

DISTRIBUTION OF SPINY RUSH (*JUNCUS ACUTUS* L.) IN THE UPPER WIMMERA FARM TREE GROUP AREA

M.S. Gibson and J.D. Miller

^A Centre for Environmental Management, University of Ballarat, PO Box 663, Mount Helen, Victoria 3353, Australia

Summary Spiny rush is a noxious weed throughout Victoria except for the Melbourne metropolitan area. In the Wimmera region of western Victoria, spiny rush infests drainage lines and low-lying saline areas. This paper presents the initial findings of a study into the distribution of spiny rush in the Upper Wimmera Farm Tree Group Area.

Survey forms were distributed to landholders in the study area who were requested to indicate the location, age and other notes of all infestations of spiny rush on their properties. Landholders were also asked to indicate where the weed was absent. This data and digital data from other sources was used to construct a digital database for the study area using a geographic information system.

A low number of surveys were completed by landholder which limited the ability to map the full distribution of the weed over the study area. The low level of survey returns indicates that concern over the status of the weed varies between landholders.

INTRODUCTION

Background Spiny rush (*Juncus acutus* L.) was proclaimed a noxious weed in 1958 for the whole of Victoria except the Melbourne metropolitan area (Parsons 1973).

Spiny rush produces very small seeds which may be dispersed by vehicles, stock, water or in agricultural produce (Parsons and Cuthbertson 1992). Where the plant occurs on drainage lines or low lying flats, water is the primary means of dispersal.

Control measures applied to spiny rush infestations include chemical treatment, mechanical removal, and improvement to the drainage of moist sites. Chemical control is not always appropriate due to the size and density of large infestations, and problems with spraying along drainage lines and inundated areas. Mechanical extraction is generally the most successful control technique. In some cases heavy machinery such as grader-blades and bulldozers have been applied. Specialized machinery which can remove individual plants from beneath the ground has also been developed or modified for use with spiny rush.

The Upper Wimmera Farm Tree Group (UWFTG) is a combination of several landcare groups which focus on regeneration of trees on private land in the upper reaches of the Wimmera River catchment. The UWFTG Area was chosen as the study area for this investigation into the

distribution and ecology of spiny rush in the Wimmera following approaches from the UWFTG. This paper presents the initial findings of this study, and forms part of ongoing University of Ballarat research into the application of Geographic Information Systems (GIS) to weed management in Victoria.

Study aims The aim of this part of the study is to map the distribution of spiny rush in the UWFTG Area from records provided by landholders and enter the data into a GIS.

MATERIALS AND METHODS

Study area The study area is approximately centred on Stawell (Figure 1), and ranges from Halls Gap and Glenorchy in the west to Navarre and Elmhurst in the east. The study area contains 46 of the sub-catchments identified by the Wimmera Catchment Co-ordinating Group (1992). Most of the land in the study area is privately owned and used for sheep grazing and cropping purposes.

Survey techniques As this project has enthusiastic support from landholders, a landholder based survey of spiny rush was chosen as the primary source of data. Each landholder was requested to indicate the location of spiny rush infestations on their property, either by marking the infestations on Country Fire Authority maps, or by written geographic co-ordinates. Landholders were also requested to indicate where the weed was absent on their properties. The density of the infestations was estimated on a three point scale (Table 1). Landholders were also asked to comment on the age of infestations, whether or not they were spreading and control measures applied to the infestations.

Table 1. Categories used to estimate the density of spiny rush infestations.

Category	Description
Low	Pasture or other plants dominate the site; scattered plants only.
Medium	Spiny rush dominates the site; ground visible between the plants, leaves of adjacent plants not touching.
High	Thick and difficult to walk through, leaves of adjacent plants overlapping.

Mapping A digital database of the study area was constructed using the vector based GIS ArcInfo®. 1:25 000 scale topographic data was obtained from the State Data Centre (Office of Geographic Data Co-ordination). Sub-catchment boundaries were digitized from 1:250 000 scale map produced for the Wimmera Integrated Management Strategy (Wimmera Catchment Co-ordinating Group 1992). The location of spiny rush infestations was mapped from the Landholder questionnaires.

PRELIMINARY RESULTS

Survey responses Less than 50% of the landholders surveyed completed the survey forms. Those that completed the forms expressed having difficulty with the use of map grid references.

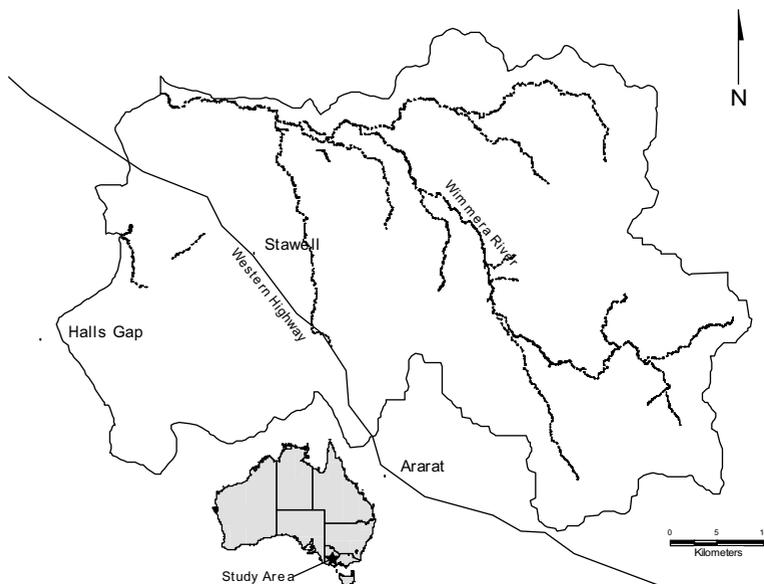


Figure 1. Location of the study area.

Spiny rush distribution The majority of infestations were found along drainage lines and in low lying areas. In areas subject to low grazing pressure, several landholders noted that the plant was spreading into adjacent pasture.

Degree of infestation varied between subcatchments. Large areas of Mount Cole Creek were infested, other catchments e.g. Surridge Creek were free of infestation.

The majority of landholders who completed surveys commented on the spread of the plant. In many cases infestations were actively spreading along drainage lines and into adjacent pastures.

DISCUSSION

The low level of reply by landholders has limited the capacity to map the distribution of spiny rush over the UWFTG Area. Some landholders who are obviously concerned with the status of the plant in the region have appeared to have comprehensively mapped the presence or absence and density of infestations over their entire properties. Other landholders have provided no information, either indicating that they did not receive or understand the survey forms or they are not concerned with the status of the weed on their properties or the wider community. Following discussions with UWFTG members after the first round of surveys, the survey form is currently under review for redistribution to landholders.

In this type of study where a large, diverse group of people independently collect data, very careful consideration must be given to the questions the survey asks and the format of data collected.

Ongoing research This paper presents the initial findings of this study. Ongoing research into the distribution and ecology of spiny rush in the UWFTG Area includes:

Investigations into the suitability of remote sensing techniques to mapping infestations. Low level oblique aerial photography has been used with success on other noxious weed species (Miller 1996). A series of photographs have been captured for a subset of the study area.

Investigations into the edaphic factors affecting the presence/absence and density of infestations for the various land systems found within the study area.

ACKNOWLEDGMENTS

We would like thank the members of the Upper Wimmera Farm Tree Group and Rick Pope at the State Date Centre (Office of Geographic Data Co-ordination) for the provision of digital topographic data.

REFERENCES

- Miller, J.D. (1996). Mapping the distribution of weeds with cost effective remotely sensed data. Proceedings 11th Australian Weeds Conference, pp. 501-4.
- Parsons, W.T. (1973). 'Noxious Weeds of Victoria'. (Inkata Press, Melbourne).
- Parsons, W.T. and Cuthbertson, E.G. (1992). 'Noxious Weeds of Australia'. (Inkata Press, Melbourne).
- Wimmera Catchment Co-ordinating Group (1992). 'Wimmera River Integrated Management Strategy'. (Wimmera Catchment Co-ordinating Group).