A rapid mapping method for *Themeda quadrivalvis* (grader grass) and other roadside weeds

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Summary An inexpensive and rapid method of mapping grader grass (*Themeda quadrivalvis* (L.) Kuntze) was developed to assist strategic planning and on ground management of infestations. The need for a rapid mapping method arose amid concerns that grader grass was expanding into native grasslands and away from traditional linear infestations on roads, tracks and fence lines in National Parks in Northern Queensland.

Keywords *Themeda quadrivalvis*, mapping, GPS, strategic planning, roadsides.

INTRODUCTION

Introduced high biomass grasses such as grader grass have the potential to severely impact the conservation values of national parks. They replace the native grasslands and increase fuel loads, thereby changing fire behaviour (Stocker and Mott 1981, J. Clarkson pers. comm. 2006).

Grader grass is readily spread through road, track and fence line maintenance. It was once considered to be confined to these disturbed areas. However, in tropical savannas it readily invades native grasslands and reduces diversity (Smith 2002). In certain situations it has colonised large expanses, several kilometres in width, expanding out from the original roadside infestation (J. Clarkson pers. comm. 2006).

The Queensland Parks and Wildlife Service's Technical Support Unit has developed a simple methodology to rapidly map the infestations to assist in the strategic management of this threat to native grassland. The methodology allows staff with a range of technical expertise to collect data to map the level of infestation.

MATERIALS AND METHODS

The methodology involves using a GPS to record the geographical position of the start of a 500 m transects along a road, track or fence line. The operator then travels along the road for 500 m and records the code for the worst level of infestation encountered within that transect. Another waypoint is collected and the 500 m transect traversed and infestation level recorded. This continues until the survey is finished.

Table 1 shows the six codes used to define the levels of infestation and Figure 1 provides a diagrammatical representation of each code.

The GPS survey data is down loaded and converted into a Shapefile. The attribute table is edited and the infestation code added to each point. This allows a map to be produced showing the infestation trends across the area surveyed.

Table 1. Infestation codes.

Code	Description of infestation
0	No plants present – free
1	Scattered individual plants within 5 m of road edge
2	Clumps forming within 5 m of road edge
3	Individuals or clumps present within 20 m of road edge
4	Individuals, clumps or dense infestations within 100 m of road edge
5	Individuals, clumps or dense infestations greater than 100 m from road edge

RESULTS

The mapping method has been trailed mapping infestations of grader grass along approximately 230 km of tracks covering 60,000 ha of Undara National Park (Figure 2) and 260 km of tracks covering 140,000 ha of Lakefield National Park (Figure 3).

DISCUSSION

The time involved to survey Undara NP and produce the map was 12 vehicle hours (or the equivalent of two days by one vehicle) and approximately one hour of post processing to produce the maps. A total cost of approximately $1500 to survey 230 km of road.

This method requires little technology apart from a GPS and a basic GIS mapping program in comparison to other methods of remotely surveying infestations which requires purchasing and interpretation of high resolution aerial images. Comparing costs alone the cost to purchase high resolution images from unmanned aerial vehicles (UAV's) to cover the 230 km of roads at Undara National Park would be approximately $30,000.

Staff involved in the process gain an on ground feel for the level of infestation as well as an immediate picture of the infestation across the park or property. The information can then be included in property pest planning, the development of targeted pest

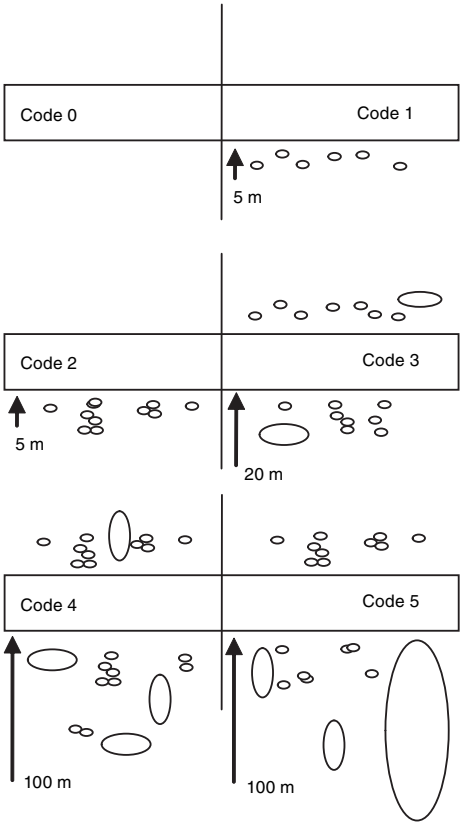

Figure 1. Diagrammatical representation of infestation codes (See Table 1).

management operations and the alteration of operational practices to minimise the spread into weed free areas. Figure 3 shows how the mapping product can be use to plan the location of containment and eradication zones and clean down areas.

ACKNOWLEDGMENTS

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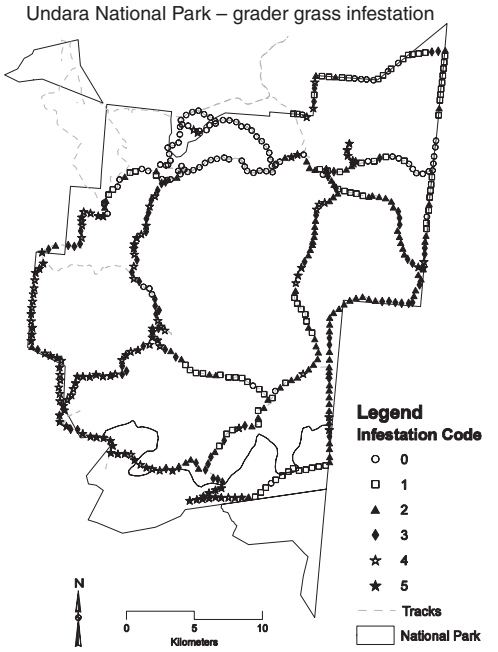

Figure 2. Distribution map produced from mapping an infestation at Undara National Park.

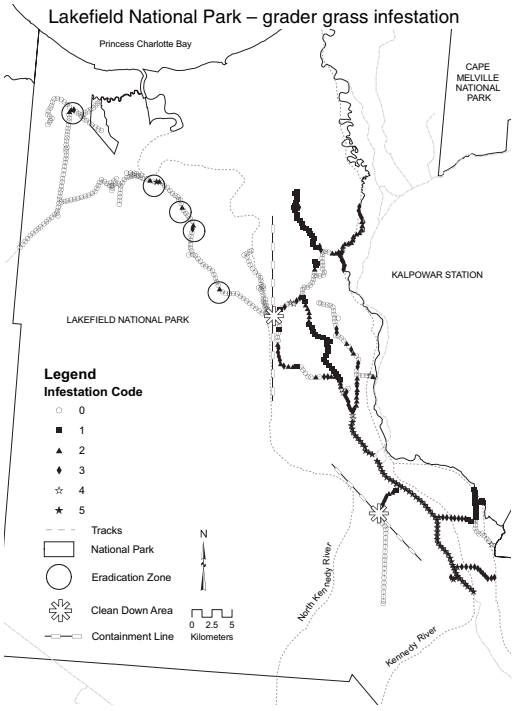

Figure 3. Distribution and planning map produced from mapping the infestation at Lakefield National Park.