Using 'TRAPS' (Transect Recording and Processing System) in Woody Weed Control Studies in Australia

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Abstract

The 'TRAPS' (**T**ransect **R**ecording **A**nd **P**rocessing **S**ystem) methodology has proven to be a powerful and versatile tool for studying the effects of various woody weed control strategies in studies carried out in Queensland, Australia. 'TRAPS' allows the tracking of individual woody plants even when destructive control techniques such as bulldozing, ploughing and burning are used. This methodology also allows the investigator to discriminate between plants present before any treatment is imposed and plants recruited after the treatment.

Keywords: 'TRAPS', methodology, woody weed control

Introduction

Woody weeds (unwanted trees and shrubs and their suckers, regrowth or seedlings) are a major constraint on pasture production in the grazed woodlands of Queensland, Australia (Scanlan 1984, Tothill and Gillies 1992). These weeds include exotic species such as prickly acacia (*Acacia nilotica*) and the increase in cover/density of many endemic species following land use change to domestic livestock grazing. Many native woody species also regrow vigorously after the trees and shrubs are cleared to increase pasture production. Because of

the diversity of species involved a quick but accurate method of assessing the effectiveness of control strategies is needed. The standard assessment methodology, recording the number of plants in treated plots before and after treatment (Australian Weeds Committee 1979), is unsatisfactory particularly where plants are scattered, regrow from roots and seed or where large plots are needed to obtain suitable plant numbers. In the latter case an accurate plant count is difficult and time consuming. 'TRAPS' (Transect Recording And Processing System, Back *et al*. 1997, Back 1999, Back *et al*. 1999) was developed initially as a system for the long term monitoring of woody plants in grazed woodlands of northern Australia. It is a methodology that allows individual woody plants to be identified and tracked through time giving accurate results from low plant numbers. This is particularly important when there are a number of woody weed species present. Computer software for field data collection and subsequent analysis has been developed as part of 'TRAPS'.

Material and Methods

Fixed width and length belt transects are laid out within the treated plot area allowing an adequate buffer around the plot. The belt transects are four metres wide, (accurate location and later re-location of plants being difficult at more than two metres from the transect mid-line) and commonly in 50m long segments. Individual transect belts are positioned either some distance apart (usually at least two times the height of the tallest plants apart to minimise roots from one belt impacting on the roots of plants from the neighbouring belt) or adjoining for a measured block (Figure 1). This flexibility allows plot size and sampling area to be suited to the woody weed density at the site. The central transect lines are located using pegs, either wooden or steel, in such a way that if a peg is (deliberately or accidentally) removed, that peg can then be re-located. This is achieved by accurately measuring out the location of the transect within the plot. Once a design is settled on it should be adhered to for

all plots to avoid confusion. A tape measure, usually 50m long, is stretched between the transect pegs to give a straight midline for the belt transect. The origin or zero ends is constant for all transects in all plots (e.g. SW peg for a number of north-south transects). A two metre long (wooden dowel or metal) rod marked in 10 or 20cm gradations are used to locate the woody plants within the four metre wide belt.

The location of each plant is determined by recording its distance along the central tape and the distance it is out from the tape on either the right or left hand side facing away from the origin. The plant is identified to species and its height, circumference/diameter at 30cm above ground level, number of stems and canopy measurements recorded. Defoliation ratings and comments on the condition of the plant can also be made. This allows all the plants present in the transects to be recorded prior to treatment and at intervals following treatment. The effects of the treatment are recorded, along with any new plants appearing, whether seedlings or root regrowth.

Results and Discussion

The 'TRAPS' methodology enables an accurate assessment of any regrowth following a control treatment, whether that regrowth comes from new seedlings establishing after the treatment, or from butt or root regrowth (suckers) initiated by the treatment.

The small error involved when accurately tracking individual plants allows the use of a lesser numbers of plants than when using conventional assessment methodologies with an inherent large amount of error. This is particularly so when evaluating destructive methods of woody weed control such as the cut stump method, mechanical control (ploughing, bulldozing) or fire. Tagging individual plants, the most accurate conventional methodology, is not appropriate when using these destructive treatments.

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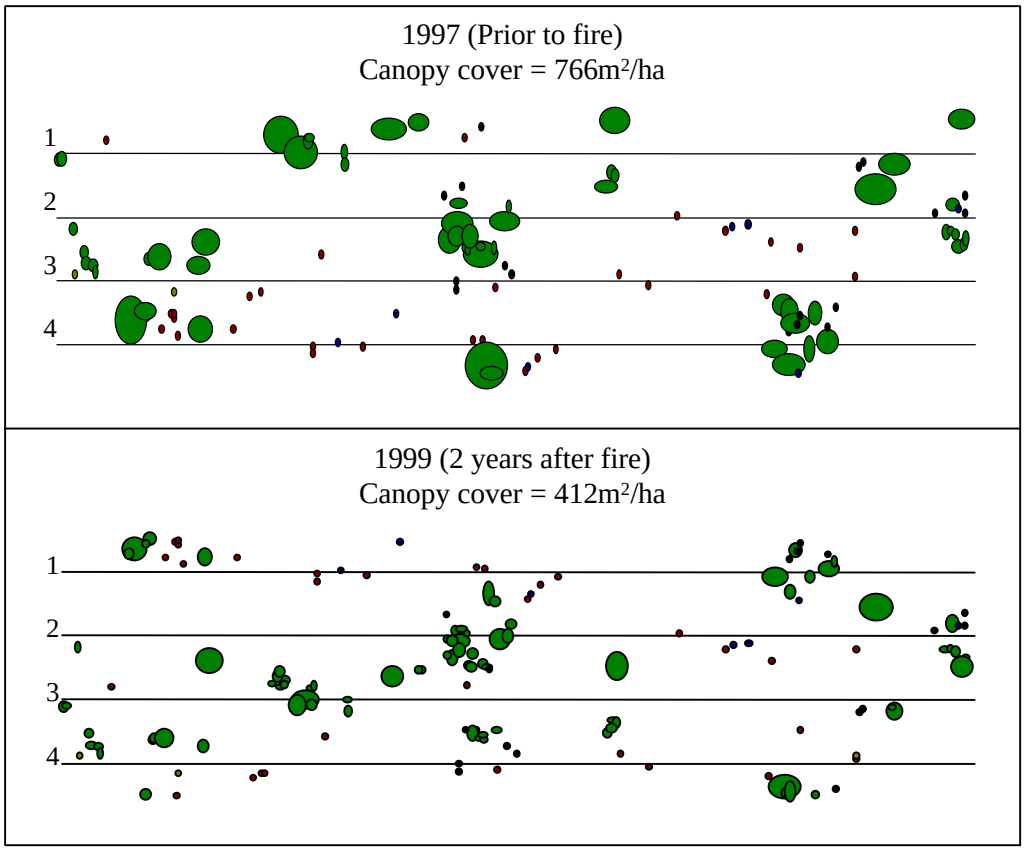

Figure 1 - Example of adjoining transects sited to give a continuous recorded block. There are four transects 50m long and 4m wide giving a sampled area of 800m^2 (50mx16m). The diagram shows the effect of a pasture fire in 1997 on the canopy cover of the woody plants present (Graphic shown is output from the 'TRAPS' analysis package).