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**Inquiry into urban vegetation and wildlife corridors and the integration of biodiversity conservation in land use planning in the ACT and its sub-regions.
Draft Variation to the Territory Plan No. 231 - as a case study**

Thank you for the opportunity to comment on the above inquiry. The ACT Red Hill Bush Regenerators Inc. is a voluntary community Parkcare group, that for the past 16 years has been an active manager of about 450ha of urban remnant woodland. The group is both a Landcare and National Bank environmental group of the year (ACT) winner. It is our hands-on experience and long-term perspective that we wish to convey to the Assembly Committee. In particular we are calling for (i) changes to the planning system in order to provide suitable levels of impact assessment for all activities that clear or disturb native vegetation; and (ii) that the principle of "net vegetation gain" be embedded within that assessment process.

This submission stresses that Canberra's urban vegetation has been so adversely impacted upon by urban encroachment that its future survival is in peril. Retention of Canberra's biodiversity relies on an increase in the quantity (or area), quality (or condition) and connectivity of remaining vegetation. Whilst the condition of Canberra's bushland remnants has improved dramatically over the last 16 years (much of this due to the volunteer Parkcare program), the extent and connectivity of native vegetation has been continually chipped away. Unlike most States, the ACT has not adopted the principle of "net gain" or "no net loss" in native vegetation management. Such an approach is urgently needed if the Canberra Plain is to retain its biodiversity.

The experience on Red Hill illustrates that the designation of "Nature Reserve" does not prevent significant vegetation loss. Rather it seems to highlight an area as a land bank for infrastructure and services development. Over the last 16 years Red Hill Nature Reserve has been subject to thirteen infrastructure developments, which together with park management and service maintenance activities has resulted in the loss of hundreds of trees and degradation of a large area of vegetation. All this development activity has occurred with only cursory consideration of the natural or cultural environment and, to our knowledge, no impact assessment documentation. It is particularly disappointing that needless destruction of significant environmental features has resulted on Red Hill from thoughtless development and management activities (see Appendix 1 for details).

The Red Hill Regenerators hope that this Inquiry will result in all activities that

clear or significantly degrade native vegetation being subject to at least an initial or preliminary impact assessment.

Our group was particularly dismayed by the process through which the East O'Malley development was assessed and approved. This large area of endangered woodland, also known to be a regular breeding habitat of four threatened bird species (White-winged Triller and Varied Sittella, listed in ACT; Diamond Firetail and Speckled Warbler, listed NSW), was approved for bulldozing with only a preliminary impact assessment. The flora and fauna study merely consisted of one person spending two half days walking over the site at a time of year when many significant species would not be apparent.

We hope that through this Inquiry, and the planning review that is underway, the community may be able to gain some confidence that, in the future, the fundamental questions of impact assessment will be addressed, namely;

1. what are the features of significance that could be impacted?, and
2. how can these impacts be avoided or minimised?

The current approval process certainly does not inspire confidence.

In summary, the Red Hill Regenerators considers that biodiversity conservation should be integrated in land use planning through;

1. ensuring adequate and appropriate impact assessment for all activities that clear or degrade native vegetation;
2. avoiding impacts as the first priority (with the nature reserve system only being used by infrastructure developments in exceptional and well justified circumstances);
3. where no other prudent and feasible alternatives exist, making sure that impacts are minimised; and
4. if impacts occur make sure that they are offset by gains elsewhere so that there is no net loss in Canberra's bushland extent, quality or connectivity.

The Red Hill Regenerators would relish the opportunity to show the Assembly Committee members around Red Hill to demonstrate the points made in this submission, and would like to be part of the public hearings. Please do not hesitate to contact me if you wish to discuss any of the matters raised.

Yours sincerely

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**SUBMISSION BY THE ACT RED HILL BUSH REGENERATORS INC. TO
THE INQUIRY INTO URBAN VEGETATION AND WILDLIFE CORRIDORS
AND THE INTEGRATION OF BIODIVERSITY CONSERVATION IN LAND
USE PLANNING IN THE ACT AND ITS SUB-REGIONS.**

TABLE OF CONTENTS

Cover letter	1-2
Table of contents	3
1. Introduction	4
2. Biodiversity loss at the landscape scale	4
3. Current native vegetation management in the ACT	6
3.1 What the "fence around the best bits" planning approach has meant to Red Hill.	8
3.2 The result of the "fence around the best bits" planning approach in Draft Variation to the Territory Plan No 231.	9
4. What future landscape planning should involve	11
4.1 The principle of Net Gain	11
4.2 " Net Gain" Embedded within the <i>Land (Planning and Environment Act) Bill 1991</i> .	12
4.3 Clearance activities and offsets overseen by independent body	13
5. Management of Canberra's remnant vegetation including that within formal conservation reserves.	13
5.1 Nature Reserve or infrastructure landbank?	14
5.2 The need for on-reserve management plans and environmental review of on reserve clearance /disturbance activities.	14
6. Environmental Impact Assessment in the ACT desperately in need of reform	16
6.1 The need for all activities that could impact urban biodiversity + conservation values to be assessed	16
6.2 Failings of the old impact assessment process	17
6.3 Lack of adequate description and assessment of conservation significance for biodiversity found within a development area	17
6.4 Conflict of interest	19
7. References	20
Appendix 1. Development Activities on Red Hill since 1988	21-26
Figure 1. Mitchell landscapes of the ACT	27

1. INTRODUCTION

The ACT Red Hill Bush Regenerators Inc. is an active Parkcare group of about 30 members. Over the last 16 years we have worked tens of thousands of hours, transforming Red Hill from a heavily weed infested and degraded urban remnant to what has now one of the most significant box-gum remnants anywhere in Australia.

This improvement has eventuated from a working partnership between our group and Canberra Nature Park staff. Our joint success is mirrored by other Parkcare groups. Past and present governments are to be congratulated for the long-term and consistent support of the Parkcare program. Parkcare has brought enormous benefit to ACT's urban nature reserves, along with a sense of community ownership, and should be supported in the future.

This submission draws heavily on what we have observed and endured, as a Parkcare group, in relation to land-use planning connected to Red Hill. The submission also tries to draw parallels between what has happened on Red Hill, and the planning in Kenny and Throsby.

Prior to discussing on-site examples of past planning decisions and development activities it is first necessary to put ACT's urban vegetation and wildlife corridors in a regional and landscape perspective.

2. BIODIVERSITY LOSS AT THE LANDSCAPE SCALE

Red Hill contains one of the largest remaining remnants of its woodland type (about 450ha), anywhere. It supports one of the highest diversities of woodland plants recorded in South-eastern Australia. It also is significant habitat for 8 threatened and 18 regionally uncommon plant, bird and lizard species. Despite these features our group has observed apparent local extinctions on the Hill, including one plant and three birds (following the bulldozing of East O'Malley), and long term monitoring has indicated significant declines in the populations of many woodland bird species. These losses and declines have happened despite a dramatic improvement in habitat quality on the Hill. For example, in 1997 around 54% of Red Hill was dominated by weeds, today that figure is at 14%.

The continuing losses are probably due to the degree of clearing and fragmentation that has occurred in the Canberra area. In a study spanning a variety of landscape types, Rosenzweig (1995) found that there was a consistent decline in the number of species present with increasing land clearance. When clearance exceeded 70% landscapes were particularly species depauperate. The threshold below which movements of several taxa are impacted is believed to occur at a clearance level of between 30 and 70% (e.g. McIntyre 2000).

The size of remnant patches of native vegetation within a landscape is also crucial to retaining biodiversity. For example, Seddon et al (2001) surveyed 36 woodland remnants that ranged in area from 1 to 1,376 hectares, and found a significant

logarithmic relationship between the size of remnant area and the total number of bird species recorded in that remnant. Some woodland birds like the Hooded Robin and the Brown Treecreeper require large territories for a pair of birds to successfully breed. The maintenance of viable populations is only possible in large remnants or areas where small remnants are well connected.

The above scientific data is part of the reasoning behind both the Murrumbidgee Catchment Management Authority and the ACT Natural Resource Management Committee, setting as a target that areas managed for biodiversity conservation should include "a minimum of 30% of the Pre-European extent of each vegetation community occurring in the ACT." It is also a major part of the reasoning as to why the Commonwealth has linked NHT funding to a commitment by the ACT to "where possible manage a minimum of 30% of the pre-European extent of each vegetation community for biodiversity conservation".

The ACT is relatively fortunate that it still retains 69% of its original extent of native vegetation. However clearing has been concentrated on Canberra's Plains and the Murrumbidgee Valley. Mitchell (2002) classified the landscapes of NSW and the ACT into several hundred landscape types, mapped on the basis of landform, soils and geology. Figure 1, maps the landscape units for the ACT. As part of a tool for assessing vegetation clearance activities in NSW, the percentage vegetation clearance for each Mitchell landscape system was determined (Gibbons et al 2005). The tool, which has been adopted by the NSW Government, prohibits further clearing of native vegetation in landscapes where 30% or less of the native vegetation is retained, or of vegetation types that have suffered a 30% or greater level of clearance.

As illustrated in Figure 1, the Mitchell Landscape type called Canberra Plains corresponds closely to the region's urban settlement. According to Gibbons et al (2005) 83% of this landscape type has been cleared, while 88% of the Upper Murrumbidgee Channel and 73% of the Upper Murrumbidgee Gorge landscape types have been cleared. Most of the 17% of vegetation left on the Canberra Plains occurs on rocky and steep hills and ridges. The vegetation on these poorer sites is less productive, in terms of leaf growth, nectar flow and insect populations, than trees located on nutrient rich, deep and relatively moist valley flats. Trees lower in the landscape also tend to be bigger and contain many more hollows. Thus prime fauna habitat has been particularly heavily cleared. This is true of both Red Hill and Gunghalin. For example, about 75% of the new Goorooyarroo Nature Reserve consists of slopes greater than 10% and above 650m in altitude.

Red Hill forms part of one of the largest remaining fragments of Yellow Box - Red Gum Woodland in south-eastern Australia. Much of the vegetation within the Canberra Plains, is either this woodland type or native grassland. Approximately 66% of Red Gum - Yellow Box woodland has been cleared in the ACT, and 90% of it has been cleared in the region. (>90% of the native grassland has been cleared in both ACT and region), Both Red - Gum Woodland and Temperate Grassland are endangered ecological communities and are the main habitat for the majority of ACT's threatened species.

The ACT's urban vegetation has suffered such a high degree of clearance and fragmentation that it can only be expected to contain a depauperate biodiversity, that will continue to decline, unless the extent of native vegetation is increased.

3. CURRENT NATIVE VEGETATION MANAGEMENT IN THE ACT

Instead of being committed to expanding Canberra's urban vegetation, ACT's governance results in its continual chipping away through urban expansion and utility and infrastructure construction and maintenance.

Currently there is no general prohibition of clearing of native vegetation in the ACT. Restrictions on clearing vegetation only apply to large suburban trees, native trees on leased and unleased land (where a permit is required), endangered communities and areas supporting endangered species (but only in certain circumstances), and vegetation immediately adjoining a watercourse or on very steep slopes. Unlike NSW, Victoria or South Australia there is no legal requirement that vegetation clearance must be offset by planting/regeneration elsewhere in the local landscape.

The Commissioner for the Environment (2004) reports that between 2000 - 2003, 17ha of endangered woodland was cleared for urban development, along with small areas of other woodland and 85 hectares of paddock trees. The Commissioner also notes that the expansion of Gungahlin will result in the clearance of 660ha of endangered woodland, 530ha of other woodlands and 600ha of paddock trees.

During the three year period that 102 ha of native vegetation (including paddock trees which were prime fauna habitat) was cleared, 688ha of Nature Reserve was created. At first reading this sounds a plus for biodiversity. However, where as this reservation may result in an improvement in the quality of vegetation, this reservation has not resulted in an increase in the remaining extent of critically cleared vegetation or decreased the level of landscape fragmentation or clearance within overcleared landscape types. Rather than trying to restore a landscape in trouble, current vegetation management is largely aimed at reserving only those areas of high quality vegetation, a fraction of the the remaining 17% of native lowland woodlands and grasslands.

Action Plans have been produced by the ACT government for ACT's lowland woodlands and grasslands. These Plans contain excellent information, and the stated vision, goals and principles are admirable. Unfortunately the rhetoric is not reflected in actions. The Plan could be directed at woodland and grassland recovery, with actions that guide an increase in the extent, condition and connectivity of urban vegetation. However, the major actions of the Plans appear to condone further vegetation reduction and at best maintenance of the status quo.

A major reason for the "lets only protect the high quality bits" mind-set appears to be a belief, embedded in the planning process, that biodiversity values cannot be restored to cleared landscapes. For example, the Act Lowland Woodland Conservation Strategy ignores consideration of those situations where Yellow Box or Red Gum trees occur over exotic pasture or where exotic perennial cover in the understorey layer exceeds 50%. Rather than seeing these areas as potential sites for biodiversity restoration and maintenance it is claimed that these areas are "effectively irretrievable". This claim is unsubstantiated – it is not supported by citations from the literature, nor by case studies of failed attempts at regeneration in the ACT.

This claim is contrary to the experience of the Red Hill Regenerators and probably

every other Park Care Group in the ACT. As little as 10 years ago there were five large areas (>20ha) on Red Hill that had an understorey that would, at that time, have been described by the lowland woodland strategy as "effectively irretrievable." They are now high quality woodland.

Spooner et al (2002) found that when Box -Gum woodlands over exotic pastures are fenced off from grazing, within a period as short as 2-3 years, changes in the understorey favouring perennial native grasses over exotic annuals can be observed. Although fencing alone is insufficient to restore the diversity or complexity of the pre-pasture understorey, research does show that exotic pasture can quickly be converted to a native dominated understorey that contributes to the viability and functioning of woodland remnants. Another key finding of Spooner et al (2002) was that if "substantially" modified woodland is fenced, within two years the recruitment of trees is greatly enhanced.

All of ACT's threatened bird fauna, including the Hooded Robin, Swift Parrot, Superb Parrot, Brown Treecreeper, Painted Honeyeater and Regent Honeyeater are regularly recorded in NSW utilising patches of Yellow Box - Red Gum woodland where native trees occur over a predominantly exotic understorey. Regeneration activities in and around the city of Albury are instructive. Since 1975 the Albury Wodonga Corporation has undertaken forward tree and shrub plantings in agricultural land in advance of residential expansion. The majority of these plantings occurred within cultivated paddocks in which isolated paddock trees and small tree clumps remained. Twenty to thirty years on, the plantings support a predominantly native understorey (albeit of low diversity). More significantly the combination of large mature trees and understorey plantings is now significant habitat for many species listed as threatened in NSW including: the Squirrel Glider (largest known population in NSW), Speckled Warbler, Diamond Firetail, Regent Honeyeater (a known breeding location), Black-chinned Honeyeater, Swift Parrot (largest flocks recorded in the Murray Catchment) and Hooded Robin. Apart from the Speckled Warbler, these species are not found in the wooded hills above Albury, although the hills support a large extent of white box woodland/forest. Albury and ACT have in common that exotic species generally form the understorey of remaining woodland elements low in the landscape. It seems probable that as is the case in Albury, these lowland elements in the ACT could play an important part in woodland fauna recovery (see Davidson I and Datson G (2003) *Thurgoona Threatened Species Conservation Strategy*, a report for the Albury-Wodonga Development Corporation copy attached, along with a planning document for Mitchell Park (a new suburb within Thurgoona).

The *Thurgoona Threatened Species Conservation Strategy* is the winner of a Royal Australian Planning Institute Award. It is illuminating that in Albury a strategy for maintaining biodiversity within an urban area, has identified as key habitat and connectivity areas, isolated paddock trees and plantings that link with remnant vegetation patches and will result in over 30% of the landscape being vegetated. In contrast, on the Canberra Plains our planners are content to disregard "poor quality" areas and strive for reservation of good condition vegetation that will result in 15% of the landscape being vegetated, with connectivity predominantly along hills and ridges. Consequently, it is no surprise that the threatened fauna populations around Albury are stable and for some species amongst the largest anywhere, while those around Canberra are in decline.

3.1 What the "fence around the best bits" planning approach has meant to Red Hill.

Hindmarsh Drive cuts across the southern end of Red Hill, but for many plant and animal species, this road is not a total barrier. Because of this connectivity, Red Hill can be considered part of the Callum Brae - Jerrabomberra Red Gum - Yellow Box remnant. This is one of only three remnants over 1000ha in size of this woodland type remaining. Red Hill Regenerators have been distressed by the chipping away of this nationally important remnant for various development activities, and in particular, the urban expansion at East O'Malley.

ACT government planners justified the loss of 30ha of woodland at East O'Malley, through a 90ha expansion, over adjoining woodland, of the Mugga Mugga Nature Reserve. The planners claimed that the 30ha area was in poor condition, and certainly it did have a greater weed cover, but this is only one measure of condition.

In contrast, the Red Hill Regenerators recognised that the creek-flat woodland at East O'Malley was fundamentally different to that of the adjoining Mugga Mugga slopes, that it provided a habitat unique within the larger Callum Brae - Jerrabomberra woodland, and that its loss was likely to lead to the loss of biodiversity on Red Hill.

The woodland at East O'Malley is classified by Thomas et al (2000) as Western Slopes Moist Herb/Sedge/Grass Woodland - *Eucalyptus blakleyi*/*Carex appressa*. This alliance occurs on small depressions and flat gullies in the upper catchments of major rivers and creeks, between 400 and 650 metres elevation from the Central Tablelands through to the eastern part of the South-West Slopes. The mapped remaining extent of this community between the Hume Highway and the Coast is only 170ha. The now cleared woodland at East O'Malley was the only example of this vegetation type exceeding 10ha in area.

East O'Malley contained a permanent creek and a complex structure of mature and regenerating Red Gums growing on fertile alluvial soils. From the viewpoint of a woodland bird this is a top quality environment. This type of habitat is now exceedingly rare as it is readily converted to prime agricultural land. It is no co-incidence that eleven species of rare, threatened or seriously declining woodland birds have been recorded at East O'Malley, and that most of these birds bred there. It was the only known breeding location of the Little Eagle in the Canberra area, and one of only a few known breeding locations in the ACT of the Diamond Firetail, Varied Sittella and White-winged Triller - the last three species are now listed as threatened in the ACT. The Diamond Firetail occasionally nests on Red Hill, while the other three species were regularly seen on Red Hill and probably foraged out from their nests at East O'Malley.

The habitat and vegetation community values of East O'Malley were not recognised by the planning process, and neither was the issue of continual vegetation loss in an over-cleared landscape. The result was a new fence around an extended Mugga Mugga Reserve, but loss of the most critical vegetation. Since the clearance activity at East O'Malley, none of the four above mentioned bird species have been seen on Red Hill.

An approach that focuses on remaining high quality vegetation, also fails to see the potential of landscape rehabilitation. For example, a restoration vision would see native vegetation along the banks of Yarralumla Creek, and thus the connection of Red Hill to



this Creek as important. Currently this connection is via a wide belt of plantings parallel to Carruthers and adjacent to Kent streets. There is inadequate planning protection for this connection and it is threatened by proposed development of the former Deakin Telecom land. Similarly the connection of Red Hill to Stirling Ridge in Yarralumla could be improved, for birds at least, by shrub plantings along Melbourne Avenue and care of the large yellow box trees located along the median of this avenue.

3.2 The result of the "fence around the best bits" planning approach in Draft Variation to the Territory Plan No 231.

The above draft variation will result in significant degradation of arguably the most significant box-gum woodland remnant remaining in Australia. Under the Draft Plan, development will reduce the remaining woodland remnant by about 20% and add significantly to the level of vegetation clearance in an over-cleared landscape. As was the case in East O'Malley, it will destroy key habitat areas. The plan also severely restricts the possibility of ecological restoration across the East Gunghalin area. Approximately 50% of the area contains sufficient tree and/or understorey cover and could potentially be the focus for the regeneration of native vegetation. However, most of this area is destined to be bulldozed.

The draft plan bases reserve design and biological conservation largely on vegetation condition. It is poor planning; - divorcing planning from the landscape context is a recipe for biodiversity loss. Unfortunately it is all too easy to back up this claim by examining the proposed Goorooyarroo Nature Reserve design. It contains the following aspects that are likely to lead to poor biodiversity outcomes.

- i. Scarcity of riparian habitat: The majority of East Gunghalin's streams and creeks lie outside of the area to be reserved. Across a wide range of habitats, riparian areas and drainage lines tend to be the most productive for biodiversity and play an important refuge role (e.g Seddon et al. 2002). This applies even in woodland landscapes much more heavily degraded than those at Gunghalin. For example, in the Holbrook Landcare area (as detailed by CSIRO researchers in the "Heartlands" project) heavily degraded creek lines are critical for maintaining viable populations of many threatened species. Informed planning for biodiversity would have incorporated a much greater representation of the creek environments within protected areas than has been the case.
- ii. Predominately hill slopes: The new reserve is largely composed of hills and slopes with relatively shallow soils. Around 75% of the new additions are of slopes greater than 10% and above 650m in altitude. However, trees growing on the flatter land in deeper soils tend to be larger, contain many more hollows and provide a much richer nectar and insect resource. Although the trees on the flats may be somewhat isolated, and surrounded by a relatively weedy understorey, they are probably the key habitat element for several of the threatened woodland birds recorded in the Gunghalin area including the Swift Parrot, Superb Parrot, Regent Honeyeater and Painted Honeyeater. The hollows are likely to be important for maintaining local populations of several animals such as parrots and bats. A finding of the CSIRO "Saltshaker" project was that fencing off isolated paddock trees, and allowing eucalypt regrowth to occur around the base of the tree, enabled many bird species, including threatened species like the Hooded Robin, to return to highly modified landscapes. If the functioning and viability of the woodland ecosystem had been a planning priority the plan would

have included as many as possible of the big paddock trees on the flatter areas within the protected area.

- iii. Large edge to area ratio: The present planning will result in a large boundary to area ratio for the new reserve area, meaning that a large part of the remnant will be subject to edge effects. Just about every book ever published on park management identifies that this will have an undesirable outcome. Resultant impacts include obvious things like weed invasion. The proposed fuel-reduced "buffer" area will provide the ideal environment for invasion by perennial exotic grasses which will then provide a major risk to the long-term viability of remaining woodland. Other edge effects may not be so obvious but ultimately may have adverse impacts that are just as significant. Edge areas of remnants may not be inhabited by some bird species because of higher nest predation, or decreased habitat quality from effects of increased exposure to wind and/or solar radiation (Zanette 2000, Ford et al 2001). A reserve design that had ecosystem functioning as a key element of consideration would be one of a circular shape. The design proposed is more like the letter E and seems to try and maximise the length of boundary. A park boundary which included all land east of Horse Park Drive would be more in keeping with ecological principles and the long term viability of Gunghalin's woodland remnants.
- iv. Built-in bottleneck: The proposed planning imposes a bottleneck in relation to the continuity of woodland habitat, with the northern extension of Throsby constricting the woodland to a width of less than 400m. It is worth noting that this corridor largely consists of sloping land and seems to be a transition area between woodland and forest. It may not provide suitable habitat to facilitate the dispersal of some woodland species, particularly those more common on lower land.
- v. Lack of key habitat consideration: The planning and impact assessment performed to date fails to identify the key habitat features and areas utilised by threatened species recorded in the area. Thus, there is no certainty that crucial habitat will not be destroyed by the proposal.

The need for a proper Assessment is amply highlighted by the statements on page 71 of the Preliminary Assessment. There it is stated that the fauna survey consists of "*Opportunistic sightings during a survey in March 2001*" and that "*Systematic bird survey has not been carried out in the Gooroo area*". This is despite the statements in the Act Lowland Woodland Conservation Strategy (2004) that the Gooroo - Mulligans Flat area "*contains extensive habitat for many threatened and declining bird species, with records of Hooded Robin, Brown Treecreeper, White-winged Triller, Varied Sittella, Painted Honeyeater, Regent Honeyeater and four species of declining woodland birds. Recent COG records indicate declines in the Hooded Robin and Brown Treecreeper at Mulligans Flat..The Golden Sun Moth, Key's Matchstick Grasshopper and the Black-headed snake (Suta spectabilis dwyeri), an uncommon reptile in the ACT, have been recorded in Mulligans Flat Nature Reserve.*

There should be surveys for each of the above mentioned species, and key habitat elements for their continued survival should be identified. Planning should be based on actual information, not unsound assumptions. The Mulligans Flat -

Gooroo area is one of the most important habitats remaining in the ACT for the Brown Treecreeper and Hooded Robin. The fact that they are declining within the existing remnant, prior to the massive loss of habitat that will result from the enacting of the proposal, dictates that a precautionary approach should be adopted. Planning should have required the identification of what areas these birds are utilising, potential habitat that could be enhanced or restored and key features required for their ongoing survival. As was the case for East O'Malley, there is nothing in the public planning documentation to provide confidence that the proposed development will not be the death-knell for Gunghalin's threatened woodland birds.

4. WHAT FUTURE LANDSCAPE PLANNING IN THE ACT SHOULD INVOLVE

The glaring lesson from both Gunghalin and Red Hill is that if biodiversity is to be integrated into land-use planning then this planning needs to take a landscape approach. It needs to consider that vegetation is dynamic and that habitat elements such as degraded creek lines and isolated paddock trees can be crucial to retaining biodiversity.

Planning needs to consider the full range of biodiversity values and key habitat requirements. It should not just rely on current vegetation condition. It is incomprehensible that, although the ACT Government has an established set of criteria for nominating natural and historic sites to the ACT Heritage Register, these same criteria are not used to describe the conservation values of an area in the ACT Government's planning documents. Perhaps use of these criteria would go some way to addressing the current inadequacy in identifying conservation values, unfortunately so readily apparent with the East O'Malley and Draft Variation No 231 planning documents.

Given the high level of vegetation clearance on the Canberra Plains, it is also essential that planning adopt a principle of net gain in vegetation coverage. Failure to do this is sentencing the vegetation in the urbanised parts of the ACT's to a future of low level biodiversity and second rate conservation.

4.1 The principle of Net Gain

The no net loss *Nature Conservation (Native Vegetation Protection) Amendment Bill 2004* was presented to the ACT Assembly on 30 June 2004, by the Democrats. The Greens supported the Bill. The Liberal Party was supportive of the aspirations of the Bill, but would not support the Bill without a Regulation Impact Assessment. This would examine the likely economic and social costs of a native vegetation regulatory regime and more clearly define the problem being targeted and the expected benefits, as well as an assessment of alternatives. Ms Dunne, the Liberal party spokesperson hoped the matter would be revisited early in the next Assembly.

The Stanhope Government did not support the Bill. Green 'offsets' were seen as having some merit for reducing loss of vegetation across the landscape, but as having limited value in a nature conservation context, the reason given being that ecological communities cannot be reproduced through planting. This statement is true, but offset activities should not be viewed as replacing what is cleared. Rather, they enhance the remaining vegetation remnants to an extent that exceeds the biodiversity loss resulting

from the clearing. This explains why required off-set areas, under the vegetation legislation in other States, are generally substantially bigger (usually at least 5 times) than areas being cleared.

The Labor Party have acknowledged that there was scope for improving vegetation management but stated that narrowly focused, administratively cumbersome and ill-thought through legislation was not needed. Labor thought that the conservation of native vegetation was best served by strategic application of existing legislation. Labor was also concerned that the Bill would have particularly affected farmers and other land managers as well as the development and construction sectors. There was also concern that the Bill would lead to considerable delays in development approvals.

The Red Hill Regenerators would like to suggest that one of the roles of the Standing Committee on Planning and Environment should be to find a way for the principle of net gain to be inscribed within ACT's planning legislation, while overcoming the above-noted concerns.

There are many ways that this could be done but the following suggestions appear to address the above concerns.

4.2 The potential for embedding the "Net Gain" principle within the *Land (Planning and Environment Act) Bill 1991*.

The net gain principle could be embedded within the current development assessment process. This is the approach adopted by the Victorian government, where a development application to clear vegetation is only approved if a developer is able to prove that: (i) there are no alternatives to the clearing of the vegetation; (ii) the extent of clearing is being minimised; and (iii) an appropriate offset will be put in place. Under this system the offset cost and task of finding an appropriate offset is born by those wanting to do the clearing. Such an approach would not add a layer of bureaucracy and would add little to approval time or consideration. The creation of off-sets is likely to be a boon to local landowners as many (perhaps the majority) do not have agricultural production as their primary focus and are likely to actively seek off-set payments or actions to assist the natural regeneration of parts of their properties.

A disadvantage of embedding the principle as part of development approval is that it would not cover all clearance activities. As detailed in following sections, considerable clearance of Canberra's urban vegetation results from on-park management activities and the installation and management of utilities. It should be a standard practice that any clearance activity must be offset by actions that are expected to result in a gain in overall vegetation extent. However, if developers identify their own offset areas this may result in ad hoc offsets unrelated to regional priorities.

4.3 Clearance activities and offsets overseen by independent body

Changes could be made to both the *Nature Conservation (Native Vegetation Protection) Amendment Bill* and the *Land (Planning and Environment Act) Bill 1991*, to establish a new independent body or perhaps empower the Commissioner of the Environment to both assess vegetation clearance and oversee landscape restoration through incentive programs. This is similar to the South Australian and proposed NSW systems.

It is clearly beyond the scope of this submission to undertake a Regulation Impact Assessment on the above proposals. However, the following ball-park figures are provided as an indication as to what such an assessment may find. In NSW landowners have accepted payments of between \$20 - \$50 per hectare from Catchment Management Authorities in return for managing areas for conservation. In this scenario, we assume that a developer wants to clear 1ha of woodland and the offset includes improving a nearby 5ha area of paddock trees and low diversity native pasture, and that the developer is required to pay for 30 years of conservation management. This would be a cost of $\$50 \times 5 \times 30 = \7500 . With the addition of set up costs such as fencing and planting, the cost per hectare cleared would be between \$10,000 - \$12,000.

Currently the development (including the development arm of the government), infrastructure and construction industries externalise the biodiversity costs from their clearing to ACT's future generations. The level of clearance on Canberra's Plains already exceeds a sustainable level and needs to be redressed. This is particularly so in the context discussed below that even within lands reserved for conservation purposes there is a continuing and significant loss in vegetation cover.

The ACT Red Hill Bush Regenerators understand that the Conservation Council has made a submission which examines the concept of "net gain" in greater detail than it is dealt with in this submission. We recommend to you their ideas.

5. MANAGEMENT OF CANBERRA'S REMNANT VEGETATION INCLUDING THAT WITHIN FORMAL CONSERVATION RESERVES.

For the last 16 years the ACT Red Hill Bush Regenerators have been involved in the management of ~375ha of the Red Hill Nature Reserve and ~75ha of adjoining open-space and other land that supports endangered woodland. Over that period the woodland remnant on Red Hill has been subjected to 15 development activities, 13 of which had at least a part of the activity within the Reserve. The developments include a communication tower, gas pipeline, fibre optic cables, construction of fire trails, clearing of cut-off drains, construction of a pump-house and works to power and water infrastructure. In addition the Hill has been subject to a further 10 major management activities including cattle grazing, clearing of easements, removal of features of potential cultural significance and inappropriate plantings. These development and intrusive management activities are detailed in Appendix 1.

The developments have resulted in total clearance of several hectares on Red Hill, the removal of hundreds of trees and thousands of saplings and shrubs, the spread of weeds, the destruction of many hundred plants of species that are nationally or regionally rare, and significant degradation of the Hill's prime fauna habitat. To our knowledge, impact assessment documentation has never been produced for any of the activities. This

thoughtlessness is particularly disappointing as the impacts for most of the activities could have either been avoided or substantially reduced.

5.1 Nature Reserve or infrastructure landbank?

It would appear that Red Hill is not alone in its high level of development activity. At a Parkcare meeting about a year ago, representatives from the ten groups present were asked whether there was current on-reserve development activity on their parks. Five groups replied in the affirmative, with developments including a fibre optic cable, a major road development, and significant powerline and water supply works. Again the level of impact assessment was negligible, and measures to reduce impact either non-existent or unrelated to the particular values of an area. A recent example that would be farcical if it had not resulted in significant impact was the case on Mt Taylor, where ACTEW workcrew refused to move heavy vehicles that were parked upon nationally endangered temperate grassland and habitat of threatened species.

The current legislation allows Canberra's nature reserve system to be viewed as a landbank for infrastructure development. If one was to add up the total area of Canberra Nature Park that was placed within an infrastructure corridor over the last ten years, the total area would be staggering. The legislation needs to be changed so that infrastructure

would only be allowed within a reserve as a last resort and after demonstrating through public documentation that there really are no prudent and feasible alternatives, that impacts have been minimised to the highest practical level, and that if impacts are unavoidable, off-set measures are in place. The present degradation of our reserves at the whim of cost-saving and convenience gains of the infrastructure industries needs to end.

5.2 The need for on-reserve management plans and environmental review of on reserve clearance/disturbance activities

Examination of the table in Appendix 1, also highlights that maintenance and general park management activities have resulted in adverse impacts on Red Hill and cumulatively have resulted in significant degradation. Many of these impacts have been by ACTEWAGL or their consultants. ACTEWAGL does not have environmental management plans that guide its work on Red Hill or other reserves. Its workers demonstrate that they are given inadequate instruction on how to minimise their impacts when they are working within endangered vegetation. How else could you explain:

- i. the dumping of a truck-load of weed infested spoil on top of native understorey;
- ii. the driving of a vehicle on a wet day across the major Red Hill population of the nationally endangered Button Wrinklewort, killing several plants;
- iii. the felling of shrubs and small trees that had reached their full heights and were still in excess of 20-30m from any powerline;
- iv. the worker who slashed the thistles around a water tank and then spread the slashed material over the surrounding bush (and over a population of a threatened plant species);
- v. the workers who leave the debris from powerline repairs scattered on the Hill;
- vi. the lack of any rehabilitation of areas disturbed for power pole erection or water pipeline repair, with areas still bare or weed covered several years after the activity; and
- vii. the workers who decided to clean the cement mixer over significant native understorey and run the cement laden water down slope.

It is amazing that an organisation that runs Green Choice and champions the case of sustainable water use, does not have an environmental management unit that guides and audits its own on-ground activities. ACTEWAGL should be made accountable for its activities within ACT's vegetation and corridors. As part of being allowed to continue operation within Canberra Nature Park, it should be required to establish a small unit that prepares, explains to its workforce, and enforces environmental management plans for each reserve area. The unit should also be responsible for conducting environmental impact assessment prior to new development or significant maintenance activities. This need not necessarily be to a level of an EIS, but it should at least be the equivalent of the Review of Environmental Factors that they are required to do, under Part 5 of the *Environmental Planning and Assessment Act* for any of their activities in NSW.

ACT Red Hill Bush Regenerators wrote to ACTEWAGL on 9 December 2003 and again on 14 April 2004, suggesting that it develop a management plan for its operations on Red Hill, with the aim of minimising its environmental impacts. While they have improved their environmental performance they have not produced a plan. It is hoped that pressure from the Legislative Assembly may bring this about.

Canberra Nature Park does have an existing management plan, for Park staff and Parkcare groups, which does provide a framework for management activities. However, a management plan alone can not provide the level of information and guidance required to prevent inadvertent and unnecessary impacts from management activities that involve vegetation clearance or physical ground disturbance. For example a plan may delineate the construction of a new fire trail, but the exact route of that trail should only be determined after inspection to see whether any Aboriginal sites, significant flora or key fauna habitat features may exist in the vicinity. Experience on Red Hill, as detailed in Appendix 1, is that this on-ground checking is not happening or if it is, it is happening in a cursory, poorly documented way. The various fuel-reduction activities are unfortunately a classic example. Some regionally rare or nationally threatened plants were protected from direct clearance, but prime fauna habitat was not protected. Red Hill Regenerators are not opposed to reducing fuel to safe levels, just the poorly thought-out works program which did not appear to consider:

- i. Is there a way of maintaining some clumps of shrub habitat for the threatened and declining woodland birds for which the lower slope area is key habitat?;
- ii. Could slivers or clumps of silver wattle be kept to provide both food and movement corridors for sugar gliders across the area?;
- iii. Do we really need to have a blanket 50m clearance above the cut-off drain-when for some sections of the Hill, houses are not backing on to the reserve?;
- iv. If we remove shrubs, saplings and small trees will that allow vehicle access to parts of the Red Hill remnant that were previously protected from vehicle traffic and if so what measures could we take to restrict this access?;
- v. Do we really need to remove the shrub in which the threatened Diamond Firetail is known to breed? and
- vi. How can we ensure that the vehicles and machinery used in the activity are not introducing weeds or pathogens to the reserve and have taken sound hygiene measures?

On-reserve activities that clear vegetation or involve physical soil disturbance should be subject to a standard level of impact assessment. This should include a checklist of environmental impacts based on knowledge of the environmental values within the area of activity and how the activity might impact on these values. Red Hill

Regenerators suggests that something like Part 5 of the NSW *Environmental Planning and Assessment Act* should also apply to on-reserve management activities.

The Committee on Environment and Planning should also ensure as an imperative that any new development is designed or set-back far enough from the boundary so that all bush-fire safety requirements are met on the development land and do not require management actions on neighbouring land. New developments bordering conservation reserves or open space, should not require clearance or thinning of native vegetation on public land. Nor should they restrict the future revegetation of these areas. The Red Hill Regenerators Group understands that the rural fires and planning acts in NSW were recently changed to specify that required fire protection measures must be able to be contained within the development land. The same should apply in the ACT.

6. ENVIRONMENTAL IMPACT ASSESSMENT IN THE ACT DESPERATELY IN NEED OF REFORM

6.1 The need for all activities that could impact urban biodiversity + conservation values to be assessed

The ACT Red Hill Bush Regenerators strongly support the reform of ACT's environmental impact assessment that is currently underway. However, we would like to re-iterate a word of caution. As detailed in the previous section, ACT's urban vegetation and wildlife corridors are being whittled away by many actions that do not require development applications. The actions are also of a type that have a high cumulative impact, but in themselves would mostly not be judged significant enough to warrant production of an Environmental Impact Statement. Quite often the avoidance of unnecessary impact on important conservation values can be as simple as deciding where machinery and vehicles should be parked, or redirecting the placement of a 20m length of cable. Although we recognise the shortcomings of the former Preliminary Assessments, we consider there is a crying need for impact assessment legislation, within ACT, that ensures that those engaged in activities answer the simple question:

Does the proposal have potential for environmental impact?

And, if so:

How could such impacts be avoided or ameliorated?

The ACT Red Hill Bush Regenerators suggest that the Assembly Committee look towards establishing a system that requires that the potential for environmental impact of all activities affecting ACT's native vegetation must be examined and assessed. This examination and assessment could be by the proponents themselves, but at the very least their actions and reasoning should be documented and conveyed to all those involved in the activity.

A useful model may be the NSW's *Environmental Planning and Assessment Act* (Part 5), together with the "blue book" guide to the interpretation of the Act.

Whatever approach is taken, it should be clear that reliance on assessment through the development approval process and the listing of designated developments will not be sufficient to protect ACT's urban vegetation and

corridors from significant environmental impact.

6.2 Failings of the old impact assessment process

The ACT Red Hill Bush Regenerators were frustrated and angered by the lack of due process and consideration given by the Government with regard to the East O'Malley residential development. As detailed below the impact assessment produced for this development:

- i. failed to identify key conservation values;
- ii. did not involve any site specific fauna surveys (instead relying on broad scale contextual surveys conducted by the government);
- iii. ignored public comment and even when considerable conservation values were pointed out to the government the project was not changed one iota from the original proposal; and
- iv. involved a blurring of roles between the government as a developer and the government as an assessment and approval body.

These points are discussed below, in order to provide support to the reform process as detailed in ACT Planning and Land Authority (2005).

6.3 Lack of adequate description and assessment of conservation significance for biodiversity found within a development area

Impact Assessments produced for developments across Canberra have consistently understated the value of Canberra's box-woodland and temperate grassland remnants. In terms of areal extent, plant biodiversity and threatened species habitat, ACT's urban remnants are of national importance. Remnant size is a crucial factor for it is in the large remnants that ecosystem functions and biodiversity have the best chance of surviving. The developments at East O'Malley and the suburbs of Kenney and Throsby adjoin the second largest and largest remnants of Yellow Box - Red Gum woodlands in Australia. Both remnants exceed 1000ha. There are no remnants of this vegetation type in southern NSW greater than 200ha (Rainer Rehwinkle NSW DEC pers comm), none in Victoria above 100ha (Kath Stothers VIC DEC pers comm), while only a few remnants of 250ha or more exist anywhere in Australia (Mulvaney 2002). Impact assessment documents continue to ignore this feature of significance. Instead of treasuring and enhancing our large woodland remnants, these documents allow development approvals that reduce woodland extent and quality. There can be no doubt that the viability of Yellow Box - Red Gum woodland in the ACT is best achieved by retaining and enhancing the existing large remnants - not the nibbling away of these areas.

Flora and fauna surveys accompanying ACT's impact assessment documents have nearly always been cursory in nature and generally consist of observations made while walking (frequently over a period less than a day) around the proposal area. There is very rarely any fauna trapping or targeted survey, or consideration of species that may use the site but are not observed on the walk. These include resident nocturnal species, species for which the site is part of a larger territory, and species which use the site or are only visible in certain seasons. This rudimentary survey approach might be acceptable if preliminary assessment was just that and that further work would eventuate - but this has not been the case even when recommended by the sub-consultant doing the initial survey. Thus at East O'Malley the assessment, done over two half-day walks around the site in May, found that the site was of conservation significance and of importance to woodland birds but failed to recognise all significant

features. It also failed to provide a map of the extent of the habitat, or habitat features important for the survival of these woodland birds. It was up to the conservation groups to provide such information. The bird-list quadrupled with further observation, and included many sightings of threatened and declining woodland bird species breeding in Spring/Summer. This new information was not taken on board. Indeed the government failed to acknowledge it, and the design of the proposal remained unchanged throughout the assessment process. Similarly, the assessment for Gunghalin Drive failed to mention either orchid or fungi flora's that were documented elsewhere as of national significance. Prior to the construction of the sewer main that dissected the Gungaharra Nature Reserve there was no targeted survey for the Golden Sun Moth or Perunga Grasshopper along the pipeline route, despite both these threatened species being recorded within the Nature Reserve. Finally, the planning study for Throsby and Kenny was confined to surveying vegetation condition, although over a dozen threatened species of fauna are known to, or are likely to occur in the general area.

The flora survey of East O'Malley was conducted at a time of year when many plant species were difficult to recognise, and it is not surprising that the sedge, *Carex bichenoviana* was not recorded by the sub-consultant. The now bulldozed creek was one of only two known records of this plant amongst the 270 woodland sites surveyed in the ACT and surrounding region (Grassy Ecosystems Database - held by Rainer Rehwinkle NSW NPWS). It may now be extinct within Canberra's remnant vegetation.

East O'Malley provided suitable habitat for the threatened Pink-tailed Worm Lizard and the Perunga Grasshopper. Both had been recorded in the woodland remnant of which East O'Malley was a part. In the case of the worm lizard there were two separate records within 200m of the development site. No site specific surveys for these species were carried out (except illegally by untrained local residents who located a blind snake but no lizards).

In the Preliminary Assessment for the Mugga Resource Recovery Estate, Alison Rowell (2001) rated 4ha of Box-gum woodland as having high conservation value and directed development away from the woodland as this area was "*a Blakely's Red Gum/ Carex appressa swamp, and is one of the largest remaining examples of this type of community (I. Crawford, pers comm.). The swamp area contains about six Red Gums, some dead trees, and one small willow.*" About 15ha of this same community, consisting of an overstorey of over a hundred mature trees, once existed at East O'Malley, but this was not even recognised in the East O'Malley PA done only a year prior to the Mugga PA. Instead there was a glib description of Yellow Box - Blakely's Red Gum woodland and an implicit assumption that all such woodland was the same across the ACT. Unfortunately this was also the opinion pushed by government planning and environmental officers.

The reform of ACT's impact assessment methodology should include the establishment of minimum standard guidelines for flora and fauna survey and reporting.

Because the PA failed to recognise the conservation values of East O'Malley it also failed to address the potential impacts of the proposal on these values. The consideration of impacts that the PA did contain was woefully inadequate and ecological nonsense. For example, the PA assumed that the habitat values of trees retained within a housing estate would be the same as for those within a woodland

remnant, and it failed to consider indirect impacts of the development including garden escapee's, predation by pets, control burning, dumping of rubbish (on Red Hill roads close to houses have proved to be dumping spots), increased feral bird populations, wood collecting or spread of environmental weeds.

It was an environmental travesty that at East O'Malley the government approved the siting of housing over endangered woodland while leaving weed paddocks as open space and turning a pile of builders rubble into a large dam. The ACT Red Hill Bush Regenerators believe that the decision not to prepare an EIS for the project can only be described as skulduggery. Certainly there should be a mandatory requirement to produce an EIS prior to approval of a development of this type. Hooray for the proposed changes!

6.4 Conflict of Interest

East O'Malley's assessment and approval process was under the control of Planning and Land Management (PALM) rather than the newly created ACT Planning and Land Authority. We hope the changes have resulted in a cultural change, for our impression of PALM was that it had already made a decision on where and what scale of development would occur at East O'Malley prior to the impact assessment process and that relevant information was understated or ignored in order to justify the pre-ordained outcome. The Wildlife and Ecology Unit (WEU) seemed to be a willing accomplice in shoring up the pre-ordained position, actively arguing against evidence presented by our and other groups. The WEU seemed to take new evidence (such as the on-site breeding of threatened bird species) as a personal slight to their professionalism that needed to be defended against - rather than embraced as information that would assist decision making. It is hard not to feel anything but cynicism that three weeks after the bulldozers had cleared much of East O'Malley, the government decided to list two bird species that used to regularly breed there (the White-winged Triller and Varied Sitella) as threatened species in the ACT.

The balancing act within PALM, where the roles of developer, critical assessor and approver of the development were intertwined, beggared credibility. It is hoped that the planning system reform will establish transparent approval and assessment roles independent of those who have produced the planning or development documentation.

The ACT Red Hill Bush Regenerators are concerned that under the proposed impact assessment reforms, changes to the Territory Plan will be assessed via a planning study. The concern relates to our lack of confidence in the ability of ACT's government planners and environmental officers (from the Conservator down) to deliver an unbiased and adequate study. After all, these are the same people who saw it fit and proper to never require the production of an EIS from amongst the 186 preliminary assessments completed. Also, they were the people who accepted that a days walk around an endangered woodland remnant of national significance was sufficient to judge the impact of potential developments on the flora and fauna that occurred there. They are the people who have shown a disregard for gaining a comprehensive understanding of an areas conservation values. Finally, they are the people who accepted widely different assessment standards and seem to have as their consultants of choice those who produced the most inadequate documentation. It will take a major turn-around in performance to begin to restore any level of confidence.

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Appendix 1. – DEVELOPMENT ACTIVITY ON RED HILL SINCE 1988

Year	Development Activity	On Reserve	Adjacent to Reserve	Impact Assessment undertaken	Summary Of Resulting Impact
Pre 1988 – 2005 varied times + length	Dumping of gravel, building spoil, pipeline lengths etc outside of ACTEW lease areas or on parts of lease areas supporting endangered vegetation	Yes	Yes	None and no general lease area management plan to guide workers and contractors	Unnecessary degradation of about 1ha of the Hill, through dumping of material, some of which is the likely source of nodding thistle and Chilean Needle Grass into central areas of the Reserve. Probable destruction of significant plant species.
Pre 1988 - 1995	Cattle Grazing	Yes	No	Up until 1995 grazing was allowed on Red Hill, with little impact monitoring. Conditions limited number of stock, but these were not enforced. No formal assessment was made of the impact of grazing or on community views about their removal	In 1989 the group estimated that cattle droppings alone covered + destroyed 5% of the then population of the endangered Button Wrinklewort. Grazing increased weed abundance and is the probable reason why Red Hill is lacking many orchid, lily and tall daisy species found in similar woodlands not subject to intensive grazing. Since removal of grazing rare plant populations have increased, the area dominated by weeds and overall erosion has substantially reduced and native plant diversity has increased. Some neighbours enjoyed the presence of cows and were sorry when they went. This social impact was somewhat offset by a marked increase of people walking on the Hill, once cows and subsequent thistle patches were removed.
Pre 1988 - 1990	Horse Grazing	Yes	No	Up until 1990 a few horses were allowed to graze a paddock Red Hill, from which cattle were excluded.	Horse grazing occurred in a paddock containing the endangered Button Wrinklewort. It was recognised by Park Staff that the likelihood was high of the horses damaging this population, in addition to other flora. Following their removal there was a marked increase in native vegetation, including the Button Wrinklewort.
1988 -	Urban Services – grass cutting	No	Yes	None – After discussions with	Introduction and spread of Chilean Needlegrass and other weeds

Present	around reserve and along summit road			Red Hill regenerators around 2000, some practices changed – but still a continuing problem	alongside the summit road and the track adjacent to Mugga Way. Weeds pose a significant threat to the Hill. Impact could be reduced by less frequent mowing, better machine hygiene and timing of mowing.
1989	Optus Tower Constructed on Red Hill high point	Yes	-	None	15m tower constructed on end of prominent ridgeline. Tower is prominent and occupies an area of 30m 30m, with a 50m x 5m access track. Much of tower compound and access track are covered by weeds. Tower is the probable source of Chilean Needle Grass invasion into surrounding bushland (which our group has burden of controlling)
1992	Telstra fibre-optic cable. Deakin exchange to Melbourne Ave	Yes	Yes	None	Cable trench runs across reserve and open space woodland for about 2.5km. Construction destroyed 50 plants of the endangered Button Wrinklewort daisy, became a source of weed invasion and left a 3m wide swathe of degraded understorey vegetation for much of its length .
1993	Creation of firetrail by Canberra Nature Park staff	Yes	No	None	A major fire trail was created along the top of the Hill between the Summit and Davidson Trig. This removed the continuity of grassy habitat between the eastern and western sides of the Hill, and probably destroyed some significant plants.
1994	Gas pipeline construction parallel to Hindmarsh Drive	Yes	Yes	Verbal consultation with Nature Park Ranger and Red Hill Regenerators. No written assessment.	For much of its length the pipeline was buried under a service track, but for a few hundred metres at either end it disturbed native understorey, the filled in trench became a source of weed invasion and erosion. Trees are not allowed to regrow above or adjacent to the pipeline.
1995	Planting of Kiosk garden by Urban Services	No	Yes	None	Use of exotic and non-indigenous native species, some of which have spread beyond planting area to become weeds.
1996	Removal of cattle troughs by Canberra Nature Park Staff	Yes	No	None	Cattle troughs were an indication and reminder of grazing history – no assessment of their cultural significance was made prior to their removal. In addition, this has meant the loss

					water sources for wildlife.
1997	Clearance of 30-40 year old regrowth on cut-off drain that rings much of the reserve and prevents 1:100 year rainfall events from flooding down hill houses.	Not at the time – part of the is area is now in reserve	Yes	None – after noticing start of work Red Hill Regenerators (RHR) met with Urban Services + suggested some measures to minimise impact	Removal of hundreds of Red Gum + Yellow Box + wattle small trees and many hundreds, probably thousands of saplings, seedlings and native shrubs from 20m wide drain. Following meeting with RHR, native trees were kept on up-hill side of drain. Work encouraged expansion of weeds, such as umbrella sedge + exotic grasses, and removed many plants of regionally significant species. In addition, broadscale spraying of herbicide was done in close proximity to the major occurrence of the endangered Button Wrinklewort.
1998	Fire suppression operations	Yes	No	None – but emergency operation	Several very large, old and hollow bearing eucalypt trees were cut down unnecessarily in the course of “mop-up” operations. This operations overkill was acknowledged by CNP and we understand operation guidelines changed as a result.
1999	Optus Fibre-optic cable Deakin exchange to Melbourne Ave.	Yes	Yes	No assessment documents. Verbal consultation with Nature Park Ranger and RHR.	Cable is buried under service roads for much of its length, but in places disturbed good quality understorey, and became a source of weed invasion.
2001	Fire suppression operations	Yes	Yes	None - but emergency operation	Introduction of the noxious weed African Lovegrass to the Hill by vehicles involved in fire suppression operations. Raises questions of Vehicle hygiene measures that could be taken.
2002	ACTEW construction of Cyclone fencing around water tanks	Yes	Yes	None	Clearing and disturbance of about 500m x 2m of endangered woodland. Probable destruction of significant plant.
2002	ACTEW repairs to powerlines following boxing day 2001 fire	Yes	Yes	None	Heavy machinery used to replace some poles – works left several 30m x 50m scars still visible today (over 3 years later), disturbed areas site of weed invasions, that required control work by RHR – some regionally significant plants destroyed by work – no rehabilitation – area disturbed was greater than needed to be.
2002	Reduction of	Yes	Yes	Consultation with	The lower slopes of the Hill have the

	fuel load within 50m of houses, by Canberra Nature Park, largely removal of shrubs, saplings and small trees.			RHR and Wildlife + Ecology Unit. Significant plant species where marked and kept, consultation with neighbours over removal of material Clumps of bushes kept to try and retain bird habitat	deeper richer soils and are such are the prime woodland bird habitat. The works reduced the extent of habitat Works created conditions that led to local loss of barbed-wire grass clump which at the time was only known from 2 locations on Red Hill.
2003	ACTEW slashing + cutting of vegetation in the vicinity of powerlines	Yes	Yes	None	Workers drove over main Button Wriklewort population and killed several plants through their disturbance. Level of clearing was excessive and involved many (probably approaching 100) shrubs and small trees that had already reached their full height and where 10m or more away from powerline. Unfortunately those doing the work had little botanical knowledge. Works also aided weed invasion.
2003	Emergency Relief grazing + reduction of fuel load over about 75ha of Reserve – overseen by Canberra Nature Park Staff	Yes	No	Consultation with RHR + Wildlife Ecology Unit. Conditions of grazing, including time limit, specified in written document	Some loss of significant plants (Tick bush + native flax) but difficult to distinguish grazing from drought impact. Conditions and assessment reduced impacts that might have occurred, and without them it may have been difficult to remove cattle as farmer (not actually a person in hardship) exceeded time limit by several weeks. Not a perfect process but at least potential impacts were recognised and impacts mitigated against.
2003	ACTEW repair of leaks from water tanks and connecting pipes	Yes	Yes	None	Disturbed areas 10m x 20m are still bare earth, waste cement dumped in bush and mixers washed so that residue flowed down slope over woodland understorey.
2003	Widening of tracks for firebreaks	Yes	No	None apparent	Grading of existing tracks but also widening of up to 2m. Clump of threatened Swainson's Silky Pea destroyed by works – No Aboriginal sites survey prior to works – no sites are known on Hill – but hill has never been subject to survey and 7 sites were located in adjacent East O'Malley woodland.

2004	Further reduction of fuel load with 50m of houses, by Canberra Nature Park	Yes	Yes	Some consultation with RHR and local ranger, but short time frame made it difficult to provide meaningful input	Almost total removal of shrubs and small trees (probably thousands), no consideration of impact on woodland birds or how works may be mitigated to reduce impact. Monitoring indicates that Red Hill's woodland bird population is suffering a dramatic decline. Shrub that was a known breeding site of the Diamond Firetail (one of the few such sites in the ACT) was removed. A large proportion of Red Hill's hollow bearing trees are within 50m of houses – removing the mid storey has made this area less suitable for Possums and gliders (who live in hollows) and more susceptible to predation. Our main knowledge of sugar gliders on the hill is when neighbours report their cat bringing one home. Removal of shrub layer has encouraged Phalaris growth, which is in itself a fire hazard.
2004	ACTEW?-trenching of pipeline or cable along 1km section of summit road.	Yes	Yes	None	Led to the replacement of native grasses by exotic species adjacent to summit road.
2004	ACTEW Pump-house construction above Kent Street	Yes	Yes	Verbal consultation with RHR and Canberra Nature Park – apparently a letter with conditions for work written by Canberra Nature Park. At request of RHR – Actew provided money for construction of 15 nest boxes and removed woody weeds from nearby creekline	Loss of about 50m x100m of Nature Reserve. Some of which was heavily weed invaded – but all was capable of regeneration to high quality endangered woodland. Vehicles parked on significant understorey leading to its degradation and accessed the site via several new informal tracks (about 250 m x 3m in length) that destroyed significant understorey, increased erosion and created back-entrances to several houses above Kent street. Spoil was also dumped on good quality understorey.
2004	Sale of 3ha of Land, next to Deakin Telephone	No	Yes	No assessment + no consultation	About half of land contained good quality endangered woodland. Commonwealth did not consider whether addition to Red Hill Reserve

	exchange, by Commonwealth to Hindmarsh Group				would have been the best use of public land no longer required for telecommunication purposes. Current zoning limits use of land to Utility Services, but buyer of land has intention of establishing high density private housing for the aged.
2005	Prescribed burn adjacent to Deakin, by Canberra Nature Park Staff	Yes	No	Verbal consultation with RHR. Neighbours informed about burn proposal. Written assessment was requested by RHR but no documents were forthcoming. Original proposal was to burn a very large area, including bush burnt in 2001. The area was reduced by about 2/3 following consultation	Further reduction of prime woodland bird and possum habitat. Death of at least three hollow bearing trees.