



Background paper for roundtable discussion on development and implementation of an ACT Woodland Restoration Plan

Purpose of forum

To seek advice and consensus on the scope, principles and on ground priorities for management and planning activities that should be undertaken to continue to improve the quality, extent and connectivity of ACT's lowland woodland and wildlife habitat, particularly in relation to woodland birds. The roundtable will provide a focus for a woodland restoration funding bid.

What prompted the need for a roundtable discussion?

As a supplement to *Wingspan*, vol 20 (2010), Birds Australia produced a report on *Restoring Woodland Habitats for Birds*. The report both highlights the perilous existence of many of Australia's woodland birds, but also that on-ground action can make a difference to their viability. Direction on conservation actions to enhance woodland and its habitat value is a key feature of the *ACT Lowland Woodland Conservation Strategy* (2004). The roundtable is an opportunity to reflect on the effectiveness of these actions within the ACT, and to also consider the applicability of similar actions undertaken elsewhere and overviewed in the Birds Australia report.

Summary

ACT's lowland woodlands are of national significance. They are amongst the biggest, best connected, most botanically diverse examples of their type. However, they have suffered local species extinctions and declines. Further loss and fragmentation from urban expansion, over grazing, weed invasion and changed fire regimes are key threatening processes. Active restoration of the lowland woodlands has occurred over several decades and can best be built on by:

- having a whole of landscape focus;
- protecting good quality remnants and enhancing them through assisted natural regeneration, namely weed and grazing pressure control;
- undertaking small scale plantings or introduction of missing habitat elements in key locations within better quality remnants;
- undertaking of extensive restoration activities in more degraded areas to improve the size of existing remnants, improve connectivity and reduce fragmentation, target riparian and productive areas of the landscape, and improve habitat diversity and structural complexity; and
- where possible, retaining large scattered trees and regeneration of this resource across all land uses.

Recommendations

1. Action Plan 27 *ACT Lowland Woodland Conservation Strategy* should be updated.
2. The focus for largescale protection and restoration works should be the priority areas identified in map 2 (Hall-Kinlyside, Goorooyarroo, East Majura Valley, Callum Brae and Castle Hill) as well as the Naas Valley, the Murrumbidgee Corridor and the Belconnen Hills to Lower Molonglo area.
3. Natural regeneration and weed and grazing control should be the major restoration focus of reserves that already largely consist of good to moderate condition woodland.
4. Small scale plantings of up to a few hectares and introduction of missing habitat elements such as fallen timber are appropriate in reserves that have a good or moderate condition, provided the works are targeted to provide or enhance particular habitat requirements.
5. Larger scale plantings/seeding are appropriate in more heavily degraded but productive reserve areas (usually low in the landscape). The plantings should enhance the size and connectivity of remnants in priority areas and where possible incorporate paddock trees.
6. Strategic use of ParkCare and other volunteer groups should occur in the implementation of restoration actions.
7. Weed and grazing control measures should be co-ordinated with adjoining rural lessees and other neighbouring land owners or managers.
8. Restoration actions should be encouraged on rural land through the Land Management Agreement process.
9. Offsets, covenanting and/or other options for incentive payments be utilised.
10. Incentive payments should be directed towards priority restoration areas.
11. Research into the most effective measures for woodland and bird habitat restoration and management should be encouraged and supported.
12. Restoration actions should be responsive to new research findings and on the ground monitoring.
13. Success criteria should be transparent and measurable and based on relevant ecological and biophysical indicators. They must reflect the restoration goals, be responsive to restoration actions and lack ambiguity, and ideally, be relatively easy and economic to sample (Radford et. al. 2006).

1. Background Information

1.1 Lowland woodland conservation values

Lowland woodlands across temperate Australia have been extensively cleared. About half of ACT's remaining lowland woodlands are part of the White-Box-Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland community, which has been listed nationally as critically endangered. It is considered that less than 5% of the original extant of this community remains nationally, and that left is mainly in small fragmented patches less than 10 ha (Commonwealth listing advice 2006, Gibbons and Boak 2002, Davidson 2005).

In contrast to the rest of Australia, the ACT retains over a third of the original extent of Yellow Box Red Gum Grassy Woodland. The lowland woodland remaining in the ACT is outstanding in relation to:

- the large size of the remaining patches (typically greater than 100 ha);
- the high level of connectivity of lowland woodland across the landscape;
- the high botanical diversity, including many rare and threatened species; and
- their good condition in relation to the vegetation structure and regeneration and level of weed invasion.

The size and condition of the ACT remnants owes much to the lack of intensive pasture improvement and cropping in comparison to land elsewhere. This also means that woodland remnants in the remaining rural areas of the ACT are typically adjoined by native pasture and/or native pasture with partially improved pasture that retain large paddock trees. Both native pasture and paddock trees are able to support important elements of woodland biodiversity and provide the basic building blocks, both in terms of structure and species composition, for restoration activities (Dorrough et. al. 2008).

1.2 Legislation

Yellow Box – Red Gum grassy woodland was declared an endangered ecological community in 1997 under the *ACT Nature Conservation Act 1980*. The distribution of this community was mapped in the *ACT Lowland Woodland Conservation Strategy* (2004). The strategy called for a representative, adequate and comprehensive woodland reserve system and the maintenance and enhancement of connectivity. Key areas identified for conservation action included Hall-Kinlyside, Goorooyaroo, East Majura Valley, Callum Brae and Castle Hill (see Map 2). Since the completion of the Strategy the extent of lowland woodland included in the ACT reserve system has increased by about 50% from 4930 ha to around 7250 ha, incorporating several of the priority areas.

ACT legislation does provide some controls over vegetation clearing, but does not currently seek to maintain the current extent of native vegetation. Vegetation can be cleared without the need of a commensurate gain through improved vegetation management elsewhere. This inevitably raises concerns about the potential cumulative effects of small scale clearing that may result in 'the death of a thousand cuts' (Potter 2008). For example, over 1300 ha of lowland woodland occurs in areas designated for Future Urban Development as shown in the Spatial Plan.

Commonwealth approval is required for any action that may significantly impact on a matter of National Environmental Significance (NES), such as the Box Gum grassy

woodland or several lowland woodland species listed as threatened under the *Environmental Protection Biodiversity Conservation Act 1999*. As part of an approval the Commonwealth is increasingly requiring offsetting to maintain features of NES. The ACT Government is currently preparing an ACT Offset Policy which, amongst other things, would facilitate the delivery of the Commonwealth offset requirement.

1.3 Key threatening processes

Nationally, the key threats to woodland, are recognised as clearing, grazing and weed invasion. Other threats recognised nationally include salinity, nutrient enrichment, altered fire regimes and the effects of fragmentation (Commonwealth conservation advice 2006). The *ACT Lowland Woodland Conservation Strategy* described the main threats as clearing and fragmentation for urban and infrastructure development, modification of woodland composition and structure for grazing and other land uses, dieback, firewood collecting, weed invasion, fire and introduced pests and changes in native species abundance. Cats and foxes are the major predators of concern to ACT's woodland wildlife, while competition for hollows by introduced species such as Indian Myna and European Honey Bee are also of concern.

1.3.1 Kangaroo grazing

Grazing pressure from kangaroos and the degradation of woodland understorey that this may cause is increasingly being recognised as a key management issue within the ACT. The *ACT Kangaroo Management Plan* (2010) contains specific kangaroo management policies for woodlands.

1.3.2 Rabbit grazing

The Calici virus is losing its effectiveness. Since the rainfall during summer/autumn 2007 rabbit populations in the ACT have shown a dramatic increase on both public and adjoining leased rural land. This year has been another favourable year for rabbits. It is essential that rabbit management is carried out as an integrated program at the landscape scale in order to achieve effective, long lasting control of rabbit populations. Follow up to primary rabbit control programs are essential to prevent any rabbits that remain from rapidly breeding up again. Rabbit control involves harbour removal (mostly woody weeds), warren ripping, fumigation and poison baits. Over the last two years \$250,000 has been spent controlling rabbits in the woodland reserves of Callum Brae, Majura/Mt Ainslie, Mt Painter, the Pinnacle and Red Hill. The level of funding into the future is currently uncertain.

1.3.3 Fuel reduction/simplification of habitat

Much of Canberra Nature Park consists of reserved hills surrounded by housing. The lower slopes adjoining houses have deeper soils and retain more moisture and are hence the prime bird habitat. This habitat has increasingly been simplified by removal of shrubs and understorey elements to reduce fuel loads as part of fire management. Hazard reduction burning is also increasingly undertaken on the bushland urban interface. If done too frequently it can significantly reduce the viability of the understorey shrubs and grasses and removes fallen timber and leaf litter, which reduces the habitat quality for woodland birds (Oliver 2004).

1.3.4 Countering weed invasion.

The ACT lowlands contain a relatively high diversity of weed, which is a legacy of both a long agricultural history and disturbance and garden escapees associated with Canberra's development. The focus of weed control is to prevent the introduction of new weeds and to control those weeds such as Chilean Needlegrass, Serrated Tussock, African Lovegrass, St John's Wort and Blackberry that are capable of rapid invasion and spread over Canberra's natural area. Woodland condition and regeneration can also be enhanced by removal of less invasive, but nevertheless troublesome species such as thistles, verbascum, woody weeds and Paterson's curse.

1.4 The current condition and extent of ACT woodlands

As detailed in Table 1, around 45% of the remaining lowland woodland in the ACT is now reserved. About 56% of the remaining moderate to good condition Yellow Box – Blakely's Red Gum woodland is reserved. This represents around 19% of the estimated extent prior to European settlement. Since the woodland mapping undertaken as part of the 2004 strategy, the condition of many areas has changed. In many cases, simply a change in management and land use, such as the removal of stocked grazing, has led to positive changes in woodland condition. Restoration work, such as that achieved in conjunction with ParkCare groups in Canberra Nature Park, has improved the condition of several reserves. Research undertaken by ANU and CSIRO has provided quantifiable evidence about the benefits of reintroducing dead wood (fallen timber) into the system and managing kangaroo grazing pressure. Other woodland areas have been cleared for development, while closure inspection of proposed development areas has located unmapped woodland areas. These changes have generally not been incorporated into woodland mapping.

Table 1: Area of remaining lowland woodland

Vegetation Type/Condition	Area (ha) remaining in the ACT (as mapped in 2004)	Area (ha) reserved (up until mid 2010)
Partially modified lowland woodland	9226	2921
Moderately modified lowland woodland	12591	3717
Moderately modified secondary grassland	2890	616
Substantially and severely modified lowland woodland	12797	3390
Yellow Box – Blakely's Red Gum Grassy Woodland	10870	6160

1.5 Status of the ACT's woodland birds.

The Canberra Ornithologist Group conducted quarterly monitoring of birds in woodland sites, within the peri-urban area of Canberra from 1998 – 2008. The longitudinal trends in occupancy rate were calculated for 55 species (34 woodland-dependent, 21 non-woodland) reported in more than 1% of the 2567 surveys at the ten-year sites:

- 15 species (9 woodland-dependent) showed some evidence of a declining trend over the ten years;

- 25 species (17 woodland-dependent) showed no overall change; and
- 15 species (8 woodland-dependent) showed an increasing trend.

The monitoring found that many species fluctuate greatly between years, and straight-line trends are rare. Comparison of the Canberra data with similar monitoring of birds in the Cowra area, suggested that Canberra's woodland birds had declined less in abundance and species composition than that of Cowra, though these difference could just reflect difference in survey methodology and scope (Bounds J., Taws N. and Cunningham R., 2010). The low abundance of rare and/or threatened birds made them difficult to monitor. However, local extinctions, within specific woodland remnants, of birds such as Hooded Robin, Brown Treecreeper or Little Eagle have occurred in the ACT in recent years.

A study across 30,000km² of central Victoria found commensurate woodland bird declines in the largest woodland remnants (including reserves) as those in cleared landscapes. They attributed population declines to low breeding success due to reduced food, exacerbated by drought conditions. They concluded that resilience of bird populations in northern Victoria might be increased by active management to enhance habitat quality in existing vegetation and restoration of woodland in the more fertile parts of landscapes (McNalley et. al. 2009). This is also likely to be true in the ACT.

1.6 Woodland Conservation and restoration principles

1.6.1 Terminology

Regeneration means the natural recovery of natural integrity following disturbance or degradation (*Australian Natural Heritage Charter – Article 1.23*)

Restoration 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 of species or habitat elements that are known to have existed there naturally at a previous time (*Australian Natural Heritage Charter – Article 1.24*)

Regeneration activities may include changed management practices such as removal of stock grazing, or diverting walking tracks from disturbed areas. Restoration requires active management, such as weed removal or planting and is generally costly and time consuming. The *Australian Natural Heritage Charter* requires that restoration only be used if natural regeneration is not possible, or will not achieve the desired results, and also that any restoration needs to be consistent with the natural significance of the area. Butler (2004) provides a list of factors that should be considered before undertaking vegetation restoration in the ACT, while the Charter suggests that conservation value should be assessed for each site of disturbance.

Rehabilitation is a general term usually inferring restoration to a former condition. It is often used when referring to the rebuilding of habitat, especially breeding habitat. The term can be misleading in that it is impossible to recreate an existing ecosystem once it has been severely impacted (Butler 2004 p9).

1.6.2 Woodland and woodland bird habitat restoration

The basic principles and practice for woodland restoration have been documented in Platt, S.J (2002), McIvor et. al. (2002), Freudenberger and Harvey (2003) Davidson (2005) and Radford et. al. (2006). Key principles include:

- Retain and protect the best vegetation first. The best vegetation has most layers of vegetation present, high plant diversity, relatively few weeds and extensive evidence of faunal activity. These are the areas mapped as partially modified woodland in the lowland woodland strategy. Only low key restoration activities (such as targeted weed control) are appropriate in these areas. Natural regeneration of existing trees should be favoured over planting and re-creating habitat.
- The bigger, the better. Larger patches are resilient to disturbance, tend to contain a greater diversity of habitats, support larger populations of species and are better able to maintain ecosystem functioning. Increasing the size of existing large remnants and reducing edge effects from surrounding land uses should be a key restoration aim.
- Increase connectivity and reduce patch isolation and fragmentation. The more connected a patch is to other patches the greater opportunity for wildlife to survive and reproduce. The more readily that an animal can move across the landscape the more likely that it will find a suitable mate, breeding habitat, food and be able to respond to short-term environmental stresses such as droughts and fire and longer-term environmental impacts such as those that may result from climate change.
- The more types of habitat, the better. Restoration should seek to increase the variation of lowland woodland, including the range of landscapes that it occurs over, and the variety of tree age classes present. Currently in the ACT reserved woodland areas tend to occupy hills and slopes and major river corridors and not lower creeklines and flats.
- Target productive areas and critical habitat elements for protection and restoration. For the same habitat type those more favourable areas, where nutrients and water are bountiful, are most likely to remain productive when others are not. These areas (such as creeklines and alluvial flats) are also more likely to contain large hollow bearing and deep rooted trees which are high value for obligate hollow nesting wildlife, produce a steady and rich nectar flow and through their productively support large numbers of invertebrates. Additional critical elements include understorey vegetation and fallen timber, which can be both protected and re-introduced. Several researchers have found that woodland birds will respond to an increase in tree cover, eucalypt regeneration, ground cover, woody shrubs, leaf litter and/or timber (eg Barrett et. al. 2010, Paton and O'Connor 2010, Oliver and Parker 2006, Stagoll et. al. 2010). Rocky outcrops are hotspots for reptile biota, while restoration plantings should be located around hollow bearing trees (Bond et. al. 2010) The introduction of fallen timber into Mulligans Flat and Goorooyaroo has been shown to dramatically increase beetle diversity (Barton et al 2009); and
- Identify the most significant threats and decide on actions that can best reduce these threats; and

Enhancement of particular threatened or declining birds may be a key goal for woodland restoration in the ACT. This may require a focus on particular vegetation or habitat elements that are key to a particular species. For example, the foraging habitat of the vulnerable Glossy Black Cockatoo could be enhanced through planting of its feed tree

Allocasurina verticillata. The ACT Government has provided funding over the next four years to expand habitat for Glossy Black Cockatoo by expanding habitat through plantings within existing nature reserves.

1.6.3 Plantings

Restoration is not an 'either/or' consideration of planting or assisted natural regeneration. There is a place for both. However, by encouraging natural regeneration from residual species, overall diversity is likely to be greater than can be achieved through introducing plants through direct seeding or planting alone. The latter approach tends to be based on the more commonly and more easily propagated species whereas a natural regeneration approach preserves more closely the uniqueness of Australian ecosystems because plants regenerate and survive in microsites where they are most suited. In addition the successful rate of establishment to maturity is likely to be higher from natural regeneration (Gye 2006). Natural regeneration, which can be triggered simply by grazing exclusion fencing, is also often cheaper than tree plantings (Spooner et. al. 2002).

In extreme cases, inappropriate planting of trees and shrubs may even degrade native communities (for example planting trees over natural grassland, or if the activity creates so much disturbance that subsequent weed growth is counterproductive to improved vegetation quality). To plant, effort is required for seed collection, propagation, transport, machinery, digging, planting and watering. Survival rates are variable, and weeds have to be managed (Gye 2006). Natural regeneration of the endangered Button Wrinklewort on Red Hill with some targeted weed removal has seen the population grow from 1,200 to 7,500 over a twenty year period. In contrast of 1,000 plantings of Button Wrinklewort on Red Hill only 20 plants now survive or have resulted from the seeding of original plantings. Plantings therefore, need to be carefully considered to warrant the expenditure of energy and resources it requires and is most appropriate in degraded areas where natural regeneration cannot readily occur.

1.7 Whole of landscape connectivity

Manning et. al. (2010) urge planners and land managers to recognise the need for wildlife to move across the whole landscape. This implies an ecological network of reserves and biodiversity corridors embedded within a wider matrix, where all parts of the landscape may play a role in conservation and connectivity (irrespective of landuse or tenure).

Key places of connectivity concern

Manning et. al. (2010) employed the Spatial Links Tool (Drielsma et al 2007) to identify for the ACT Government key places of connectivity concern and remedial or planning actions. Separate analysis was conducted for six model animals (a small woodland bird, strongly flying bird, arboreal marsupial, ground dwelling mammal, grassland reptile and amphibian) to reflect the range of animal species that inhabit and move through the ACT.

The authors stress that their results should be regarded as indicative only as they are based on model data and sensitive to the choice of model parameters and ratings for habitat quality and permeability and to grid resolution. Remedial actions should only occur after detailed analysis of habitat, including consideration of which species are relevant (in terms of those actually or potentially naturally occurring in the subject area), where they are distributed, and how they use elements in their environment and move across the landscape.

In relation to restoration/enhancement of connectivity for the small woodland bird the model analysis identified the following as key links requiring strengthening:

- the link between Mulligans Flat and Goorooyarroo with Majura Hills and adjacent NSW land to their north (Greater Goorooyarroo);
- Naas/Tharwa and adjacent land to the east in NSW;
- Murrumbidgee/Molonglo to Hall (which may require connectivity enhancement in nearby NSW); and
- Callum Brae/Jerrabomberra to NSW (via Hume).

Map 1 shows the model data analysis for the small woodland bird.

Other key areas of connectivity concern in the ACT identified in the modelling of all six modelled animals were:

- Black Mountain to Belconnen Hills and lower Molonglo River;
- Hall to Mulligans Flat; and
- East Jerrabomberra nature reserve to Queanbeyan nature reserve (NSW).

An indicative location of the above areas is shown in Map 2, along with additional areas identified in the *ACT Lowland Woodland Conservation Strategy 2004* (p100 – 102) considered as a priority for connectivity improvement actions.

2. Actions for Woodland Restoration in the ACT

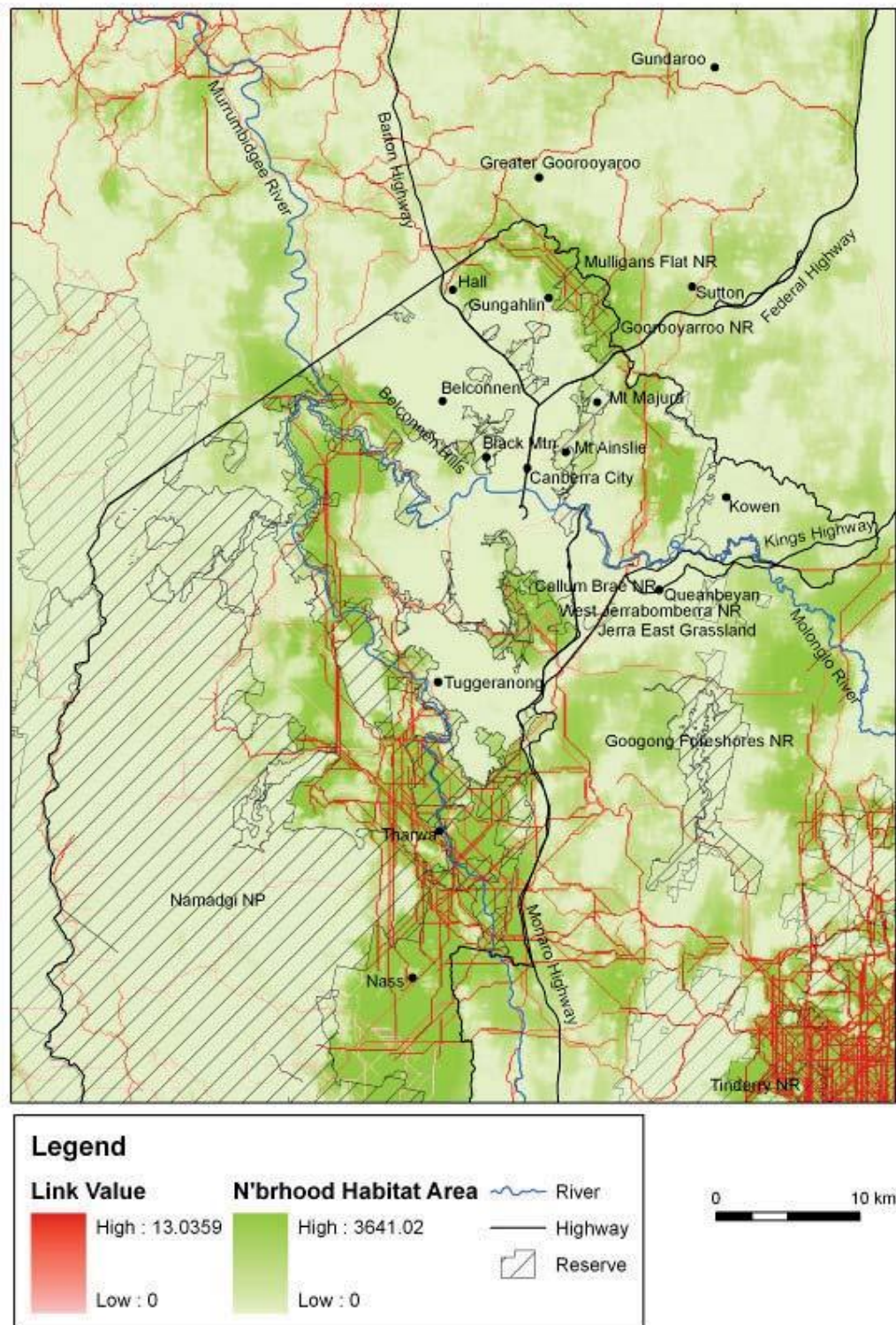
A woodland restoration plan should be developed and implemented in conjunction with an overall woodland plan. This would essentially be an update of the *Woodlands for Wildlife: ACT Lowland Woodland Conservation Strategy, Action Plan 27*, adopted in 2004. The update would build on existing information and should include a stocktake of current condition, a landscape wide regional analysis of woodland function and connectivity and a review of existing and emerging threats (including kangaroo grazing, fire management and urban development).

2.1 Overall principles and priorities

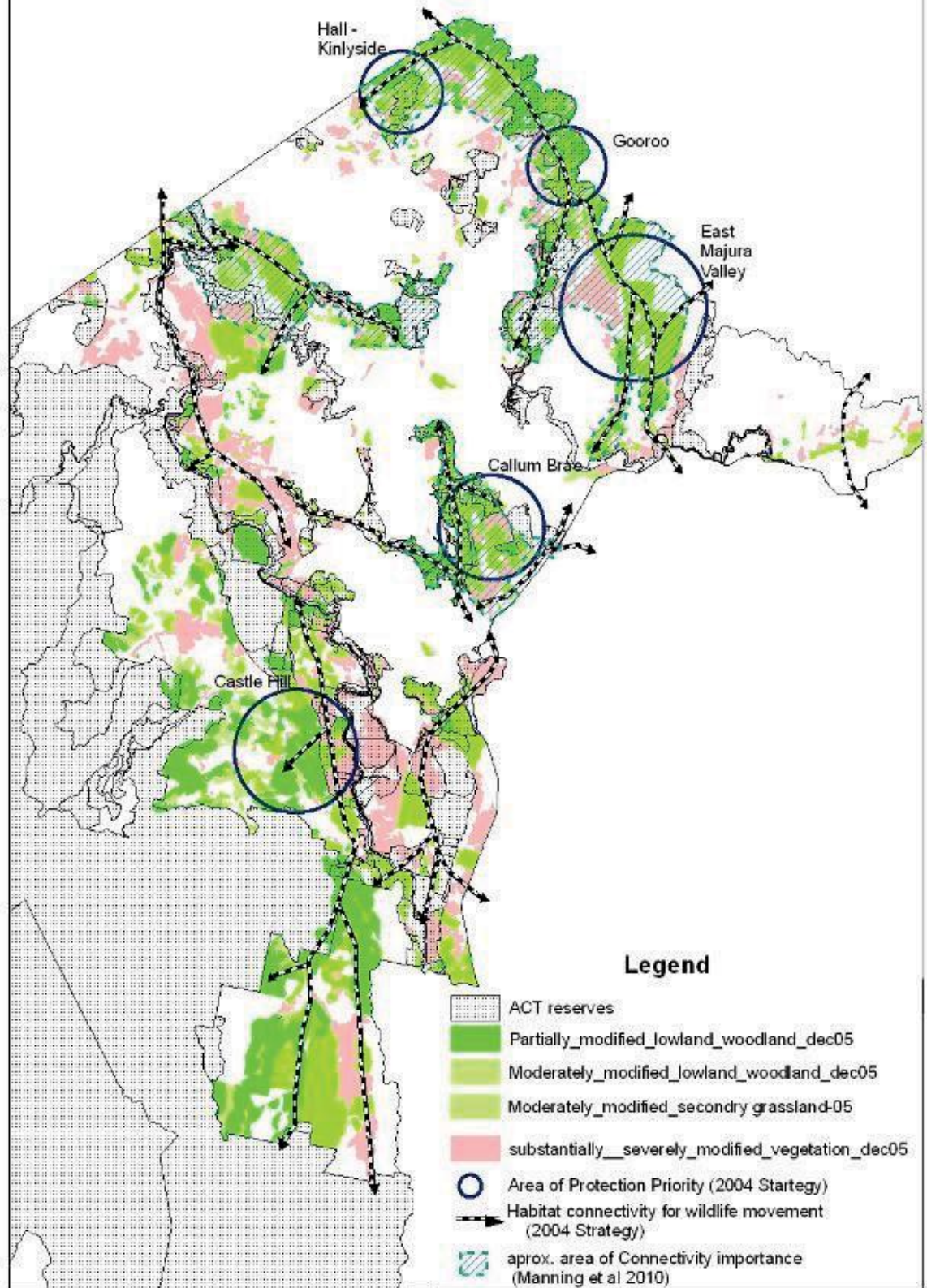
The following principles and priorities have been drawn from the ACT Woodlands Conservation and other relevant documents and scientific literature.

1. Restoration should have a whole of landscape focus.
2. Good quality remnants should be protected and enhanced through natural regeneration and control of threatening processes.
3. More intensive restoration activities should seek to improve the size of existing remnants, improve connectivity and reduce fragmentation, target riparian and productive areas of the landscape, and improve habitat diversity and structural complexity.
4. Retention of large scattered trees and regeneration of this resource should be a focus across all land uses.

Map 1 – link value (red gradient), between key habitat areas and neighbourhood connectivity (green gradient) for model small woodland bird species (from Manning et. al. 2010).



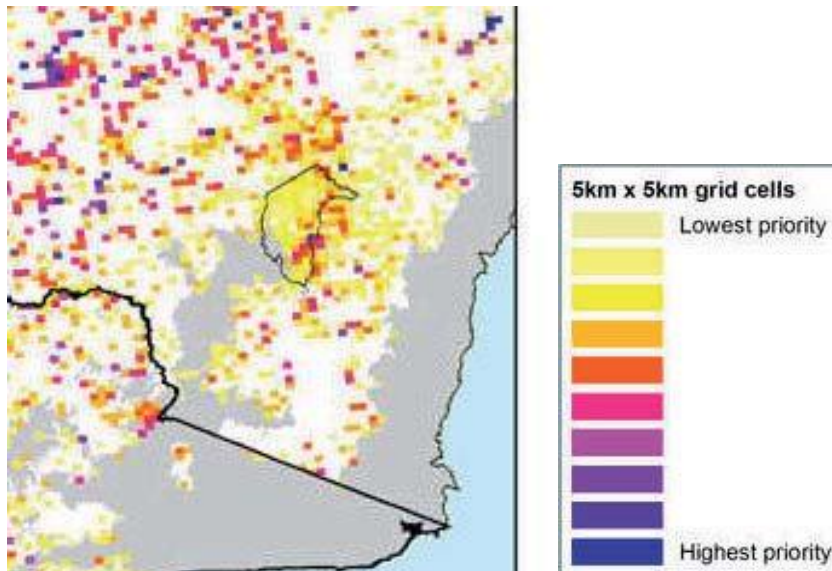
Map 2: Lowland Woodland Condition and Connection



5. Specific measures may be required if restoration is targeting the recovery of particular species.
6. Prior to restoration works commencing the potential impacts of these works on an areas conservation values should be assessed, while there should be consideration of the habitat and movement requirements of wildlife likely to benefit from the works.

Ingwersen et. al. (2010) consider that the best places to focus woodland bird habitat restoration, are those that currently support an abundance and diversity of threatened or declining birds. Based on standardised Bird Atlas records and a priority score depending on the vulnerability of species they identified those 5x5km grid cells across temperate Australia of greatest significance for woodland bird conservation. The ACT lowlands combine to form a relatively large area of moderate priority, with “hot spots” identified in the Naas Valley, The Callum-Brae – Tralee area and Mulligans Flat – Goorooyarroo (see figure 1). It is also likely that the recent survey information for the Lower and Central Molonglo area (Stagoll 2010) would identify at least parts of the valley as a woodland bird hotspot.

Figure 1: Priority sites for woodland bird conservation based on 5km x 5km grid prioritisation in and around the ACT (from Ingwersen et. al. 2010)



Recommendations

1. Action Plan 27 should be updated.
2. The focus for largescale protection and restoration works should be the priority areas identified in map 2 (Hall-Kinlyside, Goorooyarroo, East Majura Valley, Callum Brae and Castle Hill) as well as the Naas Valley, the Murrumbidgee Corridor and the Belconnen Hills to Lower Molonglo.

2.2 On Reserve Restoration

Woodland restoration will need to be co-ordinated across all land-uses in the ACT, but is likely to have different focus and different means of delivering depending on the tenure and condition of land.

Natural regeneration and low disturbance restoration activities should be the focus on conservation reserves that support good or moderate condition lowland woodland (including areas mapped as partially and moderately modified). As consistent with all temperate woodlands (Yates and Hobbs 1997), weed and grazing control are key to improving the quality of ACT's better woodland remnants. In the ACT reserves, grazing control essentially equates to rabbit and kangaroo control. A program of rabbit control and kangaroo culling has begun, but increased funding is required. Weed control has largely focused on those species of greatest threat, namely perennial grasses such as Chilean Needle Grass and African Lovegrass. The condition of woodlands within reserves would also be enhanced through increased control of herbaceous and woody weeds.

Reserves for which assisted natural regeneration of woodland appears to be the most appropriate management focus include Mulligans Flat, Goorooyarroo, Mount Majura, Mount Ainslie, the northern forested portion of Aranda Bushland, Kama, Red Hill, Callum Brae, Mugga Mugga, Isaacs Ridge, Farrer Ridge, Wanniasa Hills and Tuggeranong Hill.

A 2008 woodland research workshop, based around a long term and extensive research program in Mulligans Flat and Goorooyarroo, concluded that there was a "need for active management of woodlands beyond just removing livestock and controlling weeds. This is necessary for two reasons. First, most woodlands have a degree of degradation from past land uses and management that is expressed as loss of species, reduced ecosystem function, and/or loss of habitat elements. Without active and restorative management, these processes and species may not return on their own. Second, there are 'natural' processes to which the biota are adapted which are unlikely to be restored and which may need to be substituted for by human intervention. The two prominent examples are the lack of apparent controls for tree density and a lack of predators for kangaroos..."

Small scale plantings of up to a few hectares or non-intrusive introduction of habitat elements such as fallen timber could be appropriate in those reserves largely supporting good or moderate woodland. These actions could be targeted towards, replacing missing elements, enhancing habitat of a particular species of conservation focus, or as an offset for the loss of shrub layer within a fire asset protection zone, or as part of "anticipatory restoration" prior to the removal of woody weeds. If we assume that replanting requires 500 tree, shrubs or understorey plants per hectare, then the cost per hectare would be around \$1750. The impact on other conservation values and the fire risk consequences of plantings would need to be assessed prior to works commencing. Areas of greatest disturbance away from the urban edge are likely to be the most appropriate sites for smaller scale plantings.

Map 3 indicates the extent of woodland and the condition, within the reserve network, as mapped by the 2004 Lowland woodland Strategy. It also shows areas within the reserve network that were mapped, through satellite interpretation, as largely consisting of exotic species (Fallding 2002), which provides an initial indication of sites within the Reserve network that may be suitable for small scale targeted plantings or introduction of missing habitat elements. Maps at Appendix 2a – 2c provide this information in more detail.

Parts of the ACT reserve network contain land that was previously cleared rural lease and are currently of poor quality. Large scale restoration activities, using techniques such as direct seeding may be appropriate in these areas. Reserves that contain large areas of degraded vegetation and which are within priority locations for restoration include Mt Painter, The Pinnacle, parts of Wanniasa Hills, Coolaman Ridge and parts of the

Murrumbidgee Corridor including land within the Stony Creek, Pine Island/Point Hut, Bullen Range and Lanyon Landscape Conservation Area.

Appendix 1 lists those reserves that contain more than 10 ha of lowland woodland or land that formerly supported lowland woodland, and the main restoration activities that are appropriate to each reserve.

Recommendations

3. Natural regeneration and weed and grazing control should be the major restoration focus of reserves that already largely consist of good to moderate condition woodland.
4. Small scale plantings of up to a few hectares and introduction of missing habitat elements such as fallen timber are appropriate in reserves that have a good or moderate condition, provided the works are targeted to provide or enhance particular habitat requirements.
5. Larger scale plantings/seeding are appropriate in more heavily degraded but productive reserve areas (usually low in the landscape). The plantings should enhance the size and connectivity of remnants in priority areas and where possible incorporate paddock trees.
6. Strategic use of ParkCare and other volunteer groups should occur in the implementation of restoration actions.
7. Weed and grazing control measures should be co-ordinated with adjoining rural lessees and other neighbouring land owners or managers.

2.3 Rural Lease Woodland Restoration

The woodland restoration plan will need to consider how to better engage rural landholders in restoration activities. This could involve facilitation of voluntary actions or partnerships in relation to fencing of remnant vegetation, managing regrowth, or conservation grazing that could be detailed through the Land Management Agreement process. Woodland restoration could also include provision of incentive or offset payments to priority regeneration areas. Such payments would need to be associated with a legal agreement, such as a conservation covenant, where in exchange for payment a landholder enters a binding commitment to undertake specified conservation management activities. The Department of Environment Climate Change Energy and Water is currently developing an ACT biodiversity offsets policy as well as reviewing the *Nature Conservation Act 1980*, both of these processes could help facilitate woodland restoration in the ACT, and rural areas in particular. The existence of long term offset or covenant agreements would also improve the eligibility of ACT rural leaseholders to receive Commonwealth environmental funding under such programs as Caring for Country.

On rural leases priority should be given to restoration activities that:

- increase the size and or condition of existing large remnants;
- increase the connectivity of remnants across the ACT;
- focus on areas of high productivity such as creeklines and flats;
- incorporate paddock trees within any replantings;
- are remote from the urban edge, so that plantings are not compromised by fuel reduction activities and other human disturbance and to minimise the extent of urban cat predation; and
- adjoin and complement high quality woodland and known hotspots of threatened and declining woodland birds.

Areas that appear to meet the above criteria include Central Molonglo, the Throsby Neck, the northern edge of the ACT between Mulligans Flat Nature Reserve and Hall; the Naas Valley and Castle Hill (see map 2).

Prior to restoration works commencing, an assessment of the conservation values of the work site should be conducted to ensure that the activity is not degrading existing natural or cultural values. Actions that address or will address the threatening processes of grazing, fire, feral animal predation, firewood collecting, dieback and weed invasion should also be in place prior to works.

For the North East section of the ACT, an analysis of the density of native trees has been produced, through interpretation of aerial photography. Areas of widely and moderately spaced trees are perhaps a good focus for restoration activity on rural land (see Map 3).

Recommendations

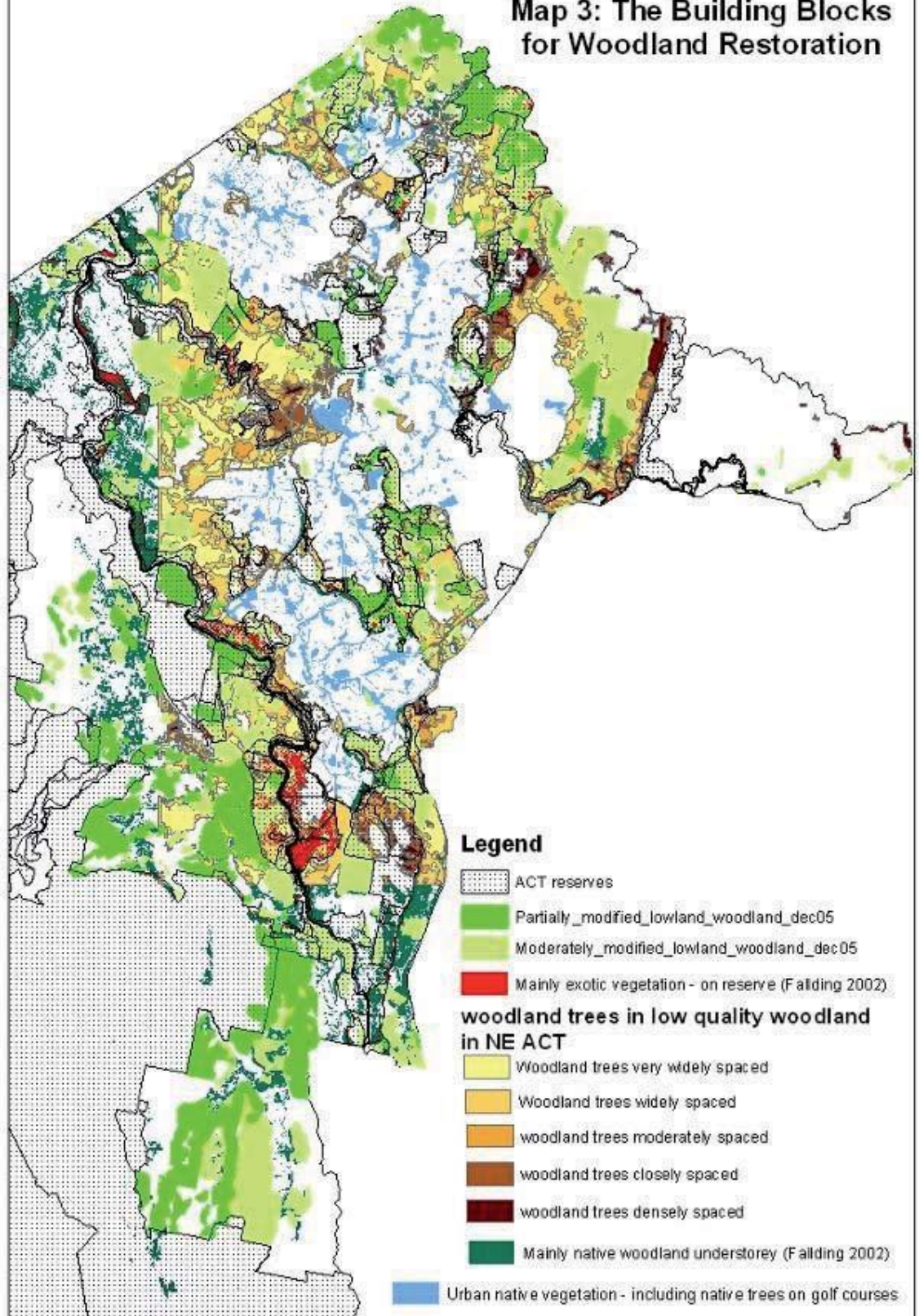
8. Restoration actions are encouraged on rural land through the Land Management Agreement process.
9. Offsets, covenanting and/or other options for incentive payments be utilised.
10. Incentive payments should be directed towards priority restoration areas.

2.4 Restoration in Urban Areas

Manning et. al. (2010) consider that off reserve connectivity restoration may involve establishing trees, shrubs, water bodies, grassland and/or dead wood. Within suburbs this might involve ‘mini habitat patches’ focused on individual trees, pocket parks or mixed use areas. Conservation of mature scattered trees is identified as important on both urban and rural land. Stagoll et. al. (2010) also recommend the preservation of scattered trees throughout the landscape, noting that even a single eucalypt tree can dramatically improve available habitat for woodland birds. Within urban areas they consider that intensive management around these trees, such as grass mowing and removal of coarse debris, should be minimised. The authors also recommend that woodland bird conservation outcomes can be integrated into urban design by encouraging the replacement of trees through regeneration and by keeping a structurally complex habitat [this seems a bit unrealistic for an urban area]. Regeneration in urban areas may need to involve planting, while in peri-urban rural landscapes, tree regeneration can be improved through a reduction in grazing pressure by applying low-input, fast-rotational grazing practices and the cessation of fertiliser use.

A bird forum held to inform the ACT Commissioner for Sustainability and the Environment (Beacon Hill 2010) urged that the planning process should have a greater focus on landscape connectivity including adequate corridor structures, road verges with appropriate understorey, appropriate fire management aspects, and should take into account existing natural assets such as creeks, wetlands, woodland and grassland. The need to consider and apply the most appropriate methods to access and engage the different communities was also highlighted. Community care programs, ongoing

**Map 3: The Building Blocks
for Woodland Restoration**



community education through provision of information and positive media stories, and education and engagement of families in urban care programs for their children at schools were key points raised during the forum.

Map 3 indicates areas within the urban footprint which mainly support native vegetation (either trees or understorey or both and given a blue colouring in map 3), which could be further enhanced as woodland habitat.

Recommendations

11. Retention of large trees should be maximised within new urban developments, to create “woodland islets” and “stepping stones” through the urban landscape.
12. Regeneration and planting activities should be focused around these large trees and riparian areas and include a complexity of habitat, though care will need to be taken that the plantings do not compromise fire planning.

2.5 Monitoring, Evaluation and Research

The Mulligans Flat-Goorooyarroo Woodland Experiment is evaluating the conservation effects of potential woodland management actions, namely the control of cats and foxes, the retention of dead wood on the ground, and control of the level of kangaroo grazing. Levels of these management treatments are being assessed by the response of woodland plants and animals. In addition, locally extinct species are to be reintroduced to the fenced (cat and fox-proof) Mulligans Flat Woodland Sanctuary (Manning 2008).

The Pinnacle ParkCare group has Commonwealth funding to investigate restoration techniques, such as sugar application to reduce exotic grass abundance.

The ACT Government is monitoring grazing pressure within grassland and woodland nature reserves. Grazing pressure can be measured as the difference in amount of ground layer vegetation inside and outside grazing enclosure cages. Cages can be designed to separately estimate removal by rabbits and kangaroos. Accurate estimates of kangaroo numbers (either counts of animals or pellets) are important to tie kangaroo densities to a level at which significant damage to restoration ability occurs. To obtain clear results, the monitored reserves must differ sufficiently in kangaroo grazing pressure, and there must be sufficient replication, at least sixteen sites are needed. However the current level of effort (four reserves fully monitored) is not certain to produce unequivocal results.

Recommendations

13. Research into the most effective measures for woodland and bird habitat restoration and management should be encouraged and supported.
14. Restoration actions should be responsive to new research findings and on the ground monitoring.
15. Success criteria should be transparent and measurable and based on relevant ecological and biophysical indicators. They must reflect the restoration goals, be responsive to restoration actions and lack ambiguity, and ideally, be relatively easy and economic to sample (Radford et. al. 2006).

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Appendix 1 – On Reserve Woodland Restoration Actions

Reserve Name	Area of good condition woodland (ha)	Area of low condition woodland (ha)	Key conservation values of lowland woodland area within reserve	Within Priority Restoration Area? Areas in bold are of highest connectivity – remnant size value	Major Restoration Activity
Aranda Bushland Nature Reserve	90.29	12.04	High plant diversity including many rare and threatened plants; Relic Snow gum woodland	Yes - part of Belconnen Hills to Lower Molonglo	Assisted natural regeneration. Primary rabbit control. Priority for density estimate of EGK* and amount of ground layer vegetation. Small scale planting of snowgum woodland paddock is probably appropriate. Weed control focused on St John's Wort and Paterson's Curse.
Birrigai	88.12	0		No	Assisted natural regeneration. Priority for density estimate of EGK. Weed control focused on Serrated Tussock and African Lovegrass.
Black Mountain Nature Reserve	26.29	0	Values largely relate to dry forest	Yes - part of Belconnen Hills to Lower Molonglo	Priority for density estimate of EGK and amount of ground layer vegetation. Assisted natural regeneration and primary rabbit control. Weed control focused on St John's Wort
Bruce Ridge Nature Reserve	79.02	23.41		Yes - part of Belconnen Hills to Lower Molonglo	Assisted natural regeneration. Weed control focused on Chilean Needlegrass and Blackberry
Bullen Range Nature Reserve	808.96	215.95	Relatively large and well connected area of Box – Gum grassy woodland, particularly on west side of river. Populations of several rare and threatened plants Historic and Aboriginal cultural sites	Important component of Murrumbidgee corridor	Assisted natural regeneration. Large scale planting may be appropriate in that part of the Reserve closest to Chapman and adjoining and in the vicinity of Urambi Hills reserve. Weed control focused on Blackberry.
Bullen Range Special Purpose Reserve	74.51	34.64	Part of large and well connected area of Box Gum woodland Aprasia habitat	Important component of Murrumbidgee corridor	Assisted natural regeneration. Large scale planting may be appropriate in that part of the Reserve closest to Chapman and adjoining and in vicinity of Urambi Hills reserve. Weed control focused on Blackberry
Callum Brae Nature Reserve	127.75	3.4	Relatively large and well connected area of Box – Gum grassy woodland. Important woodland bird habitat.	Yes – part of Callum Brae complex	Assisted natural regeneration. Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focused on St John's Wort, Paterson's Curse, Thistles, Serrated Tussock and Blackberry
Cooleman Ridge Nature Reserve	79.02	99.91	Aprasia habitat; Rare plants present in understorey	important link in east –west woodland connection	Assisted natural regeneration in better condition areas. Either Targeted or largescale planting may be appropriate in lower more degraded areas. Weed control focused on Verbascum, Blackberry and Serrated Tussock.
Cotter Reserve	6.28	25.51		component of Murrumbidgee corridor	High use area, may be suitable for largescale or targeted planting. Weed control focused on Blackberry.

Reserve Name	Area of good condition woodland (ha)	Area of low condition woodland (ha)	Key conservation values of lowland woodland area within reserve	Within Priority Restoration Area? Areas in bold are of highest connectivity – remnant size value	Major Restoration Activity
Dunlop Grasslands Nature Reserve	10.72	5.57	Woodland only minor component of reserve.	No	Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focused on Serrated Tussock.
Farrer Ridge Nature Reserve	143.36	41.15	High plant diversity including many rare and threatened plants; Habitat of Aprasia	Yes - adjoins Callum Brae Complex and important link in east –west woodland connection	Assisted natural regeneration. Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focused on Serrated Tussock, St John's Wort, African Lovegrass and Paterson's Curse.
Gigerline Nature Reserve	314.67	258.18	Contains relict <i>E. viminalis</i> Tableland Riparian Woodland Aprasia and Hooded Robin habitat. Important riverine landforms Historic and Aboriginal cultural sites	Identified as of importance to connectivity	Assisted natural regeneration. Weed control focused on Blackberry.
Goorooyarroo Nature Reserve	662.94	16.84	Relatively large and well connected area of Box – Gum grassy woodland. Important habitat of woodland birds. Golden Sun Moth recorded in woodland.	Yes – key part of Goorooyarroo to Majura Hills	Assisted natural regeneration, ongoing restoration in line with research projects. Priority for density estimate of EGK and amount of ground layer vegetation.. Weed control focus on Serrated Tussock and Paterson's Curse.
Gungaharra Grasslands Nature Reserve	22.06	23.7	High woodland plant diversity including several rare species, small area of uncommon Snow gum woodland.	No	Assisted natural regeneration. Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focus on Serrated Tussock, Paterson's Curse and woody weeds.
Harcourt Hill	42.39	0		No	Assisted natural regeneration. Priority for density estimate of EGK Weed control focus on Paterson's Curse and woody weeds.
Isaacs Ridge Nature Reserve	324.52	18.46	Relatively large area of lowland woodland	Yes - Part of Callum Brae Complex	Assisted natural regeneration. Priority for density estimate of EGK and amount of ground layer vegetation. Primary rabbit control. Possible site of targeted small scale plantings to enhance woodland bird habitat. Weed control focus on African Lovegrass, Woody Weeds, St John's Wort and Serrated Tussock.
Kama Nature Reserve	116.26	0	Good condition critically endangered woodland supporting populations of rare and threatened woodland birds including Brown Treecreeper	Yes - part of Belconnen Hills to Lower Molonglo	Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation. Small scale targeted planting in northern part of the reserve to enhance woodland bird habitat. Weed control focus on Paterson's Curse and St John's Wort.
Kambah Pool Recreation Area	6.23	29.55		component of Murrumbidgee corridor	Assisted natural regeneration. Weed control focused on African Lovegrass (trial areas only) and Blackberry.

Reserve Name	Area of good condition woodland (ha)	Area of low condition woodland (ha)	Key conservation values of lowland woodland area within reserve	Within Priority Restoration Area? Areas in bold are of highest connectivity – remnant size value	Major Restoration Activity
Kowen Escarpment Nature Reserve	0	53.76		On edge of Majura Hills area	Assisted natural regeneration. Weed control focus on Serrated Tussock.
Lanyon Landscape Conservation	300.93	1101.7	Contains relict <i>E. viminalis</i> Tableland Riparian Woodland, Populations of rare plants Large area of critically endangered Box – Gum grassy woodland on western side of river Historic landscape with many historic and Aboriginal sites	Yes – important component of Murrumbidgee Corridor and Castle Hill Complex	Assisted natural regeneration. Area close to river on the eastern bank and larger parts of the western bank component could be enhanced through planting, but impact on cultural landscape would need to be considered. Weed control focused on African Lovegrass (trial areas only)
Lower Molonglo Nature Reserve	10.83	12.81	Values largely relate to riparian and dry forest vegetation. Woodland areas likely to support Aprasia	Yes - part of Belconnen Hills to Lower Molonglo	Largely riparian and dry forest. Assisted natural regeneration. Weed control focus on Crack Willow, Blackberry and Woody Weeds.
McQuoids Hill Nature Reserve	19.54	17.9	Values largely relate to riparian vegetation and dry forest, but contains some relictual <i>E. pauciflora</i> woodland.	On edge of east – wets and Murrumbidgee corridor	Assisted natural regeneration
Molonglo Gorge Nature Reserve	16.39	63.34		On edge of Majura Hills	Assisted natural regeneration
Molonglo River Corridor Stromlo	20.1	18.9			
Mount Ainslie Nature Reserve	196.21	75.23	High plant diversity including many rare and threatened plants; Relatively large area of lowland woodland Breeding habitat of Glossy Black Cockatoo and important habitat of other threatened and declining woodland birds	Yes – key part of Gorooyaroo to Majura Hills	Assisted natural regeneration. Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation. Small scale target plantings in lower degraded areas away from housing, may be appropriate. Weed control focus on Chilean Needlegrass, Serrated Tussock, St John's Wort and Woody Weeds.
Mount Majura Nature Reserve	221.68	34	High plant diversity including many rare and threatened plants; Relatively large area of lowland woodland Fossil outcrop Old fence-line and Aboriginal sites Breeding habitat of Glossy Black Cockatoo	Yes – key part of Gorooyaroo to Majura Hills	Assisted natural regeneration. Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation. Small scale target plantings in lower degraded areas away from housing, may be appropriate. Weed control focus on Chilean Needlegrass, Horehound, Capeweed, Serrated Tussock and Woody Weeds.

Reserve Name	Area of good condition woodland (ha)	Area of low condition woodland (ha)	Key conservation values of lowland woodland area within reserve	Within Priority Restoration Area? Areas in bold are of highest connectivity – remnant size value	Major Restoration Activity
Mount Mugga Mugga Nature Reserve	149.49	12.66	Aprasia and Perunga habitat. Part of a relatively large and well connected lowland woodland patch, with a fairly diverse understorey.	Yes - Part of Callum Brae Complex	Assisted natural regeneration. Primary rabbit control. Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focus on St John's Wort, Paterson's Curse, Serrated Tussock and African Lovegrass.
Mount Painter Nature Reserve	70.54	10.51	Central woodland reserve	Yes - part of Belconnen Hills to Lower Molonglo	Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation. Small to medium scale plantings may be appropriate, particularly on lower slopes. Weed control focus on St John's Wort, Thistles and Paterson's Curse. Primary rabbit control. May be suitable for target plantings. Weed control focus on Chilean Needlegrass, Serrated Tussock, African Lovegrass, Blackberry, Woody Weeds
Mount Pleasant Nature Reserve	6.85	28.42	Historic 1917-23 plantings	Connects Jerrabomberra wetlands and Molonglo River to Mt Ainslie Reserve	Assisted natural regeneration. Primary rabbit control.
Mount Taylor Nature Reserve	22.05	0	High plant diversity including many rare and threatened plants, including small purple pea; Aprasia habitat	important link in east –west woodland connection	Priority for density estimate of EGK and amount of ground layer vegetation. Control spreading form of tall African Lovegrass, other weed control focused on Serrated Tussock, Verbascum and Woody Weeds.
Mulligans Flat Nature Reserve	739.82	32.48	High plant diversity including many rare and threatened plants; Relatively large and well connected area of Box – Gum grassy woodland Historic and Aboriginal cultural sites Important woodland bird habitat. Golden Sun Moth and Keys Matchstick Grasshopper also recorded from area.	Yes – key part of Goorooyarroo to Majura Hills	Assisted natural regeneration, ongoing restoration in line with research projects. Priority for density estimate of EGK and amount of ground layer vegetation .. Weed control focused on Serrated Tussock and Paterson's Curse
Namadgi National Park	357.49	16.71	Relatively large and well connected area of lowland woodland	No	Assisted natural regeneration. Priority for density estimate of EGK. Weed control focused on Serrated Sweet Briar, Blackberry, Nodding Thistle, Verbascum, Broom, Serrated Tussock and African Lovegrass.
Namadgi National Park Special Purpose	157.61	24.86	Relatively large and well connected area of Box – Gum grassy woodland	Important part of Murrumbidgee to Naas Valley link	Assisted natural regeneration. . Weed control focused on Sweet Briar, Blackberry, Nodding Thistle, Verbascum, Broom, Serrated Tussock and African Lovegrass.

Reserve Name	Area of good condition woodland (ha)	Area of low condition woodland (ha)	Key conservation values of lowland woodland area within reserve	Within Priority Restoration Area? Areas in bold are of highest connectivity – remnant size value	Major Restoration Activity
Oakey Hill Nature Reserve	2.26	24.94		No	Assisted natural regeneration. Weed control focused on African Lovegrass, Chilean Needlegrass and Blackberry
Percival Hill Nature Reserve	27.44	0.52		No	Assisted natural regeneration. Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focus on Serrated Tussock.
Pine Island / Point Hut	36.53	102.65	Contains high diversity of vegetation type, including <i>E. pauciflora</i> – <i>E. rubida</i> tableland woodland, and several threatened or rare plant species Red Rocks Gorge geological area Habitat of Aprasia Historic and Aboriginal cultural sites	Important part of Murrumbidgee River Corridor	Largescale or targeted plantings may be appropriate in this reserve. Weed control focused on African Lovegrass (trial sites only), Blackberry and Crack Willow.
Red Hill Nature Reserve	230.5	25.35	High plant diversity including many rare and threatened plants; Relatively large and well connected area of Box – Gum grassy woodland Habitat of Perunga and Aprasia Historic 1917 plantings Significant geological exposures	Yes - Part of Callum Brae Complex	Assisted natural regeneration. Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation .Small scale planting to enhance woodland bird habitat on site of old tip and/or ridge above Garraan. Weed control focus on Chilean Needlegrass, Verbascum, Blackberry, Woody Weeds, Serrated Tussock, Paterson's Curse and African Lovegrass.
Rob Roy Range Nature Reserve	459.66	405.51	Relatively large and well connected area of lowland woodland Important habitat of several threatened or declining woodland birds such as the Hooded Robin	Part of link into NSW and Angle Crossing to Tuggeranong	Assisted natural regeneration. Weed control focused on Serrated Tussock.
Sherwood Forest	24.68	73.96			Weed control focused on Blackberry.
Stony Creek Nature Reserve	38.18	141.8	Values largely relate to riparian vegetation Aprasia habitat	Important part of Murrumbidgee River Corridor	Largescale or targeted plantings may be appropriate in this reserve. Weed control focused on Blackberry
Stony Creek Special Purpose Reserve	1.78	34.14		Important part of Murrumbidgee River Corridor	Largescale or targeted plantings may be appropriate in this reserve. Weed control focused on Blackberry.
Swamp Creek	84.44	10.64	Values largely relate to riparian vegetation Historic and Aboriginal sites present	Part of Murrumbidgee River Corridor	Assisted natural regeneration. Weed control focused on Blackberry.

Reserve Name	Area of good condition woodland (ha)	Area of low condition woodland (ha)	Key conservation values of lowland woodland area within reserve	Within Priority Restoration Area? Areas in bold are of highest connectivity – remnant size value	Major Restoration Activity
The Pinnacle Nature Reserve	32.25	84.64	Central woodland reserve	Yes - part of Belconnen Hills to Lower Molonglo	Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation. Further largescale plantings and introduction of habitat elements would be appropriate in this reserve. Weed control focused on St John's Wort, Paterson's Curse, Thistles, Verbascum, African Lovegrass
Tuggeranong Hill Nature Reserve	285.96	48.5	Relatively large and well connected area of Box – Gum grassy woodland Aboriginal sites – Axe grinding grooves Aprasia habitat	Part of link to NSW and Tuggeranong to Angle Crossing	Assisted natural regeneration. Priority for density estimate of EGK and amount of ground layer vegetation. Control spreading form of tall African Lovegrass, other weed control focused on Serrated Tussock, Paterson's Curse and St John's Wort
Urambi Hills Nature Reserve	190.18	8.47	Relatively large and well connected area of lowland woodland. Aprasia habitat	Part of Murrumbidgee corridor	Assisted natural regeneration. Priority for density estimate of EGK. Weed control focused on African Lovegrass and Paterson's Curse.
Wanniassa Hill Nature Reserve	229.93	17.97	Relatively large and well connected area of lowland woodland Aboriginal sites	Yes - Part of Callum Brae Complex	Assisted natural regeneration. Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focused on African Lovegrass and Paterson's Curse.
Wanniassa Hill Special Purpose Reserve	25.71	46.55		Yes - Part of Callum Brae Complex	Targeted or largescale plantings may be appropriate in this area. Weed control focused on African Lovegrass and Paterson's Curse.
Watson Woodlands	0	14.03	Box Gum woodland in highly productive part of landscape, and intergrade of woodland with grassland.	On edge of Gorooyarroo to Majura Hills Area	Targeted small scale plantings appropriate in this area. Weed control focused on Chilean Needlegrass.
West Jerrabomberra Nature Reserve	77.22	4.14	Relatively large and well connected area of lowland woodland.	Yes - Part of Callum Brae Complex	Assisted natural regeneration. Follow up of primary rabbit control undertaken. Priority for density estimate of EGK and amount of ground layer vegetation. Weed control focused on Serrated Tussock, Thistles, Woody Weeds, and St John's Wort.
Woodstock Nature Reserve	107.39	0.16	Values largely relate to riparian habitat Aprasia habitat	Yes - part of Belconnen Hills to Lower Molonglo and Murrumbidgee Corridor	Assisted natural regeneration. Planting of non woodland vegetation would assist connectivity, but not a target area for woodland restoration plantings. Weed control focused on Serrated Tussock and Blackberry.
Woodstock Special Purpose Reserve	50.72	0	Aprasia habitat	Yes - part of Belconnen Hills to Lower Molonglo - Murrumbidgee Corridor	Assisted natural regeneration. Weed control focused on Serrated Tussock and Blackberry.

