Management Plan for the Trees of the ANU

Features of the ANU treescape

The most obvious and valuable landscape feature of the ANU campus is its vast and diverse treescape. There are approximately 10,600 trees on the campus and they can be divided into 3 categories:

Original trees which pre-date white settlement

These trees are the remnants of the savannah woodland which was a feature of the higher ground on the site, particularly Acton Ridge. (It is interesting to note that the bulk of the site was grassland.) The original trees include five species, *Eucalyptus melliodora* (Yellow Box), *Eucalyptus blakelyi* (Blakely's Red Gum), *Eucalyptus bridgesiana* (Apple Box), *Eucalyptus mannifera* (Britle Gum) and *Eucalyptus rubida* (Candle Bark)

On the basis of heritage significance the remaining original trees are the most important trees to conserve and protect on the campus. They are also the 'bones' which support the landscape structure of the campus. However, they are also not the easiest of trees to manage safely in a populated environment due to their habit of occasionally shedding limbs (despite the most intensive arboricultural management). They are also particularly prone to accelerated senescence being caused by root disturbance in the form of trenching within the root zone or soil compaction.

The public risk factor associated with these original trees may be minimised by regular inspections to monitor the health of the trees, restricting public activity under the canopy of the trees and enforcing a policy of no development or disturbance in the root zone of the trees.

Native and exotic trees planted after white settlement in the pastoral phase and then the Federal phase of the site

Prior to the ANU being established significant tree planting had occurred on some parts of site particularly in the areas in proximity to the old hospital buildings. In the 1920's Thomas Weston was responsible for planting a wide selection of trees to trial their performance for future use. The selection included Australian native species from various origins, exotic deciduous trees and exotic coniferous trees. From a heritage perspective these trees also rate highly and are important to preserve and protect.

Native and exotic trees planted after the ANU was established in 1949

Extensive planting programs have proceeded since 1949 in association with the development of the campus. Various tree themes have evolved within the campus with areas of predominantly Australian native species, others with mainly exotic deciduous trees or conifers and some with mixed planting. Perhaps the most enduring philosophy for the planting theme for the campus is based on an image of the native landscape of Black Mountain sweeping over the campus being interspersed with pockets and avenues of exotic species.

The planting programs have not been executed with any special regard to potential building development. The attitude in the past was to plant extensively and never mind if trees had to be removed subsequently for buildings. Also, no special care was taken to position trees where they would have the least impact on underground services or pavements. This rather random approach to planting has its merits but the budget constraints of the 1990's have led to the evolution of a far more exact approach to what is planted where.

The aim of managing the ANU treescape

The aim of managing the ANU treescape is to conserve and maintain the trees on the campus to maximise their aesthetic and amenity values and minimise their risk to public safety and damage to the infrastructure of the campus. Replacement and new plantings with appropriate species selection to ensure an ongoing treescape, is an important component of the tree management plan.

There are three basic pre-requisites in achieving this aim. Firstly, to employ staff who possesses the appropriate knowledge, skills and experience in tree management and arboriculture and secondly, to ensure that achieving the aim is given high priority as part of their duties. The third pre-requisite is to allocate an appropriate amount of funding to be reserved for tree management.

The staff and structure of the F&S Grounds Section satisfy the three pre-requisites described above. A dedicated University Arborist position and a Deputy Arborist position has been established to monitor the health and condition of all the trees and program all tree surgery work.

In addition, within the Grounds Section several staff are formerly qualified in the field of horticulture and have practical skills and experience in the operation of chainsaws which facilitates basic arboricultural activities.

Currently F&S allocates 20% of the total annual grounds maintenance budget to tree surgery operations. This figure does not include salaries and additional funds are allocated to the replacement of trees.

Description of the current strategy for managing the ANU treescape

Inspections

Regular inspections of all significant trees are performed to ensure the ongoing health and preservation of the tree and the safety of the public. Particular attention is given to trees that are identified as hazardous or have been known to be problematic in the past. The inspection generates a list of work that is illustrated on a site plan. The type of work falls into one or more of the following categories;

- Deadwood removal
- Removal of poorly formed or defective branches
- Crown thinning/weight reduction
- Formative pruning
- Lifting to enable pedestrian or vehicle access
- Asset clearance
- Removal of broken hung up branches
- Power line clearance
- Cable bracing
- Chemical treatment/soil injection
- Aerial inspection
- Tree removal

During the process of carrying out tree surgery operations the opportunity to undertake an upper canopy inspection is exploited. This inspection often generates more work to a tree and is usually undertaken while the Arborist is up in the tree. The exception is when advanced wood rot is discovered and a tree must be removed completely on safety grounds, in which case the University Arborist is first notified.

Work Scheduling

Once the site inspection is complete the University Arborist schedules the work in order of priority. To avoid disturbance to staff and students much of the work is scheduled on the weekends. Although the bulk of the tree surgery operations on the campus are carried out by qualified contractors, the Grounds Section also carries out a range of tree surgery operations. The Arborist and Deputy Arborist regularly perform small to medium sized tree work mostly branch failures, broken hung up branches, canopy lifting, asset clearance, formative pruning and small tree removal. The true value of having this capability is reinforced during emergency situations when contractors are not immediately available and also deals with the smaller jobs that would be costly to have a contractor perform. The Deputy Arborist also works with the other gardeners performing large hedge and other pruning work.

Naturally any work associated with reducing public risk is scheduled first. In situations where work considered urgent cannot be carried out immediately the area concerned is barricaded off from public use and warning signs erected.

Reporting

The majority of arboricultural work is generated through inspections but is also generated through reports via the following channels;

- OH&S Hazard or near miss reports – usually eye hazards or line of sight problems
- Building maintenance workers – Branches overhanging gutters or plant rooms or
- access issues around buildings
- Electricity Authority – clearing of overhead powerlines.
- Community members – report hazards high in the tree canopy which may only be seen from a window of a multi-story building.
- Security – after hours and emergency
- Work can be logged through Maximo or by email gardens.grounds@anu.edu.au

Phone 61258969 or 0416249704 for emergencies

Hazard reduction

Formative pruning is a valuable technique used to reduce the incidence of structural defects. This technique aims to prune early and in accordance with the natural form of an individual tree. The principles behind this technique include:

- Removal of poorly developed or diseased branches.
- Removal of multi stemmed leaders.
- Removal of crossing branches
- Removal of branches where included bark is evident at the crotch or where the branch intersection forms an acute angle.

Often young and semi-mature trees will require formative pruning up to three times before they reach maturity.

Good cultural practices such as supplying adequate irrigation/drainage, mulching, fertilising and pest control maintains trees in good health, this in turn reduces the risk of limb failure.

Tree protection – it is imperative to protect trees from physical damage including soil compaction. These activities can introduce secondary effects placing the tree under stress and therefore increasing the hazard of limb failure. The University has adopted the Australian Standard – Protection of trees on development sites.

Tree removal due to public risk

All trees have the potential to be dangerous, but it is the position of a tree in relation to people, vehicles and buildings that may necessitate the removal of a tree on safety grounds. The decision process is often difficult when concealed structural weaknesses are discovered in prominent trees that otherwise appear healthy.

The sudden removal of such trees can result in spirited criticism. In such situations it is essential that the local community is informed exactly what is going to happen and why. With suspect trees a consultant is commissioned to undertake internal investigations or Picus sonic tomography to determine the structural integrity of the tree. If all the information gathered indicates that the tree is dangerous in its position then its removal is scheduled as soon as possible.

Each year the University Arborist prepares a report of trees for removal. Dead trees, suspect and hazardous trees as well as trees that have reached the end of their useful life expectancy are then scheduled for removal and replacement.

Where possible dead or dangerous trees that require removal are pruned for safety and retained as habitat trees.

Tree Replacement

The ANU invests significant resources in the renewal of the ageing tree population by planting hundreds of trees each year and replacing all removed trees where possible.

As species of trees that have airborne particles that are likely to cause irritation or adverse reaction such as the Populus alba on University Avenue East, reach the end of their useful life, they will be replaced with species less likely to trigger such events.

In new development/landscapes many new trees are planted using more drought tolerant species.

Storms

The occurrence of violent storms can prompt a change in priorities, when all available resources are directed towards the clean–up. Failed branches and crotches expose defect trees and often destroy the trees structure which forces decisions to remove particular trees following storms.

Tree removal due to development

The past decade the University has embarked on an extensive capital works programme. Although every attempt is made to design around trees (particularly significant trees), inevitably development causes the loss of hundreds of established trees annually. Where practical established trees are transplanted rather then cut down. This practice is considered expensive and as a result is reserved for particularly valuable trees of smaller dimensions. The grounds section has been responsible for many successful tree transplant jobs across the campus.

Tree Removal due to interference with services

As previously mentioned the early tree planting programmes did not consider the universities future plans or underground services. As a result many trees have to be removed because they now interfere with services such as overhead cables, water mains, storm water and sewer lines. Large trees are also removed as they interfere with buildings, paths and roadways. Trees that prevent a clear line of sight for road traffic may also be considered for removal if pruning does not suffice.

Tree management with a digital tree survey

In 1998 the ANU Department of Forestry was commissioned to undertake a digital tree survey of the ANU campus. This Database includes over 10,500 trees, each with detailed information including: genus and species, ID number, position, dimensions, health and a maintenance record of each tree. The use of the survey as a management tool is enhanced by its flexibility. In 2008 the tree survey and associated software was replaced with a state of the art tree management system that has improved search functions and reporting capability as well as a risk register. Now each tree also has a photo and detailed inspection records.

The type and range of information that the survey is capable of producing facilitates the process of inspecting and scheduling tree surgery operations. The survey can produce images of all or part of the site with a variety of tree data ranging from all trees to a vast selection of fields such as individual species, significance, height, classification, tree health or what work is required.

Prior to inspections the survey may also be used as a reminder of trees that have had problems in the past. Printed extracts from the tree survey are used to graphically describe tree maintenance work to contractors and staff. These plans identify individual trees and describe the specific nature of the work required. On completion these records are entered into the database. Detailed reports of work for different time periods can also be produced. Following regular updating of the survey this data will form the basis for forecasting future budget needs.

The tree management system is also used extensively to produce preliminary tree reports to guide development layout and then impact assessment reports required for development approval.

The digital tree survey makes the task of managing the treescape a more exact process which is protected from the problems associated with a key member of staff leaving the ANU with all the crucial tree knowledge in his/her head. Having a detailed record including a history of events on each tree assists in future management decisions and aids when defending public liability claims.

Classification of individual trees

For the purpose of organising and separating records each tree has been classified according to a particular value. For the purpose of keeping an historical record, the identity and location of trees that have been removed remains within the database and their position is normally hidden. Trees are rated as EXCEPTIONAL, HIGH, MEDIUM OR LOW. These classifications have an influence over the development of the campus because a priority is given to retaining and protecting exceptional and high quality trees. Detailed information relating to the protection of trees during the development of the campus is contained in the landscape protection guidelines.

The following criteria is used to classify trees on the ANU campus:

Exceptional

To be classified as exceptional a tree must satisfy one or more of the following criteria -

1. Compositional

1. The tree is a prominent individual in the campus landscape.
2. The tree is one of a group which is prominent within the campus landscape.
3. Any tree, which due to its location or context provides a major contribution to the landscape and/ or University.

2. Cultural Heritage

1. Any tree commemorating or having associations with notable people, an important historic event, or phase of development.
2. The tree remains from a planting of the site prior to its use as a University campus.
3. Any tree associated with Aboriginal activities: No trees on campus have been identified.

3. Natural History

A large, remnant specimen.

4. Rarity

The tree is a species that is rare in Canberra.

5) Environmental/Micro climate service

Any tree that provides a significant positive modification to the local micro-climate.

5. In Addition

No tree is rated as Exceptional if it is not in good condition unless it ranks so highly under one or more other criteria that special provisions (eg denying people access within its canopy) are warranted.

The tree must also be growing in a suitable location that allows for their continued growth and prosperity and have a useful life expectancy of more than ten years, informed by how long a tree is likely to remain in the landscape based on factors of health, amenity, environmental services contribution and risk.

High

To be classified as high a tree must be well established, 13 – 25 m tall with dbh > 40cm. Poor condition downgrades significance rating by one category (ie moderate).

Moderate
Any moderately sized tree 6 – 13 m tall with dbh > 10cm. A tree may be classified as moderate if it is immature and is not yet well established. A tree may also be classified as moderate despite being well established if it shows poor health.

Low

New plantings/small trees <6 m tall with dbh < 10cm. Trees of high significance that are dead and moderate sized trees in poor condition.

Summary

The trees of the ANU campus have high aesthetic and ecological value and are held in high regard by the management and general community of this university. Substantial funds are allocated each year to managing this natural resource that is in a constant state of change. The primary aim of the tree management plan is to maintain our trees in a healthy and safe state and to protect and retain them as a dominant feature of the ANU campus.