Biodiversity Management Plan

Version no. 1 | August 2011

EXECUTIVE SUMMARY

The Biodiversity Management Advisory Committee met between June and July 2011 to design and develop a planning document that would guide:

- the identification of biodiversity land on Charles Sturt University (CSU) properties and
- the management and resourcing that would be required to manage this land

To develop this document, the makeup of the committee was designed to ensure that a broad range of views on biodiversity management was considered. The committee consisted of two academic staff with backgrounds in environmental science and natural resources management, two CSU Groundskeepers with backgrounds in horticulture and one CSU Green representative as committee facilitator.

The outcome of these committee discussions was the development of this framework document.

The Biodiversity Management Plan makes a number of key recommendations as to how CSU can start working towards its Biodiversity target. These include:

- establishing baseline data as to the current state of biodiversity on each campus (utilising the Biometric assessment methodology)

- using this and other relevant data to nominate biodiversity areas which could be allocated to the biodiversity target

- Preparing a campus-specific biodiversity management plan, outlining the resources that will be required to improve the biometric score of each biodiversity area over the next five years.

- To engage the community and stakeholders in the importance of biodiversity by erecting interpretive biodiversity signs, conducting guided walks, and providing stakeholder participatory opportunities for landscape scale connectivity discussions by 2015.

- Engage a consultant to perform follow-up biometric assessments on all campuses every five years to assess improvements in identified biodiversity areas.

The methodology and key recommendations that have been presented in this document, will allow CSU to achieve its 2014 biodiversity target in a way that provides high-quality biodiversity outcomes for the environment at a moderate cost to the organisation.

TABLE OF CONTENTS

1. Introduction

AIMS

The purpose of this document is to provide a high-level implementation plan for the achievement of CSU's stated biodiversity targets by:

- Identifying a process that will allow CSU Green, working in collaboration with relevant stakeholders on each campus to:

    o Locate all un-developed areas
    o Determine which areas should be allocated to the biodiversity target

- Identifying an assessment process through which the ecological value of biodiversity areas can be assessed
- Identifying an adaptive management processes that can be implemented to improve health and value of biodiversity assets
- Identify resourcing requirements for ongoing management

CURRENT TARGET

The biodiversity target included in the previous Institutional Development Plan's (2007-2011) states that Charles Sturt University will:

- Allocate 10% of campus area to increasing biodiversity by 2011.
- Allocate 20% of campus area to increasing biodiversity by 2015

The new University Sustainability Enabling Plan (2011-2015)[1] reiterates the above targets as well as establishing an additional target beyond 2015 for continuous improvement in the health and quality of all allocated biodiversity areas.

The Strategic Biodiversity Management Position Paper (Jul 2010) provided some further definition to this target and identified that approximately **87ha** of land spread across all the major CSU campuses will need to be allocated to biodiversity by 2015 if the University is to achieve its 2015 target.

2. Identify biodiversity assets

An initial, logical step in progressing CSU's Biodiversity target requires the establishment of an understanding of all undeveloped CSU land that is potentially available for consideration for inclusion in the Biodiversity target (eg not ear-marked for future development in campus masterplans, not land of prime agricultural value to CSU Farm activities, not subject to an Asset Protection or other bushfire management zones).

---

[1] In draft format at the time of writing this document

RESOURCES REQUIRED:

- Input from Facilities Management and Farm Management staff to assist in defining available biodiversity zones
- CSU Green resources to facilitate workshops and develop campus maps showing areas potentially available for inclusion in Biodiversity Target

DELIVERABLES:

- Maps of each of the major campuses showing all areas that are available for potential inclusion in biodiversity target.

3. Assess biodiversity assets

An important consideration when establishing areas for inclusion in the Biodiversity Target, recommended in the Biodiversity Position Paper and reiterated by the Biodiversity Management Advisory Committee, is the protection of existing land that retains higher levels or biodiversity value. This requires an assessment of each of the major CSU campuses to occur.

Existing biodiversity assessments currently exist for some campuses (Albury Wodonga and Wagga Wagga). Provided these are no more than five years old, these should still be used to identify the biodiversity quality allocated land. Additional biodiversity assessments will need to be completed for campuses that have not previously been assessed. It is recommended that this is completed by an external consultant who is familiar with the local biodiversity.

Baseline ecological data collected before development, in the form of flora and fauna surveys and photo-point data will be collected to analyse the effects of management actions and identify future project outcomes. Land-use history will have created different threats for individual campuses and micro-sites. The effects of grazing, weeds, edge effects, pests, land-use histories and neighbouring activities will be different for each site. Overcoming these threats and providing some level of connectivity in the landscape are key aims in ecological restoration projects.

RESOURCES REQUIRED:

- Funding for biodiversity assessments to be completed by a third-party at campuses that have not previously been assessed (estimated at approximately $50,000)

DELIVERABLES:

- Biodiversity assessment of all nominated biodiversity areas is completed
- Biodiversity maps are updated for each campus to show the ecological value of these areas

4. Establish Biodiversity Target Boundaries

Once potential land available for inclusion in the Biodiversity Target and biodiversity value has been assessed, as outlined in Sections 2 and 3, CSU will be well-informed to define land for inclusion in the Biodiversity Target. Local Environment Plans; Development Control Plans will also need to be overlayed at this point to ensure that their requirements are also satisfied.

It is recommended that a consultative process, facilitated by CSU Green and involving Campus Environmental Committees on each of the major campuses occurs

Using the Campus Environmental Committees has the advantage of having a senior campus management representative as a participant in the decision-making process and ensures that (for the most part) all major stakeholders are represented. However, in some instance, additional consultation will be required (e.g. Senior DFM Management, Farm Management Committees etc.).

RESOURCES REQUIRED:

- Extended CEC sessions at each campus to identify areas for allocating to the biodiversity target
- SPAN input to prepare biodiversity maps showing areas that could potentially be allocated to the biodiversity target. Total sum of area across all campuses to be greater than or equal to **87ha** as recommended in the Biodiversity Position Paper.

DELIVERABLES:
- Biodiversity maps for major campuses showing areas allocated to Biodiversity Target

5. Managing Biodiversity Assets

Once Biodiversity Target Boundaries have been established, CSU Green should have all the information available to be able to prepare a campus-specific Biodiversity Management Plan. The intent of this plan will be to identify and quantify:

- What actions will be required to manage the identified biodiversity areas
- What resources will be required to manage the identified biodiversity areas

Rather than produce one whole of CSU plan, it is preferable to create individual campus documents which:

- Identify local Noxious weeds, pests and diseases;
- Consider local environmental, climatic, and planning conditions;
- Utilises the local knowledge-base; and
- References to site-specific flora and fauna

The following section is to provide some guidance as to how identified biodiversity areas should be managed, and what resources would potentially be required to achieve

HIGH TO MEDIUM VALUE BIODIVERSITY AREAS

The major threats to biodiversity are clearing, weed invasion and over-grazing (Spooner, 2010). Once high priority areas have been determined it is necessary to protect these from development, inappropriate management actions and / or neglect. Key steps include:

- Protecting habitat from development;
- Conducting strategic grazing; or, continuous grazing at <4 DSE/ha;
- Managing weeds and pests.

Weed Removal

Weed removal is a fundamental component of biodiversity management. Invasive introduced plants are one of many complexities that have the potential to change woodland bird assemblages and threaten biodiversity (Watson, 2011).

For example, recurring noxious weeds on site at Wagga Wagga campus are *Lycium ferocissimum* (African Boxthorn) and *Ailanthus altissima* (Tree of Heaven*). Olea europaea* subspecies *cuspidate* (African Olive) is a Class 4, locally controlled, or environmental weed elsewhere in the state with potential to become listed. Understory pasture weeds of note on site are *Hypericum perforatum* (St.John's Wort) and *Marrubium vulgare* (Horehound). All of these weeds are recurring and difficult to control due to the terrain of the area and difficulties of safe access (S. Cole personal communication, June 22, 2011).

Current quoted prices for contractors to weed spray on site using 1,000 litre tanks of herbicide spray and a 200m remote operated retractable reel are between $90-95 / hour (P. Walpole, personal communication, June 29, 2011). Active weed management may be necessary over several months (S. Cole, personal communication, June 22, 2011). Management actions for the removal of these plants will need to be persistent due to the nature of these weeds.

Strategic Grazing

Grazing management may be possible on multiple-use sites and where bush-fire risk is high. Native species diversity may improve where grazing is conducted at low stocking rates (Dorrough, Stol, & McIntyre, 2008). Strategic grazing can be beneficial where managers are able to monitor the effects of grazing on pasture composition and track changes. An example may be to monitor particular species that are intolerant of grazing and create explicit management actions which state: "better recruitment of *Themeda* sp., *Poa* sp. and *Dichelachne* sp." (M. Crane, personal communication, May 12, 2011). In this example stock may have to be removed whilst these targeted plants are flowering and

setting seed. Diversity of native species may be maintained or improved with continuous grazing if stock are kept at a density of <4 DSE/ha (Dorrough, et al., 2008).

A calendar of grazing times could be developed for the campuses where strategic grazing is identified as a viable biodiversity management option (i.e. those campuses with attached farm land)

Access Restrictions

It is the suggestion of the steering committee that, where feasible, access paths for walkers & cyclists be established. The establishment of biodiversity areas on all major Charles Sturt University campuses should be seen as an opportunity to provide staff, students and visitors with a number of attractive green spaces.

In addition to this, the use of interpretative signage along in these areas will give CSU Green the opportunity to engage with the wider public regrading the benefits of preserving and enhancing the local biodiversity.

While access to these biodiversity areas should be encouraged, the security of staff, students and the general public will need to be maintained in these areas at night. It is suggested that this could best be achieved by:

- Placing signage discouraging travel through these areas at night
- Placing street lighting at access points
- Security staff to monitor areas as part of regular patrols

It is important that CSU Green continue to engage with both the University and wider community as to the importance of biodiversity. Other suggestions to acheive this includes:

- Conducting guided walks (scheduled in CSU calendar of events) – marked walking trails / lookouts should be considered to promote CSU's biodiversity assets
- discussions with stakeholders discussing additional opportunities for biodiversity connectivity within and external to the campus

LOWER VALUE BIODIVERSITY AREAS

Passive restoration would be the least costly option as this would entail weed and pest removal and rely on natural regeneration of the remaining native vegetation. This is possible where native species are relatively diverse; site assessments will determine species diversity prior to beginning biodiversity management actions. Weed and pest removal are likely to be intensive in the initial stages and may decline with time.

Where native plant diversity is lacking in lower quality vegetation zones, plants may need to be re-introduced to an area. Plant species that are characteristic of the White Box - Yellow Box - Blakely's Red Gum Woodland EEC may be used in future revegetation projects (Appendix 2). Direct seeding has been noted as a cost effective planting measure. Martin Driver is the Murray CMAs Catchment Officer Revegetation, and is a potential contact for seed collection and direct seeding contractor based in Deniliquin (S. Niedra, personal communication, May 25, 2011). Alternatively Greening Australia may be able to assist with this process.

CSU Green will also continue to actively pursue co-funding of revegetation opportunities. Examples of these that have been successfully implemented include the Climate Change Corridors initiative with the local Catchment Management Authority and the Community Action Grants that are administered by the Federal Government.

It is recognised that many lower value biodiversity areas are located close to core campus areas and are highly visible to CSU students and staff, Annual Tree Planting Days have demonstrated to be a highly successful means of stakeholder engagement and it is recommended that this continue.

RESOURCES REQUIRED:

- CSU Green time to develop campus-specific and fully-costed management plans
- Time of campus operations staff to aid in developing the management costs
- Contract labour to undertake active weed management
- Consultation with CSU Farm and Faculty of Science staff to establish agreed grazing routines
- Signage steering committee to consider interpretive signage designs and approve signage package for biodiversity areas

DELIVERABLES:

- Campus-specific Biodiversity management plan covering the resources required, timing of tasks to be completed and estimated ongoing costs
- Interpretive signage delivered and placed on all campuses
- Updated campus master plans to identify potential 'biodiversity walks' on each campus
- Updated calendar of events to include guided biodiversity walks on each major campus

6. Continuous Assessment of Biodiversity Assets

Efforts to restore habitat in fragmented or modified landscapes do not guarantee that biodiversity will be increased. The success of the project is not measured by the amount of trees planted or area fenced; but by comparisons made against reference areas, or baseline data.

As per the goal outlined in the 2011-2015 Sustainability Enabling Plan the quality of biodiversity areas should improve each year. It is recommended that a biometric assessment be completed every five years (or until the end of the next University strategy period) to achieve this target.

This will have the added benefit of ensuring that CSU resources that are being allocated to the identified biodiversity areas are producing a significant improvement every year. Results of these biodiversity assessments can then be reported annually by CSU Green in the CSU Environmental Scorecard.

In years where no follow-up biodiversity assessment is scheduled, the Scorecard will report on the biodiversity activities that were undertaken on each campus (i.e. those activities highlighting in the campus-specific biodiversity plans)

RESOURCES REQUIRED:

- Consultants engaged to complete a Biometric assessment of each major campus every five years and report back on improvements to biodiversity.
- Campus master-planning teams to discuss possibility of including 'biodiversity walks' in campus master plans.

DELIVERABLES:

- Follow-up Biometric assessment of each campus

RECOMMENDATIONS

1. Consulting with relevant campus stakeholders, identify biodiversity areas on each campus,

2. Assess current biological health and diversity of species on campus through a comprehensive biometric assessment on each campus (some ecological assessments already exist for Albury-Wodonga and Wagga)

3. Prepare a fully-costed, campus-specific biodiversity management plan, outlining the resources that will be required to improve the biometric score of each biodiversity area over the next five years.

4. To engage the community and stakeholders in the importance of biodiversity by erecting interpretive biodiversity signs, conducting guided walks, and providing stakeholder participatory opportunities for landscape scale connectivity discussions by 2015.

5. Engage a consultant to perform biometric assessments on all campuses every five years to assess improvements in identified biodiversity areas.

Contributing authors

Pheona R Anderson, Chris O'Connor & Edward Maher

References

- Commonwealth of Australia. (2010). Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia *Biodiversity: Species Profile and Threats Database (SPRAT)* Retrieved 10 July, 2011, from http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=86#listing_advice_loop

- Commonwealth of Australia. (2011). White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands. *EPBC Act Policy Statements* Retrieved 10 July, 2011, from http://www.environment.gov.au/epbc/publications/box-gum.html

- Craig, D. J., Craig, J. E., Abella, S. R., & Vanier, C. H. (2010). Factors affecting exotic annual plant cover and richness along roadsides in the eastern Mojave Desert, USA. *Journal of Arid Environments, 74*(6), 702-707. doi: 10.1016/j.jaridenv.2009.10.012

- Davidson, I. (2009). Charles Sturt University Thurgoona Campus: Biodiversity Conservation Management Plan. Albury: Charles Sturt University.

- Dorrough, J., Stol, J., & McIntyre, S. (2008). *Biodiversity in the paddock: a land managers guide*. Canberra: Future Farm Industries CRC.

- Ehrenfeld, J. G. (2000). Defining the limits of restoration: The need for realistic goals. *Restoration Ecology, 8*(1), 2-9.

- Hobbs, R. J. (2002). The ecological context: A landscape perspective. In M. R. Perrow & A. J. Davy (Eds.), *Handbook of ecological restoration* (pp. 24-45). Cambridge Cambridge University Press.

- NGH Environmental. (2008). Draft Report: CSU flora and fauna investigations. Wagga Wagga: NGH Environmental.

- NSW Department of Environment, C. C. a. W. (2011). Altas of NSW wildlife: Flora and fauna threatened species. Retrieved 29 May, 2011, from http://www.environment.nsw.gov.au/wildlifeatlas/about.htm

- Sharp, S., & Gould, L. (2010). *ACT vegetation monitoring manual: a step-by-step guide to monitoring native vegetation in the ACT*. Jamison, ACT: Greening Australia

- Spooner, P. (2010). Lecture 8: Restoring agricultural landscapes. *Restoration Ecology [PowerPoint slides]*. Retrieved from Charles Sturt University Interact site website: http://interact.csu.edu.au/portal/site/BIO521_201060_A_I

- Thwaites, R. (1993). *Sustainability: our future in the balance. Actions for Albury Wodonga, summary and recommendations*. Albury: Albury Wodonga Region Planning Commitee.

- Watson, D. M. (2011). A productivity-based explanation for woodland bird declines: poorer soils yield less food. *Emu, 111*, 10-18.

Appendices