

The Distribution and Impacts of Lippia (*Phyla canescens*) in the Murray Darling System.

Final Report to the Lippia Working Group
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Executive Summary

Lippia occurs predominantly on the clay soil floodplains of the inland river system in the 500-800mm annual rainfall zone of Queensland and NSW, although it is present in varying density within each of the 19 catchments Murray Darling Basin. The worst affected catchments are the Condamine, Border Rivers, Gwydir, Namoi, Lachlan, Murrumbidgee and the Murray. Lippia is currently estimated to be distributed across at least 5% of the Murray Darling Basin occurring across a total area in the order of 5.3 million hectares.

The spread of Lippia appears to be clearly related to flood events. Many farmers, particularly south of the Queensland border, stated that Lippia has become a problem since specific flood events. In the Gwydir region the Lippia population increased markedly following the 1996 flood and again after the 1998 floods. In the Lachlan a significant increase in Lippia followed the floods of 1990. Many farmers and agency personnel reported the increasing occurrence of Lippia in hilly areas, well above flood water reaches and onto lighter soils.

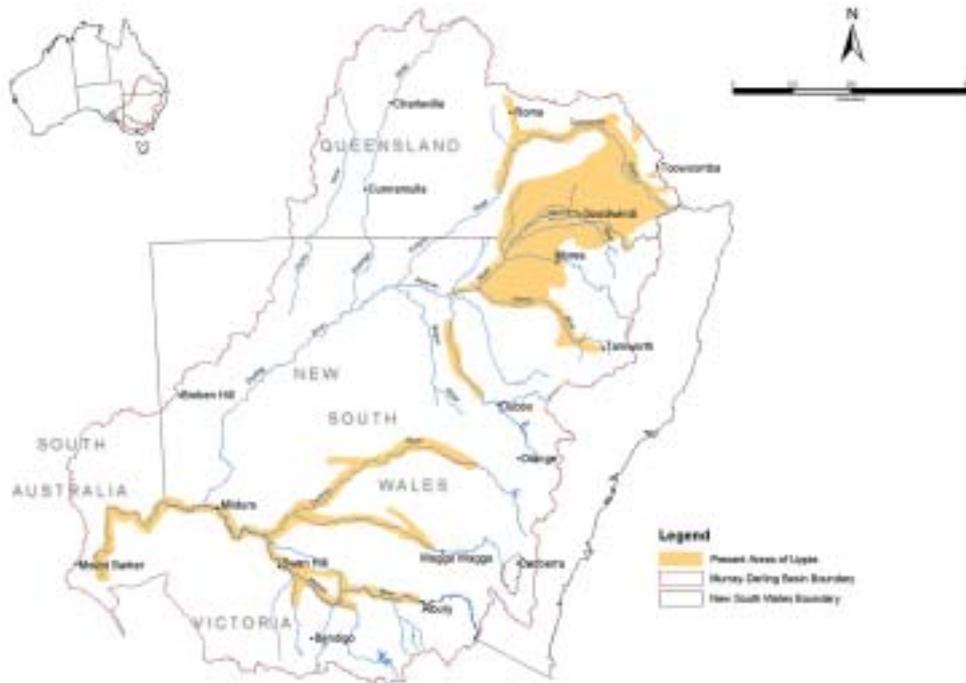
A period of significant rainfall and flooding will likely result in an 'explosion' in the Lippia population similar to that observed throughout many catchments during the 1990s. Lippia is primarily dispersed on flood waters and readily establishes on bare ground. There are vast areas of the Murray Darling Basin currently devoid of groundcover and Lippia the only species present retaining any amount of green leaf. Given suitable climatic conditions Lippia has the potential to spread throughout the entire floodplain region of the Murray Darling Basin.

The cost of Lippia to the livestock grazing industries of the Murray Darling Basin is conservatively estimated to be \$38 million per annum in lost production. In addition there are significant costs associated with herbicide application, clearing and development costs and damage to rural infrastructure. The majority of respondents to a farmer survey nominated Lippia as their worst weed. The average reduction in stocking rate attributed to Lippia was 55%, however, a significant number of respondents reported 100% destocking of some areas severely affected by Lippia.

More significant are the costs associated with the loss of environmental services estimated to be \$1,800 million per year. These losses are estimated in terms of the loss of biodiversity and perennial vegetation, increased rates of erosion and reduction in water quality. The primary threat from Lippia lies in its direct impact on groundcover in floodplain communities. The spread of Lippia has significantly impacted and continues to threaten biodiversity throughout the Murray Darling Basin. A significant number of listed threatened species are restricted to the environments where Lippia tends to predominate.

Conventional methods of herbicide application and low density grazing management regardless of stocking rate have provided no effective long-term suppression of the spread of Lippia. The use of herbicides is also restricted by the presence of susceptible crops and the primary area of infestation being along waterways. Lippia may be managed by cultivation, however, in many areas the practice is not sustainable as there is a significant risk of soil loss associated with cultivation of areas adjacent to waterways.

There is an urgent need for research to gain a better understanding of Lippia and develop practical management solutions. Biological control may be the only effective option to control Lippia where it occurs as a dominant groundcover component in reserve areas, woodlands and forests or along stream banks where access is difficult and cultivation is not an option. Revegetation of stream, creek and river banks with perennial grasses is necessary to prevent the continual erosion of these areas. In the short term active management to promote the level of groundcover is an action that may be undertaken by landholders immediately to reduce the opportunity for Lippia establishment or spread. The application of planned grazing principles has reportedly provided control of Lippia in a number of situations.



Estimated current distribution of Lippia throughout the MDB sourced from existing data and interviews with a wide range of stakeholders.



Estimated short-term (10-20 years) potential distribution of Lippia throughout the MDB.

Forward

Due to the concerns of landholders about the rapid spread of Lippia and its subsequent economic and environmental impacts the Australian Cotton CRC convened a research priorities workshop with the CRC for Weed Management in June 2002. A number of research and education needs were identified at the workshop, which included the establishment of the Lippia Working Group. The Lippia Working Group is grateful to the Murray Darling Basin Commission which provided funding for this study.

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Background

Lippia (*Phyla canescens*) is a significant and increasing problem in the entire Murray Darling Basin river system. In response to landholder concern the Murray Darling Lippia Working Group was established to raise awareness of Lippia, to quantify the extent of the problem and to source funding for research and management of the plant.

The current project was initiated to determine the distribution and the economic and ecological impact of Lippia in the Murray Darling system. The scope of this project was to:-

- > Assess past and current information on the distribution and impact of Lippia
- > Report economical and environmental information to assess the impact of Lippia at the property, sub-catchment, catchment and Murray Darling Basin level.
- > Report any known information on the distribution outside the Murray Darling Basin
- > Quantify the current distribution and severity of Lippia
- > Determine the rate it has spread over time
- > Evaluate the potential future distribution of Lippia
- > Report the economic impact of Lippia on farm activities, production and productivity
- > Evaluate the impact of Lippia on the environment
- > Prepare a brief research priority plan for the weed
- > Provide a brief summary of current best bet management options

Consultation process

Stakeholder interviews

A list of key contacts was provided by members of the Lippia Working Group and local contact lists were prepared for field trips to specific areas. More than 250 individual stakeholders from across the Murray Darling Basin were contacted and most were interviewed either by phone, on site or at focus group meetings. Those contacted represented a wide range of government agencies, Department of Infrastructure Planning and Natural Resources (previously DLWC, and DSNR), CSIRO, NSW Department of Agriculture, Qld Department of Primary Industries, Local Government, Rural Lands Protection Boards as well as Agribusiness companies, consultants and landholders from regions throughout the Murray Darling Basin.

Input from each was documented and has been incorporated in the preparation of this document. A group of 15 landholders contributed more detailed information for inclusion as case studies to highlight the impact Lippia is having at the property scale in a range of areas throughout the Murray Darling Basin. The list of all those who were approached and input invited during the course of the study is provided in Appendix I.

Focus group meetings

A series of focus group meetings were conducted at a range of centres during the course of the project. Three meetings were held where a wide range of extension personnel, local government, government agency representatives, scientists, consultants, advisors and landholder representatives were invited. These meetings were conducted in Goondiwindi, Moree and Toowoomba. In addition, a further two focus group meetings were conducted specifically for landholders in regions severely affected by Lippia invasion, these were held on site at the Gingham Watercourse west of Moree and at Kings Creek, Clifton, north of Warwick.

The objective of these meetings was to obtain input from a wide range of individuals and stakeholders on the known extent of the distribution and impact of Lippia in their respective regions as well as the rate of increase and thoughts on the potential cause of the rapid increase in the affected area. Input was also sought on participant's views and ideas for future research priorities and their knowledge of any practice which had achieved successful control of Lippia.

The views and opinions of participants presented at these focus group meetings have been incorporated in the relevant sections throughout the current document. The list of all participants at the respective meetings are included in the attached Appendix I.

Field trips

Field trips were undertaken to areas within eight of the 19 Murray Darling Basin catchments over the duration of the study. Activities undertaken during field trips included site visits, landholder and other stakeholder interviews to determine the extent of distribution, percentage cover and impact of *Lippia*.

Specimens of *Lippia* were collected from a total of 80 sites and 45 soil samples were collected from sites where *Lippia* was extant. Analysis of these specimens was beyond the scope of his project but they may be a valuable resource for future work on the taxonomy of the species and characterisation of sites where *Lippia* occurs.

The areas visited in the south included the Murrumbidgee catchment from Hay to Balranald, the Murray catchment from Tooleybuc to Swan Hill and the North Central catchment in Victoria. In the Namoi catchment sites were inspected in and around Gunnedah, Quirindi, Boggabri, Narrabri and Wee Waa. Within the Gwydir catchment sites were visited from Inverell to the Gingham Watercourse west of Moree and north to Mungindi, Toobeah, Goondiwindi, Boggabilla and Yetman in the Border Rivers catchment of NSW and Queensland. The Condamine catchment was the most northern area visited and sites were inspected in the area from Toowoomba to Warwick.

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