

Session 4: A 'State' Agency Case Study in Off-reserve Conservation Grassy Ecosystem Protection and Management in the ACT

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Introduction

In recognition that Natural Temperate Grassland and Yellow Box-Red Gum Grassy Woodland have severely declined and been subject to a significant level of alteration, these ecosystems have been declared endangered ecological communities in the ACT. Natural Temperate Grassland in the Southern Tablelands has been listed as an endangered ecological community under Commonwealth legislation. Additionally, some plant and animal species utilising these habitats have been declared threatened. A list of threatened species that occur in grassy ecosystems in the Southern Tablelands is presented in Table 1.²

The conservation status of threatened species and communities in the ACT is determined in a regional context (ACT Government 1998a). Action Plans have been prepared for all species and ecological communities declared endangered or vulnerable in the ACT. These documents describe the conservation approach taken by the ACT government, and include an outline of the information known and the important conservation issues about a species or community. Requirements for protection, research, surveying, monitoring and management actions that are necessary to enhance the conservation of the species or community are discussed (ACT Government, 1997-1999). Actions required are focussed at the local level, and indirectly at a regional level through liaison and coordination (ACT Government 1998a).

Vision

The vision for threatened ecological communities and species is to preserve these poorly conserved ecosystems and species into the future, recognising their values for conservation and sustainability of our natural, social and economic environment.

The major conservation objective is to maintain threatened ecological communities (Natural Temperate Grassland and Yellow Box-Red Gum Grassy Woodland) as viable and well represented ecological communities in the ACT in perpetuity (ACT Government 1997a, 1999a), and to maintain, in the long term, viable wild populations of [threatened species] as a component of the indigenous biological resources of the ACT and as a contribution to regional and national conservation of the species (ACT Government, 1997b). A further objective is to prevent additional species and ecological communities from becoming threatened (ACT Government 1998a).

Who is responsible for the conservation of these grassy ecosystems?

All landholders have a responsibility towards maintaining the conservation values of land that contains these threatened ecosystems or species. However, responsibility (including financial) includes the community as a whole, and does not just lie with the landholder. Thus, stakeholders include the landholders, community in general, government agencies (Commonwealth and Territory), non-government organisations (including World Wide Fund for Nature, Greening Australia), research and educational organisations.

Protection Mechanisms

A system of protected areas (reserve system) is central to the conservation of biodiversity and natural ecological processes (ACT Government 1998a). An adequate reserve system ensures that security of tenure and formal management objectives for nature conservation are achieved for viable samples of all ecosystems in the ACT. Off-reserve conservation complements and

² Tables and other material referred to in Sarah's paper appear at the end of the proceedings.

supports the reserve system, by providing additional areas containing biodiversity, so as to preserve the landscape as a functional ecological unit (ACT Government 1998a). Through a range of mechanisms, nature conservation is integrated into the management of leased rural land and unleased Territory and Commonwealth land.

The Action Plans define a strategy of integration of the conservation of viable remnants of threatened communities and habitat for threatened species wherever possible within the matrix of other land uses in the ACT, through appropriate planning and sensitive and compatible land-use management (ACT Government 1997a). By encouraging current, or in some cases modified, land uses to continue, the Government acknowledges the abilities and responsibilities of landholders to manage areas of land that have conservation value.

The aim is to try to retain a network of sites that: are *comprehensive* (including the full range of floristic associations and related flora and fauna); provide *adequate* replication of ecologically viable communities, species and populations; and are *representative* of the biological diversity of the ecological community (ACT Government 1998a).

Different methods of protection that are recommended are assessed on the basis of:

- The conservation values of the land;
- Consideration of size, diversity, representativeness, distinctiveness and naturalness;
- Replication within conservation areas;
- Integration of smaller systems within broader conservation systems; and
- Constraints and opportunities provided by present and future land use patterns (ACT Government 1997a).

The Action Plans for Natural Temperate Grassland and Yellow Box - Red Gum Grassy Woodland and associated threatened species recommend that core sites with high conservation values be protected through reservation and Memoranda of Understanding with government landholders. Sites with a moderate conservation value, often being smaller and with lower diversity of native species can be, or are, incorporated into the Urban Open Space system or maintained as Special Purpose Reserves. For rural sites with lower conservation values it may be relevant to apply Land Management Agreements as leases are renewed. Where sites of low value exist in areas that are to be developed, these may be incorporated, where feasible, into the urban infrastructure, as parks or roadsides or other open space. Some sites with low or minimal botanical significance contain populations of threatened species. In these sites the level of protection is determined by the habitat requirements for the threatened species.

Management

Whatever level of protection is provided for individual sites, the key factor for their long-term conservation is the implementation of management practices that will maintain, and ideally enhance, the existing biodiversity values. The application of 'best practice' management is critical for the preservation of these ecosystems and threatened species, and is as significant an issue in retaining conservation values in reserves as in any off-reserve sites.

Remaining grassy ecosystems and the species that occur in them exist today as a direct result of past management, including pre-European Aboriginal land management. Each site is unique in its history of land uses and levels of disturbance. Each site differs in its composition and structure. Sites may have a high conservation value because they contain a high native floristic diversity, they may contain threatened species (but not necessarily a high native floristic diversity), or they may contain a particular group of species that are uncommonly represented in other sites. Consequently, different management approaches are relevant to individual sites.

In the majority of sites the needs of the native species or community (reproduction, shelter and food) have been, in the past, secondary or incidental to other requirements, and the conditions required for their continued survival may only occasionally have been met. In some sites there may be no or few changes that need to be made to current management practices to retain con-

servation values. In other situations a more strategic approach to providing opportunities for reproductive success (of plants or animals) may require modifications such as implementing rotational grazing or deferring mowing or a more targeted approach to weed management.

Manipulation of vegetation biomass is the major way of enhancing biodiversity. Biomass manipulation involves the removal of excess grass growth to create spaces for a diversity of plant species to reproduce, whilst retaining the optimum habitat structure for animal species. It also involves limiting defoliation of native plants during flowering, seed production and seedling establishment phases, and during periods when animal species are susceptible to the lack of shelter and/or food. Grazing, burning and slashing are methods used to control biomass to facilitate conservation outcomes for sites. In some sites no active management may be an appropriate method to retain conservation values.

Biomass manipulation can also be used to control the spread of exotic plants. Grazing, burning and slashing or mowing can be used to reduce seed set of those species. At all times, consideration needs to be given to the likely responses of native species, exotic species and threatened species in particular.

Other significant management requirements include prevention of soil disturbance (which may range from ploughing and re-seeding or overgrazing to expose bare ground), limiting additional fertiliser and the prevention of weed infestation.

Research and monitoring

Applying 'best practice' management is based on implementing actions that are recommended as a result of research. The application of agronomic as well as ecological research is frequently relevant in achieving conservation outcomes. Additionally, much is being learnt by studying the history of particular sites and the dynamics of species within those sites.

Monitoring of the condition of sites and species may be undertaken in many ways. The methods of monitoring that may be carried out depend on the objectives and required outcomes, and the level of expertise and available resources. Methods range from checking that a species (or ecological community) is still appropriately represented, determining whether intended actions have been undertaken (which may not necessarily assess what the actions have achieved), making photographic records over time, through to detailed repeated surveys and analysis of change over time.

Whilst monitoring is an extremely important tool in reviewing the results of actions, the methods applied may be of little benefit if the assessor does not have the skills, time or resources to interpret the information adequately. It is recommended that before more detailed monitoring is undertaken (for example repeated surveys over time) advice is sought as to what methods of monitoring provide useful information in the particular circumstances.

Monitoring is currently being undertaken in the ACT at grassland sites that are subject to a range of land uses and protection levels (rural leases, sites subject to MOUs, urban sites and reserves). Vegetation monitoring commenced in 1993, and is being used to compare the outcomes of different management regimes within and between sites. Monitoring of the presence and abundance of several threatened species (including Golden Sun Moth, Striped Legless Lizard, Grassland Earless Dragon) is also occurring. The presence of other species within sites may be detected as part of these monitoring programs.

Developing management plans for sites containing grassy ecosystems

Management Plans for sites need to relate specifically to what is contained in those sites, what the issues are, what the land is used for, and what the long-term goals are. Importantly, there needs to be some form of assessment of the outcomes of the management that is applied, to de-

termine whether the objectives are being achieved. A structure for the development and implementation of a management plan includes the following:

- Description of the site and identification of conservation values and issues at the site (what conservation values are present, weeds on the site, disturbance levels, past history, timing of management actions required to reduce impact on threatened species, other values or problems);
- Identification of objectives and outcomes (conservation, economic and social, where relevant; what site attributes are wanted, what needs to be removed/retained);
- Preparation of a map of the site with assets (eg fencing, watering points);
- Identification of actions required to achieve the objectives and who will be involved;
- Implementation of actions; the management applied needs to be flexible enough to allow for some change if required, or to take into account modified conditions (such as wildfire, or invasion of a particular weed);
- Recording outcomes of actions (using a range of methods: monitoring, photographs, records of events and issues and follow-up actions); and
- Review and revision of actions and outcomes. The recording of outcomes provides a continuous form of checking to ascertain that the program remains on target, and the records (photographs etc) provide the ongoing tools for review. A review after a year will provide a check to see that the actions and timing outlined are realistic, and a more formal review after several years will provide preliminary results that can be used to ascertain whether the objectives and outcomes are being met.

Case Studies

Introduction

Case studies of conservation management/implementation plans for two grassland sites in the ACT are presented. The case study for the first site, Campbell Park Offices, presents a strategy that, given the issues that occur at the site, could potentially be applied. A program that addresses these issues will be implemented when Department of Defence prepares the Environmental Management Plan for the wider landscape of the Campbell Park Offices. For simplification, while the site is contiguous with another area of grassland and woodland, only the section that is managed by Department of Defence is included in this case study. The second site is a conservation reserve, which is larger with multiple paddocks and is managed using stock grazing.

Case Study 1: Campbell Park Offices

Description and identification of conservation values and issues

The Natural Temperate Grassland at Campbell Park occurs to the south-east of Northcott Drive, which is adjacent to Mt Ainslie Nature Reserve. To the east and south of the site is another area of grassland and grassy woodland (Figure 1). The site contains about four hectares of Natural Temperate Grassland and habitat for the threatened Button Wrinklewort (*Rutidosis leptorrhynchoides*), Grassland Earless Dragon (*Tympanocryptis pinguicolla*), Golden Sun Moth (*Synemon plana*) and Perunga Grasshopper (*Perunga ochracea*). All these species, and an additional species, Striped Legless Lizard (*Delma impar*), occur in the adjacent paddocks.

Spear Grasses (*Austrostipa* species) and Wallaby Grasses (*Austrodanthonia* species) dominate the site. The structure is relatively open and the native floristic diversity is moderately high. There is a resident population of kangaroos.

Several weeds of concern occur on the site, including scattered Serrated Tussock (*Nassella trichotoma*) and St Johns Wort (*Hypericum perforatum*). An adjoining earth and mulch dump may be contributing to the weed problem.

The site has been managed by mowing since the development of the nearby Department of Defence offices. Responsibility for the management and conservation of the site lies with Department of Defence, who have a Memorandum of Understanding with Environment ACT to retain conservation values on the site.

Objectives for conservation outcomes

- To maximise habitat for the threatened species.
- To maintain the Natural Temperate Grassland ecological community.
- To maximise native floristic and habitat diversity.
- To protect the adjacent areas from wildfire.
- To control herbaceous and woody weeds.
- To maintain the landscape integrity of the site.

Map of the site

A map of the site is presented in Figure 1.

Specific issues

The specific actions that need to be addressed in the reserve, and the actions required to manage the issues are presented in Table 2.

Implementation of Actions

The actions, identified by season are presented in Table 3.

Recording outcomes of actions

Monitoring of the threatened species and landscape condition is being undertaken to determine long-term effects of management actions. A photographic record is also maintained.

Review and revision of actions and outcomes

Not yet undertaken. An annual review in spring 2000 indicated that the weed problem has not yet been controlled. The mowing program is satisfactory.

Case Study 2: Crace Grassland Reserve

Description and identification of conservation values and issues

The Crace Nature Reserve in Gungahlin borders the Barton Highway. It is part of a network of grassland reserves in Gungahlin, which together total 540 hectares and were established to protect 175.2 hectares of Natural Temperate Grassland and habitat for the threatened Striped Legless Lizard. Subsequent surveys uncovered populations of three other threatened species (Golden Sun Moth, Perunga Grasshopper and Button Wrinklewort). A small woodland (several hectares in size) occurs on one hill, a small outcrop of trees remains on another hill, which is likely to have been extensively cleared in the past, and there are several plantations of eucalypts and native shrubs (Figure 2).

Spear Grasses and Wallaby Grasses and extensive areas of Phalaris (*Phalaris aquatica*) in the low-lying areas of the site dominate the reserve. Roads, with the exception of a small area adjoining leases in Mitchell, define the perimeter of Crace Nature Reserve.

Several weeds of concern occur on the site. Chilean Needle Grass (*Nassella neesiana*) is relatively extensive and scattered Serrated Tussock occurs on site.

Recently saline soils have been detected in a naturally poorly drained area. Drainage onto the site from the Barton Highway and from paddocks across the road, and impeded drainage off the site are likely to have exacerbated the problem.

Crace Nature Reserve has a long history of continuous grazing. The Department of Defence has used about one-third of the site as a RAAF communications base. RAAF no longer use the base and have removed the radio towers. RAAF fencing and other infrastructure remain, but are in poor condition. Fencing prior to reservation divided the site into two main paddocks, with several very small paddocks created to protect tree plantations (Figure 2).

In order to assist conservation management several new fences have been erected. One small area is dominated by Chilean Needle Grass, and has been fenced to enable intensive strategic grazing to reduce the population. The other area that has been fenced has separated off the more native area from the low-lying area that is dominated by *Phalaris* (Figure 2).

Responsibility for the management and conservation of the site lies with ACT Parks and Conservation Service (PCS). The Management Plan was developed cooperatively with PCS Rangers with extensive management experience and officers from Wildlife Research and Monitoring with conservation experience, to ensure that the management that was implemented would achieve conservation outcomes. Several of the officers involved have undertaken a Prograze course run by NSW Agriculture, and many of those principles are applied in assessing biomass and ensuring sustainable grazing practices are utilised.

Objectives for conservation outcomes

- To maximise habitat for the Striped Legless Lizard, Button Wrinklewort and Golden Sun Moth.
- To maintain the Natural Temperate Grassland ecological community.
- To maximise native floristic and habitat diversity.
- To protect the reserve from catastrophic burns.
- To investigate possible salinity outbreak.
- To gain incorporation of RAAF land into the reserve.

Map of site with assets

The site has now been divided into five paddocks for management purposes and several small paddocks where fencing to retain the plantations have been retained. All watering points, gates, fencing and other infrastructure have been mapped (Figure 1).

Specific issues

Specific issues that need to be addressed in the reserve, and the actions required to manage the issues are summarised in Table 4.

Implementation of Actions

Actions have been identified paddock by paddock, and season by season to identify what is required to manage the site to meet objectives (Table 5). Grazing is rotated through the paddocks to reflect grass production, regeneration opportunities for native plants, critical periods for threatened fauna and control of weeds. Grazing levels are determined on a biomass basis, based on by-eye estimations (a skill developed through attending Prograze courses).

The saline area is being monitored to create an understanding of the level of the problem. Weeds are being controlled, with particular emphasis on control of Chilean Needle Grass and Serrated Tussock.

Recording outcomes of actions

As the actions are achieved, and to record other issues, a running sheet of events is maintained (Table 6). Additionally, monitoring of the vegetation, threatened species and landscape condition is undertaken to determine long-term effects of management actions. A photographic record is also maintained. These records enable periodic review of the results, with revision applied as required to achieve 'best management' practices.

Review and revision of actions and outcomes

The site is visited regularly to determine the condition of the site. The program appears to be workable, but has not yet been under way long enough to ascertain its effects.

A toolkit for the development and implementation of management plans

Recognising the potential difficulties that landholders may have in developing management plans that include conservation issues, a management kit is currently being developed by other colleagues and myself. The kit will provide an opportunity to integrate conservation management as part of a range of ongoing land uses, where conservation is not the only objective and will enable the landholder to seek solutions that suit their individual enterprises. The kit will address conservation of native vegetation, faunal habitat and landscape function and condition. The decision making process provided by this kit will have applicability for a range of land management issues including biodiversity conservation, weed management strategies and soil and water issues. The kit will include:

- Description of different types of grassy ecosystems including the endangered ecological communities (Natural Temperate Grasslands, Yellow Box-Red Gum Grassy Woodland and White Box Woodland), native pasture, secondary or derived grasslands, and other grassy woodlands to enable their identification and establish their relative conservation values;
- Information on the management of the ecology and landscape function of these systems (using resources already to hand through recent publications, existing toolkits and research results);
- How to define objectives and required outcomes;
- How to identify issues and related actions and how to implement them;
- Description of methods on how to survey sites and monitor what is happening: details of a range of methods and how to review and apply the results;
- Description of methods that can improve the conservation values, eg revegetation, weed management;
- Presentation of case studies outlining implementation of the kit's decision strategy on several sites; and
- A list of references and people to locate where landholders can go to get help.

The format will be such that landholders with no scientific training will be able to develop and implement management plans on individual sites, assess the results and modify management practices if required, while providing a resource that identifies how they can get additional help. The kit will not be prescriptive, but will encourage an adaptive approach.

Conclusions

Conservation of threatened ecological communities is the responsibility of all members of society. Since early settlement the land containing grassy ecosystems has been recognised for its values for rural production, and for development of housing and infrastructure because of the flat or gently rolling terrain, open structure and dominance by grasses. It is because of this that

we have few left in relatively 'natural' condition. However, many sites have been managed in such a way that conservation values have been retained, where these values also fulfil other objectives, including rural production and maintenance of landscape integrity. There is ever increasing information available regarding the economic and social advantages in retaining grassy ecosystems, including the part they play in enabling sustainable production, the utilisation of native grass seed for landscaping and farming and the prevention of salinity.

It has only been a few years since there was even any awareness that these ecosystems had any conservation values, especially those areas without any trees. Now many people are recognising the range of values that grassy ecosystems have, and are working towards retaining what is left. It is only through the interest and dedication displayed by a wide range of people (with sometimes very different objectives) that these severely fragmented and degraded ecosystems with their unique biodiversity will be retained into the future.

There is a need to protect what is left, not by locking up and throwing away the key, nor by walking away and leaving the responsibility to government agencies, but by working together. We have much to learn in order to know best how we can conserve these ecosystems. In the meantime, there are many ways that individuals can be, and are, involved.

References

- ACT Government, 1997a. *Natural Temperate Grassland - an endangered ecological community. Action Plan No. 1.* Environment ACT, Canberra.
- ACT Government, 1997b. *Striped Legless Lizard (Delma impar) - a vulnerable species. Action Plan No. 2.* Environment ACT, Canberra.
- ACT Government, 1997c. *Eastern Lined Earless Dragon (Tympanocryptis lineata pinguicolla) - an endangered species. Action Plan No. 3.* Environment ACT, Canberra.
- ACT Government, 1997d. *A leek orchid (Prasophyllum petilum) - an endangered species. Action Plan No. 4.* Environment ACT, Canberra.
- ACT Government, 1998a. *Golden Sun Moth (Synemon plana) - an endangered species. Action Plan No. 7.* Environment ACT, Canberra.
- ACT Government, 1998a. *ACT Nature Conservation Strategy. ACT Parks and Conservation Service Conservation Series No. 15.* Environment ACT, Canberra.
- ACT Government, 1998b. *Button Wrinklewort (Rutidosia leptorrhynchoides) - an endangered species. Action Plan No. 8.* Environment ACT, Canberra.
- ACT Government, 1998c. *Small Purple Pea (Swainsona recta) - an endangered species. Action Plan No. 9.* Environment ACT, Canberra.
- ACT Government, 1999a. *Yellow Box - Red Gum Grassy Woodland - an endangered ecological community. Action Plan No. 10.* Environment ACT, Canberra.
- ACT Government, 1999b. *Hooded Robin (Melanodryas cucullata) - a vulnerable species. Action Plan No. 15.* Environment ACT, Canberra.
- ACT Government, 1999c. *Swift Parrot (Lathamus discolor) - a vulnerable species. Action Plan No. 16.* Environment ACT, Canberra.
- ACT Government, 1999d. *Superb Parrot (Polytelis swainsonii) - a vulnerable species. Action Plan No. 17.* Environment ACT, Canberra.
- ACT Government, 1999e. *Brown Treecreeper (Climacteris picumnus) - a vulnerable species. Action Plan No. 18.* Environment ACT, Canberra.
- ACT Government, 1999f. *Painted Honeyeater (Grantiella picta) - a vulnerable species. Action Plan No. 19.* Environment ACT, Canberra.
- ACT Government, 1999g. *Regent Honeyeater (Xanthomyza phrygia) - an endangered species. Action Plan No. 20.* Environment ACT, Canberra.
- ACT Government, 1999h. *Perunga Grasshopper (Perunga ochracea) - a vulnerable species. Action Plan No. 21.* Environment ACT, Canberra.