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RECOVERY OF MALLEE VEGETATION FOLLOWING DISTURBANCE ON SEISMIC LINES IN FAR-WESTERN NEW SOUTH WALES

S. Gowans and S. Todorov

University of Ballarat, PO Box 663, Ballarat, VIC 3353

INTRODUCTION

Geological survey in Australia's rangelands has led to thousands of kilometres of bulldozed seismic lines. Whilst only approximately five metres wide they amount to thousands of hectares of cleared native vegetation. In many regions the cutting of seismic lines shows as a grid readily visible on satellite images. Although the area directly disturbed is relatively small, the potential environmental consequences include erosion, increased access to feral animals and the introduction of exotic flora (Farrell 1986).

Following mechanical disturbance, management of these areas requires that rehabilitation of terrain, soil surfaces, plant species and aesthetic values takes place. The proposed criteria for the rehabilitation of the disturbance is that these landscape values be returned to their original form or to a reasonable resemblance of it (Fatchen & Woodburn 1999). Plant cover is one landscape value where there have been few assessments of natural regeneration after mechanical disturbance (Walker & Koen 1995). There needs to be a better understanding of interactions between native plants and mechanical disturbance for the proper management of these areas.

A study was undertaken in an area of far-western New South Wales to investigate the recovery of mallee vegetation following disturbance along seismic lines. This study, focusing on Mallee shrubland and Mallee *Triodia* communities was conducted approximately 10 years following the disturbance.

METHOD

Assessment was conducted in early September 1999. The study area (Nanya Station) is located in far western New South Wales adjacent to the South Australian border. Study sites were selected within Mallee shrubland and Mallee *Triodia* vegetation communities, where both communities were located along the same seismic line.

Plots and point-quarter sampling were used to assess the vegetation associations on the seismic line and within undisturbed vegetation (Kent & Coker 1992). Random sampling was undertaken in homogeneous undisturbed communities and along the seismic line. The optimum size of the quadrat for a particular community type was based on the concepts of minimal area and species area curves. Sample size varied for different communities and seismic lines (Kent & Coker 1992).

RESULTS AND ANALYSIS

Mallee shrubland

Mallee shrubland unaffected by seismic line activity consisted of an overstorey of *Eucalyptus dumosa, E. gracilis, E. oleosa, Myoporum platycarpum* subsp. *platycarpum* and *Alectryon oleifolius* subsp. *canescens.* On the seismic line, only one *Eucalyptus socialis* was present. Within the shrublayer of both the undisturbed community and the seismic line *Acacia colletioides, Dodonaea viscosa* subsp. *angustissima, Eremophila glabra, E. sturtii, Senna artemisioides* nothosubsp. *coriacea, S. artemisioides* subsp. *filifolia,* and *S. artemisioides* subsp. *petiolaris* were present. *Acacia burkitii, Exocarpos sparteus* and *Templetonia egena* occurred only in the unaffected community, whilst *Olearia pimeleoides* occurred in both the undisturbed community and the seismic line. There was a significant increase (from 14% to 57%) in relative density of *Dodonaea viscosa* subsp. *angustissima* following disturbance. *Leichhardtia australis, Maireana georgei* and *Zygophyllum aurantiacum* occurred within the groundlayer of the unaffected community, where only *Maireana georgei* was regenerating on the seismic line.

Mallee Triodia

The overstorey within the undisturbed Mallee *Triodia* community included *Eucalyptus dumosa, E. socialis, E. gracilis, Myoporum platycarpum* subsp. *platycarpum* and *Alectryon oleifolius* subsp. *canescens* whilst, at the time of the study, the seismic line supported an overstorey consisting of *Eucalyptus dumosa* and *Myoporum platycarpum.* Shrubs associated with both the undisturbed community and seismic line included *Dodonaea viscosa* subsp. *angustissima, Senna artemisioides* subsp. *petiolaris, Eremophila glabra* and *Olearia muelleri.* Regeneration of *Acacia colletioides, Grevillea heugelii, Eremophila sturtii, Exocarpos aphyllus, Senna artemisiodies* subsp. *filifolia* and *S. artemisiodies* subsp. *coriacea* was not evident on the seismic line but occurred within the undisturbed community. Ground species within the undisturbed community included *Triodia irritans* subsp. *scariosa, Maireana georgei, M. pentatropis, Einadia nutans,* and *Vittadinia cuneata* whilst the seismic line supported *Triodia irritans* subsp. *scariosa,* and *Vittadinia cuneata* only. A significant difference within the groundlayer was evident with an increase (from 59% to 80%) in relative density of *Triodia irritans* subsp. *scariosa* following seismic line disturbance.

DISCUSSION

The recovery of vegetation on the seismic line following disturbance was evident although, there were changes in species composition and dominance.

Little regeneration of eucalypts had occurred on the seismic line adjacent to the Mallee shrubland community. The explanation for this was not evident from this study although, it can be speculated that there may be competition for resources between the tree, shrub and ground species, where in this instance there is extensive shrub regeneration. In contrast, on the seismic line adjacent to the Mallee *Triodia* vegetation community there was regeneration of *Eucalyptus dumosa,* proving to be a good coloniser within this vegetation association.

Dodonaea viscosa subsp. *angustissima* on the seismic line adjacent to the Mallee shrubland appears to be out-competing other regenerating species. The dense regeneration of this species shows woody weed invasion following disturbance. Woody weeds are not recognised as a problem until their numbers and size have caused some interference with management but, by this stage the plants are usually well established and are more difficult to control (Longmore 1991; Robson 1994).

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