservation issues outlined in Chapter 5 have been reviewed and reference made to the scope of explanations for the terms included in the NRS guidelines to derive the following elements for an assessment of the ACT's contribution to a CAR reserve system:

A 'comprehensive' reserve system will include the full range of lowland woodland types in the ACT including:

- Yellow Box–Red Gum grassy woodland (endangered ecological community) across the full range of altitude, soil types, and aspect;
- the range of other woodland types across the full range of altitude, soil types, and aspect; and
- examples of Snow Gum (*Eucalyptus pauciflora*) lowland woodland.

An 'adequate' reserve system will include areas of woodland that will retain viable ecological communities and populations of their component species including:

- large areas of Yellow Box–Red Gum grassy woodland and other types of lowland woodland preferably with small perimeter/area ratio;
- replicated samples of Yellow Box–Red Gum grassy woodland and other lowland woodland types; and
- woodland areas that are well connected to ensure ecological processes are maintained to the greatest possible extent (see the following section).

A 'representative' reserve system that encompasses the diversity of species and habitats including:

- threatened and declining woodland birds and other animals;
- threatened and declining plants; and
- the geographic range of species.

Each of these (nine) CAR elements have been assessed in terms of the degree to which they are demonstrated or included in the five woodland complexes. This assessment together with a summary of the priority tasks necessary to achieve an improved CAR reserve system for the ACT are outlined in Table 6.2.

The extent to which the priority tasks are addressed will be a measure of the contribution made by the ACT nature reserve system and off-reserve measures in reaching towards the Vision and Goals identified for this *Strategy*. A strong, representative reserve system will be complemented by off-reserve conservation measures. The latter should be aimed at improving ecological connectivity, providing opportunities for restoration and regeneration of woodlands, and conserving habitat for those species that range widely across the landscape either in migratory movements, in response to climatic conditions or because home ranges are larger than the protected areas system.

6.3.4 Maintaining and Enhancing Habitat Connectivity

Broad landscape level priority connections (corridors) to provide for wildlife movement are shown in Figure 6.1. The key connections are:

- Hall–Kinlyside–Mulligans Flat–Gooroo–Majura Valley–Jerrabomberra Valley;
- Jerrabomberra Valley to Rob Roy Range;
- Belconnen Hills to the lower Molonglo River; and
- across the rural landscape by connecting woodland fragments.

These connections aim to maintain and enhance links between the large woodland units (both within the ACT and to adjacent lands in NSW), maintain key north–south corridors on each side of the city and an east–west corridor around the north of the city, preserve the links to the south of the city, maintain links with rural woodland fragments and maintain links to other natural ecosystems (natural grasslands and forests). These broad, landscape scale connections serve to assist the assessment of ‘connectivity’ value of individual patches and the requirements for rehabilitation of areas to enhance connectivity.

6.4

The State of Protection of Yellow Box–Red Gum Grassy Woodland and Other Lowland Woodlands in the ACT

Figures included in Action Plan 10 for the pre-1750 and late 20th century extent of Yellow Box–Red Gum grassy woodland indicated that about one quarter (7888 ha) of the original 32,000 ha of this woodland type had not been cleared for urban development and rural uses (ACT Government 1999a). Of this remaining area of woodland about 21% was protected within nature reserves and another 36% was under some form of protection through land use planning controls.

Although this general picture has not changed significantly, more recent ecological surveys and the analyses undertaken on the data, as well as the addition of secondary grassland in the inventory of lowland woodland have resulted in an increase in the estimated remaining area of Yellow Box–Red Gum grassy woodland, some of which is protected.

As a result of this new work:

- 5436 ha of secondary grassland (derived from Yellow Box–Red Gum and other woodland communities) have been recognised in this inventory of ACT woodlands;
- 792 ha of land have been surveyed and added to the woodland inventory; and
- mapping of woodland areas (polygons) reflect more accurately homogeneity of vegetation with the result that some areas previously defined as the Yellow Box–Red Gum community are now allocated to other woodland types (and *vice versa*).

Secondary grasslands have been included because they are derived from the original Yellow Box–Red Gum grassy woodland when the tree canopy is removed or suffers die-back. These areas still retain native grasses, forbs and shrubs typical of Yellow Box–Red Gum grassy woodland and may still retain scattered trees. In the landscape, secondary grasslands can often be important in maintaining connectivity between treed areas or, if trees are allowed to return, may develop into ecologically valuable examples of Yellow Box–Red Gum grassy woodland or other lowland woodland types.

A summary of the estimated areas of woodland shown in Figures 5.1–5.5, as at 1 October 2003, is in Table 6.3. It allows an assessment to be made of the state of woodland conservation across the ACT.

Table 6.2: Analysis of Elements for a CAR System of Protected Woodlands for the ACT

	Gungahlin	Majura Valley–Kowen	Callum Brae–Jerrabomberra VALley	Tuggeranong–Naas	North Murrumbidgee–Molonglo	Priority tasks to improve CAR system in ACT	
Comprehensive	%of complex in protected areas	YBRG: 53% Other woodlands: 15%	YBRG: 30% Other woodlands: 2%	YBRG: 37% Other woodlands: 58%	YBRG: 17% Other woodlands: 12%	YBRG: 13% Other woodlands: 37%	<ul style="list-style-type: none"> Woodlands other than YBRG are poorly protected in the Majura Valley–Kowen complex (but much is managed under an MOU with Dept of Defence)
	YBRG range	Existing elevation range: 600–800m Protected area range: 600–700m Territory Plan range: 650–800m Inadequately protected: 650–750m	Existing elevation range: 550–800m Protected area range: 550–700m Territory Plan range: 550–750m Inadequately protected: 700–750m	Existing elevation range: 550–750m Protected area range: 650–750m Territory Plan range: 550–600m Inadequately protected: 550–650m	Existing elevation range: 500–1050m Protected area range: 500–950m Territory Plan range: 550–1050m Inadequately protected: 650–750m	Existing elevation range: 500–750m Protected area range: 500–750m Territory Plan range: 500–700m Inadequately protected: 550–600m	<ul style="list-style-type: none"> Attention should be given to including YBRG woodland at the lower elevations in the protected area system, particularly in Callum Brae–Jerrabomberra Valley and Gungahlin complexes. Restoration of YBRG woodland in some secondary grassland areas
	Other Woodland range	Existing elevation range: 550–850m Protected area range: 600–700m Territory Plan range: 600–850m Inadequately protected: 650–750m	Existing elevation range: 550–800m Protected area range: 550–700m Territory Plan range: 550–750m Inadequately protected: 550–750m	Existing elevation range: 600–800m Protected area range: 650–800m Territory Plan range: 650–800m Adequately protected	Existing elevation range: 550–1250m Protected area range: 550–1250m Territory Plan range: 550–1200m Adequately protected	Existing elevation range: 450–750m Protected area range: 450–750m Territory Plan range: 500–700m Inadequately protected: 550–650m	<ul style="list-style-type: none"> Attention should be given to including other woodland types at the lower elevations in the protected area system, particularly in Majura Valley–Kowen complexes. Restoration of woodlands in some secondary grassland areas
	Eucalyptus pauciflora woodlands	Several areas of lowland Snow Gum woodland in Kinlyside (total 4.6 ha) and Kenny have no protection. One area in reserve (0.3 ha).	One small remnant of moderately modified woodland remaining in rural lease (0.3 ha), other area in rural lease with exotic understorey.	None remaining.	Large areas of partially and moderately modified Snow Gum woodland (1363 ha) remain at higher altitudes (700–1100 m).	Example at Aranda Bushland (0.6 ha) is protected. Another small fragment under threat from road construction.	<ul style="list-style-type: none"> Protect areas of lowland Snow Gum woodland in Gungahlin and retain other remnants where possible. Maintain higher elevation Snow Gum woodlands in the Naas and Tidbinbilla valleys.
Adequate	Size	Woodlands at Gooroo represent one of the largest areas remaining in the ACT in good condition and due to large size provide key habitat for many species.	Large areas of woodland on Majura Field Firing Range are not protected but are not under immediate threat. Small and isolated remnants in Kowen could be linked to dry forest on the escarpment.	Woodlands at Callum Brae represent one of the largest areas remaining in the ACT in good condition and due to large size provide key habitat for many species.	Largely intact landscape, well connected to large forest areas.	Woodland patches lie within a matrix of rural land with scattered trees. Some relatively large areas on rural leased land offer opportunities for rehabilitation of habitat diversity.	<ul style="list-style-type: none"> Adding large key habitat areas to the nature conservation estate at: Kinlyside, Gooroo, East Majura Valley, and Callum Brae. Enhance the conservation value of smaller fragments in the Nth Murrumbidgee–Molonglo complex by enlarging and linking them through habitat restoration projects.
	Replication	Protection of woodlands in the Kinlyside and Gooroo areas would contribute significantly to replication of the range of woodland types in the northern part of the ACT	Woodlands on Ainslie–Majura and the Majura Field Firing Range represent replicates of woodland in this complex. Woodland patches in Kowen contribute little to replication objectives.	Samples are replicated across this complex.	Replication would be improved by protecting Callum Brae woodlands. Much of the diversity of woodlands in this complex is on rural lease, with Land Management Agreements, and are not subject to immediate threat.	Much of the woodlands in this complex are on rural lease, with Land Management Agreements, and are not subject to immediate threat.	<ul style="list-style-type: none"> Existing protected areas provide reasonable replication of YBRG and other woodlands types. Any additional areas that are protected or managed for conservation will increase the extent of replication. Rural areas in Naas valley assist replication of woodland areas in southern part of range.
	Connectivity	Opportunity to secure good connectivity from Hall to Mulligans Flat and Gooroo and on to the Majura Valley. Need to plan for connectivity to adjacent NSW.	North-south connectivity good. Need to improve connectivity from Majura Field Firing Range–Newline quarry–Jerrabomberra Valley; and from Gooroo to Majura. Only limited opportunities to redress poor connectivity in Kowen.	North-south connectivity good. Need to improve connectivity across woodland and native grassland ecotone in the valley. Connect Callum Brae to Majura and Rob Roy.	Good connectivity between remnants in rural areas and into Namadgi National Park, and east into NSW (to the Tinderry Mtns).	Opportunities to improve connectivity across Belconnen Hills and to the Lower Molonglo River.	<ul style="list-style-type: none"> Improve connectivity across ACT by linking woodland between: <ul style="list-style-type: none"> rural areas and surrounding areas of NSW; Hall–Kinlyside, Mulligans Flat, Gooroo, Majura Majura Field Firing Range, Newline quarry, Jerrabomberra Belconnen Hills, and to the Molonglo River via Kama.
Declining & threatened	birds	Key habitat protected in Mulligans Flat. Other key habitat areas at Gooroo and Hall/Kinlyside. Mature healthy trees across north of complex provides habitat for semi-nomadic species.	Key habitat at Ainslie–Majura and at Majura Field Firing Range. Linking habitat at Newline quarry not protected—could serve as ‘stepping stone’ connection to south.	Large part of complex (particularly woodlands at Callum Brae) is key habitat for threatened and declining birds, is part of land use study of Jerrabomberra valley.	Key habitat in Castle Hill area supporting many threatened and declining bird species. This area is subject to Land Management Agreement.	Habitat at Hall/Kinlyside includes part of breeding range for Superb Parrot. Mature healthy trees enhance connectivity between Molonglo River–Glenloch Interchange–Black Mountain and Bruce/O’Connor Ridge and support semi-nomadic species and honeyeater migration route.	<ul style="list-style-type: none"> Improve conservation of threatened and declining birds by: <ul style="list-style-type: none"> conserving large patches providing key habitat. improving connectivity between complexes, and between remnants and river corridors, and particularly bird migration routes. maintaining mature trees across rural and urban areas, particularly in northern ACT, as habitat for ‘whole of landscape’ species. avoid loss of woodland habitat if likely to exacerbate bird declines. assess role of lower quality woodlands as habitat & reserve buffers.
	plants	Austral Toadflax population is within Canberra Nature Park. Tarengo Leek Orchid in Hall Cemetery is vulnerable to inadvertent damage.	No known populations of declining or threatened plants.	Extensive population of Button Wrinklewort in Stirling Park is under threat from possible development by the Commonwealth.	Austral Toadflax populations protected in Tidbinbilla Nature Reserve.	Small Purple Pea population secure in Canberra Nature Park.	<ul style="list-style-type: none"> Establish a new site adjacent to the Hall Cemetery as provided for in the Hall Master Plan 2001. Secure protection of the Button Wrinklewort population and YBRG woodland in Stirling Park.
	Geographic range of species	Mature paddock trees and ground habitat important for Superb Parrot (breeding areas) in the Murrumbateman–Hall area. The complex is the northern-most extent of lowland woodland in the ACT.	Stand of Black Gum (edge of range) on roadside (Kowen) is unprotected. Complex contains part of the breeding range of the Regent Honeyeater. Protected areas include none of the YBRG woodland/grassland interface.	Protected areas include part of the central ACT woodland complex and none of the YBRG woodland/grassland interface.	This complex is the southern-most extent of lowland woodland in ACT Upper elevation Snow Gum woodlands & YBRG on rural leases have LMAs. River Red Gum near Mt Tennant is secured by fencing from grazing.	Mature paddock trees and ground habitat important for Superb Parrot in the Murrumbateman–Hall area. White Box on ‘Huntly’ is secured by fencing from grazing. No YBRG/grassland interface protected.	<ul style="list-style-type: none"> Improve protection of lower elevation Snow Gum woodlands across geographic range. Improve protection to lower elevation YBRG woodlands at the grassland interface across the geographic range. Maintain/replace paddock trees in landscape restoration projects.

Table 6.3: Summary of Lowland Woodland Data Showing Areas Remaining Under Various Categories of Land Use

All figures hectares (%)	Estimated Area of Yellow Box-Red Gum Grassy Woodland and Other Woodland Types (partially & moderately modified)										Estimated Area of Former Woodland (all types) (substantially or severely modified)	
	Total area (from Tables 5.4-5.8)		Area in Public Land (Nature Reserve)		Area under HRB*, MtnB*, Rcor*, UOS* (Territory Plan), or Designated Area (National Capital Plan)		Area under Broadacre Rural & Plantation Forestry land use (Territory Plan)		Area under Urban uses (Residential, Tourist, Industrial, Commercial, and other urban uses (Territory Plan))		Former YBRG woodland	Other former woodland
	YBRG woodland	Other woodland	YBRG woodland	Other woodland	YBRG woodland	Other woodland	YBRG woodland	Other woodland	YBRG woodland	Other woodland	Former YBRG woodland	Other former woodland
Total ACT (all complexes)	10865 (100)	13100 (100)	2940 (100)	1990 (100)	7035 (100)	8500 (100)	2990 (100)	3980 (100)	840 (100)	575 (100)	5955 (100)	7075 (100)
Gungahlin	1920 (17.7)	1530 (11.7)	1015 (34.6)	25 (11)	1250 (17.8)	913 (10.8)	< 5 (0.1)	50 (1.3)	665 (79)	530 (92.5)	780 (13.1)	205 (2.9)
Majura-Kowen	1560 (14.4)	1715 (13.1)	460 (15.7)	35 (1.7)	640 (9.1)	130 (1.5)	885 (29.6)	1570 (39.4)	35 (4.1)	10 (1.4)	850 (14.2)	775 (10.9)
Callum-Brae-Jerrabomberra	1040 (9.6)	570 (4.3)	390 (13.2)	335 (17.0)	490 (6.9)	430 (5.1)	460 (15.4)	130 (3.3)	95 (11.4)	5 (0.9)	600 (10.1)	115 (1.6)
Tuggeranong-Naas	5405 (49.7)	8255 (63.0)	950 (32.5)	995 (50.5)	4095 (58.2)	6395 (75.2)	1275 (42.7)	1835 (46.1)	40 (4.5)	20 (3.3)	2080 (34.9)	3060 (43.2)
North Murrumbidgee-Lower Molonglo	940 (8.6)	1040 (7.9)	125 (4.2)	390 (19.3)	630 (7.4)	630 (7.4)	370 (12.3)	395 (9.9)	10 (1.0)	10 (1.9)	1645 (27.7)	2920 (41.3)

*HRB: Hills, Ridges & Buffers; MtnB: Mountain and Bushlands; Rcor: River Corridors; *UOS: Urban Open Space

Using the estimate by Landsberg (in ACT Government 1999a) that the pre-1750 extent of Yellow Box–Red Gum grassy woodland was about 32 000 ha, it is possible to construct a picture of what now remains. The equivalent estimate for the ACT and region is about 295 000 ha (25 200 ha remaining) (National Land and Water Resources Audit 2002, p.177s). This provides a context for decisions on any proposals to extend protection of the endangered ecological community, other lowland woodlands and the plants and animals that depend upon the habitats these woodlands provide.

Significant conclusions for the ACT include:

- (a) About 10 865 ha of Yellow Box–Red Gum grassy woodland (partially or moderately modified) are now left in a condition that meets the definition of this endangered ecological community. This represents 34% of the original area in the ACT.
- (b) In the regional context, this remaining area of Yellow Box Red Gum grassy woodland represents about 3.7% of the original area (295 000 ha) and about 43% of what is left in 2003 (25 200 ha) (National Land and Water Resources Audit 2002).
- (c) About 5955 ha of former Yellow Box–Red Gum grassy woodland (substantially or severely modified) are now left. This represents 18.5% of the original area in the ACT.
- (d) By deduction about 15 000 ha of former Yellow Box–Red Gum grassy woodland have been destroyed during the development of Canberra or as a result of other land uses. This represents about 47% of the original area.
- (e) There are about 13 100 ha of other lowland woodland communities (partially or moderately modified) now left. About 7075 ha of other former woodland types are substantially or severely modified.
- (f) 2940 ha (27%) of the remaining Yellow Box–Red Gum grassy woodland and 1900 ha (15.2%) of other lowland woodland communities are protected within Public Land (Nature Reserve) areas. Public Land (Nature Reserve) may occur in a range of land use categories set out in the *Territory Plan*.
- (g) About 7035 ha (65%) of the remaining Yellow Box–Red Gum grassy woodland (10 865 ha) and 8500 (65%) of other lowland woodland communities (13 100 ha) are protected by virtue of their location within land use categories that do not permit clearing for urban and similar activities under either the Territory Plan (Hills, Ridges and Buffers, Mountains and Bushlands, and River Corridors (including Public Land (Nature Reserve) ((f) above)) and the National Capital Plan (Designated Areas).
- (h) The Yellow Box–Red Gum grassy woodland protected in the land use categories outlined in (g) above (7035 ha) represents about 22% of the original extent (32 000 ha) in the ACT of this endangered ecological community. Of this woodland, about 18% is in Gungahlin, 9% in the Majura valley, 7% in the Callum Brae Jerrabomberra area and 66% in rural areas south and west of Canberra.
- (i) Of the remaining Yellow Box–Red Gum grassy woodland in the Gungahlin, Majura–Kowen and Callum Brae–Jerrabomberra complexes, 65%, 41% and 47% respectively are protected in the land use categories outlined in (g) above.
- (j) About 2990 ha of Yellow Box–Red Gum grassy woodland and 3980 ha of other lowland woodland communities (partially or moderately modified) are located in land shown as Broadacre and Rural under the Territory Plan (including some areas that are Public Land (Nature Reserve)). These areas represent 28% and 30%, respectively, of the remaining woodlands of these types. Some of these areas of woodland are under long term rural leases (99 or 20 years) and Land Management Agreements (LMAs) exist to ensure conservation values are retained (see Chapter 5 for more information on LMAs). Other areas are subject to MOUs.
- (k) Yellow Box–Red Gum grassy woodland and other lowland woodland communities are protected within Public Land (Nature Reserve) or related land use categories (see (g) above) in similar proportions to their representation in the five complexes described in Chapter 5, except for under representation of other woodland types in the Majura–Kowen complex.
- (l) About 840 ha of Yellow Box–Red Gum grassy woodland and 575 ha of other lowland woodland communities (partially or moderately modified) are located on land identified in the Territory Plan as urban or related land use categories. This category includes areas that have not yet been developed. These areas represent 7.8% and 4.4%, respectively, of the remaining woodlands of these types.
- (m) Of the Yellow Box–Red Gum grassy woodland that is subject to the urban land use policies of the Territory Plan (l above) (mostly for residential development purposes), 665 ha (79%) is in

Gungahlin, and 95 ha (11.4%) is in Callum Brae–Jerrabomberra.

- (n) In north Gungahlin, about 330 ha of Yellow Box Red Gum grassy woodland and secondary grassland and 500 ha of other woodlands types will be affected by development of new suburbs and urban infrastructure consistent with the Structure Plan for North Gungahlin.
- (o) Over half of the remaining Yellow Box–Red Gum grassy woodland (6300 ha (58%)) is located in rural and other non-urban areas south and west of Canberra in the Naas, Molonglo and Murrumbidgee River catchments. Public land (Nature Reserve) protects 1075 ha (17%) of this.

6.4.1 Recent Actions to Improve Conservation of Lowland Woodland in the ACT

Since the first Action Plans for Yellow Box–Red Gum grassy woodland and component threatened species were adopted, beginning in 1997, there have been several Government decisions that implemented some of the priority actions identified in these plans. These are:

- Protecting about 114 ha of Yellow Box–Red Gum grassy woodland by adding to existing nature reserves: (Tuggeranong Hill (13 ha), Mulligans Flat (19 ha) and Mt Majura (20 ha) (Territory Plan Variation Number 182, April 2002), and Mugga Mugga (52 ha) (Territory Plan Variation Number 209, December 2003);
- Protecting Snow Gum woodland at Aranda Bushland (Territory Plan Variation Number 182, April 2002);
- Protecting 19 ha of substantially modified woodland in Urban Open Space at North Watson;
- Undertaking planning studies in the Hall–Kinlyside, East Gungahlin (Gooroo), and Callum Brae–Jerrabomberra areas, including evaluation of opportunities for protecting significant areas of Yellow Box–Red Gum grassy woodland and other woodland types;
- Announcing (May 2003) the intention to protect in nature reserves about 1000 hectares of lowland woodland at Gooroo (east Gungahlin) and Callum Brae (Jerrabomberra Valley), including extensive areas of partially modified Yellow Box–Red Gum grassy woodland. Data included in Table 6.2 recognises this intention at Gooroo.

These actions build on an earlier decision by the ACT Government to protect about 500 ha of land containing Natural Temperate Grassland (an endangered ecological community) and other grassland habitat for the threatened Striped Legless Lizard (*Delma impar*) in three nature reserves in Gungahlin.

In late 2002 the Government completed a Structure Plan for North Gungahlin together with a Preliminary Assessment (PA) prepared under the *Land (Planning and Environment) Act 1991*. Preparation of the Structure Plan included information on the Yellow Box–Red Gum grassy woodland and other woodland types. The PA used information that was collected before the most recent surveys of woodland in this area.

Assessment of the most recent survey data provides more detailed information about the woodland vegetation in this part of the ACT. It adds to the description of the natural resources outlined in the PA by recognising the presence of secondary grasslands derived from the original woodlands. An analysis of the location and type of woodland in relation to the proposed Structure Plan indicates that there are about 15 patches of Yellow Box–Red gum grassy woodland (totalling about 330 ha) in the proposed development area, including a few large areas of secondary grassland (totalling about 180 ha) that were not previously identified in the PA. Other woodland types (partially or moderately modified) cover an area of about 500 ha, and there are about 195 ha of substantially or severely modified vegetation. The patches of woodland are distributed across the north Gungahlin area, with less modified areas on the eastern and western hill slopes. The substantially or severely modified vegetation and most of the woodland fragments are in the central area.

6.5

Measuring ACT Performance as Part of a Comprehensive, Adequate and Representative Reserve System for Yellow Box–Red Gum Grassy Woodland and Other Lowland Woodland Types

The most often quoted criterion for a comprehensive reserve system is that 15% of the pre-European extent should be the preferred minimum for a reserve system, and where practicable all remaining occurrences of an endangered ecosystem should be reserved or protected. Both criteria need to be considered in a biogeographic context and at an appropriate scale.

For the ACT the relevant context and scale is the South Eastern Highlands bioregion and the ACT and Southern Tablelands region. The remaining area of Yellow Box–Red Gum grassy woodland estimated for the ACT and surrounding sub-region is 25 200 ha or 8.5% of the pre-1750 amount (National Land and Water Resources Audit 2002). Therefore at these scales it is not possible to achieve the 15% CAR target for the region.

However if the ACT is taken alone, 10 865 ha of Yellow Box–Red Gum grassy woodland remains, of which 2 940 ha (27%) is protected within nature reserves and 7035 ha (65%) is protected by the Territory Plan land use categories: Hills, Ridges and Buffers, Mountains and Bushlands, River Corridors and Urban Open Space; and as Designated Areas under the National Capital Plan. If Yellow Box–Red Gum grassy woodland currently under Broadacre and Rural land use categories is considered, these figures rise to 10 025 ha and 92% respectively. This latter figure represents about 31% of the estimated pre-1750 extent of 32 000 ha. At this small, jurisdictional and sub-regional scale and for these groups of land use categories, the ACT clearly exceeds the 15% criterion.

Consideration of the amount of Yellow Box–Red Gum grassy woodland and other lowland woodland types by area alone is an incomplete analysis of the overall requirements for a CAR system. As Table 6.2 indicates, there are other factors and priorities for adding to the protected area system, namely ensuring that large enough habitat areas are retained for threatened and declining species, particularly birds, that connectivity across the landscape is maintained, and that special habitats (e.g. Snow Gum grassy woodlands) are protected. These issues were discussed in Chapters 3 and 4.

6.5.1 Priority Tasks to Improve Conservation of Lowland Woodland in the ACT

Priority tasks to achieve an improved comprehensive, adequate and representative reserve system are set out in Table 6.2. Making the decisions to implement any of these tasks is the responsibility of the ACT Government through its land planning and management actions. In summary the priority tasks are:

- Completing surveys of woodlands including data collection on groundlayer and understorey vegetation and habitat characteristics.
- Protecting key habitat areas in Hall–Kinlyside, Gooroo, East Majura Valley and Callum Brae, and off-reserve areas such as Castle Hill (Tuggeranong–Naas complex). (Note as a result of the Government’s May 2003 announcement, 1000 hectares of woodland at Gooroo and Callum Brae are to be protected in nature reserves).
- Providing for improved habitat connectivity for wildlife movement:
 - from Hall–Kinlyside–Mulligans Flat–Gooroo–Majura Valley–Jerrabomberra Valley;
 - from Jerrabomberra Valley to Rob Roy Range;
 - between the Belconnen Hills and the lower Molonglo River; and
 - across the rural landscape by connecting woodland fragments.
- Protecting examples of Snow Gum lowland woodland, especially ecotones between woodland and grassland.
- Protecting lower elevation woodlands particularly in the Callum Brae–Jerrabomberra, Majura Valley–Kowen, and Gungahlin complexes.
- Reviewing management of lowland woodland areas in government horse paddocks and agisted land to ensure ecological condition is improved.
- Implementing the Hall Master Plan and enlarging the Hall Cemetery so as to protect the Tarengo Leek Orchid.
- Assessing woodlands for their potential for listing on the ACT Heritage Places Register as natural heritage places.
- Protecting a more complete altitudinal range of woodlands by including secondary grassland and lower elevation woodlands in reserves.

- Establishing mechanisms to assist in the application of best practice management (CMNs, voluntary management agreements, guidelines) to facilitate conservation outcomes on reserve and off-reserve land.

Implementation of these priority actions depends upon a variety of government administrative processes.

Briefly these are:

- Preparing recommendations from the Conservator of Flora and Fauna to the ACT Planning and Land Authority (ACTPLA) for those areas that should be protected by including them in the ACT nature conservation estate.
- Concluding agreements between the Conservator of Flora and Fauna and land holders, such as Memorandums of Understanding and Land Management Agreements (for rural leases).
- Implementing best practice management in woodlands managed by Environment ACT, including Horse Holding Paddocks, Nature Reserves, as well as in areas that are agisted and managed by ACTPLA e.g. Gungahlin, Caswell Drive.
- Applying this *Strategy* and the information that it provides to future planning proposals for the ACT.
- Establishing CMNs and investigating voluntary management agreements.
- Promoting cross border cooperation amongst ACT and NSW government agencies and other stakeholders so that coordinated conservation planning and management activities maximise the opportunities to achieve regional targets for biodiversity conservation.

Future actions to improve conservation of lowland woodlands

Figure 6.1.

