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HUDSON PEAR: A CO-ORDINATED WEED MANAGEMENT PROGRAM IN WESTERN NSW

I L Kelly[1] and C H Bergin[2]

[1] Castlereagh Macquarie County Council, PO Box 227 COONAMBLE NSW 2829

[2] Western Catchment Management Authority, PO Box 248 WALGETT NSW 2832

INTRODUCTION

Hudson pear (*Cylindropuntia rosea*) is a branched cactus that grows to a height of about 1.5 metres and produces cylindrical, rope-like segments growing from a cylindrical trunk (Holtkamp 2006). The cactus has formidable spines encased in a detachable sheath (like a barb at the end), which become embedded upon contact and are difficult to remove. Infestations affect biodiversity and primary production as they can compete with other plants and injure native wildlife, humans, stock and other animals. Hudson pear is thought to be a hybrid of a similar cactus, *Cylindropuntia tunicata*, and another species. It is known to reproduce vegetatively, with segments spread by livestock, wildlife, feral animals, vehicles, human traffic and water. Of Mexican origin, Hudson pear was first recorded in Walgett Shire in the late 1960s. Spraying over the decades has had a positive impact in suppressing the weed, however with significant drought conditions experienced over recent years, Hudson pear has rapidly increased in extent, both in areas of thicker core infestations and scattered known and new infestations. Affected areas include red ridge country used for grazing and opal mining, which also supports tourism, and more recently, the surrounding floodplain and plains country principally supporting grazing and cropping.

Control of Hudson pear has traditionally relied on herbicide application, with locally present biological control agents for other cactus species not effective and physical removal difficult. The spread from red ridge country into surrounding floodplain country is of particular concern as a major flood event could result in a significant increase in the distribution of the pest cactus through the Barwon-Darling River system (Holtkamp 2006). As a Category 4 noxious weed under the Noxious Weeds Act, 1993, the growth and spread of Hudson pear in NSW must be controlled according to the measures specified in a management plan published by the local control authority and the plant may not be sold, propagated or knowingly distributed.

HUDSON PEAR MANAGEMENT IN THE WALGETT SHIRE

The history of Hudson pear management over the decades in Walgett Shire has been documented in Castlereagh Macquarie County Council (CMCC) records. Unfortunately, control efforts were not implemented until Hudson pear infestation was beyond complete eradication and work was also hampered by a lack of public awareness, with local garden planting of Hudson pear continuing while spraying was underway. Castlereagh Macquarie County Council Weeds Officer in the 1990s, Mr Stan Joyce was an expert on the Hudson pear problem. In the 1980s, Hudson pear was a significant problem around Lightning Ridge, growing in the streets and yards as well as the surrounding opal mining areas. Spraying by Castlereagh Macquarie County Council from the 1970s and the Prickly Pear Destruction Commission until the 1980's were effective in reducing the infestations of Hudson pear and suppressing the spread of the pest cactus.

Recent drought conditions, especially since 2001, reduced native pastures in the area and provided good conditions for the cactus to spread. Capable of persisting in dry conditions, Hudson pear had a lack of competition from native pastures to inhibit the continued spread of segments. While the extent of Hudson pear at Lightning Ridge did not reach 1980s proportions, the cactus became more prevalent again in the Permissive Occupancy opal mining areas around Lightning Ridge, at Cumborah, and around the Grawin-Glengarry opal mining areas, where core infestations were significant. Scattered infestations were also present, including spreading from core areas and out into surrounding floodplains.

The recent increasing Hudson pear problem in Walgett Shire was faced by various groups, often with a local focus and, at times, independently of other involved stakeholders. As might be expected, the results of control and mapping work varied in terms of resources and recorded success. Five years ago, the extent of the total Hudson pear problem across Walgett Shire was not accurately known and there was a lack of clarity regarding species identification. In 2003, expert botanist identification of Hudson pear was *C. tunicata*, however subsequent collection of flowering material enabled identification as *C. rosea*, a plant also naturalized in Western Australia and in South Australian locations (Hosking 2007).

Before 2005, the problem around Lightning Ridge and surrounding Permissive Occupancy opal mining area was better documented than other parts of Walgett Shire. In addition to CMCC records, mapping was undertaken as part of a research project by Matthew Goodwin National Heritage Trust Envirofund grants contributed $48,000 to LRMA control of Hudson pear from 2002-2004, in the Permissive Occupancy opal mining area and subsequently also on neighbouring properties (Walgett Shire Council 2005). LRMA and volunteer control work in these areas continued after the projects. In 2004, a local delegation visited NSW Agriculture Minister, The Hon. Ian McDonald to discuss the problem. In December 2004, a joint funding program for *C. rosea* control on public land in the Shire included contributions of $11,000 from Walgett Shire Council, NSW Agriculture (now NSW Department of Primary Industries (DPI)) and Castlereagh Macquarie County Council. NSW Department of Natural Resources (DNR) also contributed, including through accessing Department of Lands funding for control work on Crown Lands.

While the current problem was gaining more recognition, ongoing suppression around Lightning Ridge was still required and infestations around Grawin-Glengarry-Sheepyards opal mining areas presented a significant problem, as identified by landholders, Glengarry Grawin Sheepyards Miners' Association (GGSMA) and other agencies. Western Catchment Management Authority (WCMA) contracted to NSW DPI a project to assess and recommend pest and weed management priorities for the Western Catchment. In September 2005, the final report for this project, recorded growing public concern about Hudson pear, and made a recommendation that the Weeds Officer, Walgett Shire Council and NSW DPI investigate the extent and practicability of eradicating *C. rosea* in the district (Braysher, M., 2005). CMCC submitted a WCMA funding application for Hudson pear control work (for 20,000 ha, though work over 60,000 ha). As a result, WCMA committed $100,000 for Hudson pear control work, with Walgett Shire and CMCC each contributing $40,000 to the project (Walgett Shire, 2006). Based on improved data, the local weeds authority had mapped the extent of Hudson pear core and known scattered infestations, and had prepared a five-year Hudson Pear Control Plan for Lightning Ridge and surrounding areas for 2001-2006. Walgett Shire Council reported with more accuracy for 2005-06 that there were five known medium-high density core infestations over 111 km^2 and scattered infestations over 458 km^2 (Walgett Shire Council 2006).

By late 2005, the extent of core and scattered infestations was becoming clearer and control work was becoming more organized and collaborative. However, the extent of Hudson pear in often rough terrain and thick vegetation together with the cost and labour-intensive nature of chemical control added to public perception that Hudson pear was too big a problem to successfully control, especially around Grawin-Glengarry. It was also at this time that GGSMA, prompted by the local significance of Hudson pear around the Grawin-Glengarry mining area, successfully applied for WCMA discretionary funding to assist in their work, and complement the funded CMCC work. Increasing awareness about Hudson pear amongst involved Government Agencies led to an inter-agency meeting in Dubbo on 13 October 2005 regarding the control of *C. rosea* in the key Walgett Shire infestation locations. An action from this meeting was to organize a public information meeting, with relevant agency representatives also invited.

THE HUDSON PEAR TASK FORCE

At the Lightning Ridge Miner's Board meeting in late 2005, the Hudson Pear Task Force was established to co-ordinate existing and future Hudson pear control work. This collaborative group of stakeholders

brought together representatives from Lightning Ridge Miners' Association and Glengarry Grawin Sheepyards Miners' Association, Castlereagh Macquarie County Council, NSW Department of Primary Industries (Weeds and Mineral Resources representatives), NSW Department of Natural Resources (later NSW Department of Lands), Walgett Shire Council, Walgett Rural Lands Protection Board, NSW Farmers Association and the Western Catchment Management Authority. A second group, the Hudson Pear Steering Committee was also established, with executive-level representatives from these stakeholder groups appointed with the charter of co-ordination and sourcing of funding for a future co-ordinated Hudson pear management program.

The Hudson Pear Task Force and Hudson Pear Steering Committee began regular three-monthly meetings early in 2006. The initial meetings were focused on developing a more detailed strategic management plan to co-ordinate control work and to assist with the funding application process; on combining stakeholder spatial data to improve mapping the extent of Hudson known pear infestations and control work; and on documenting the current involvement of the stakeholder groups to develop a more co-ordinated attack. The Hudson Pear Management Plan, a Weed Management Plan for 2006-2011 was officially adopted by the Hudson Pear Task Force in August 2006. CMCC and NSW DPI Weeds representatives developed the draft plan for endorsement. The Management Plan identified an aim and objectives, stakeholders, situation and case for funding, financial considerations, barriers and contingencies, objective actions, monitoring and review process and resources. As a result of more co-ordinated planning, further funding has been obtained.

The objectives of the Hudson Pear Management Plan outline the strategic approach that the Hudson Pear Task Force Representatives devised and collectively adopted. Basically, the approach adopted was to focus control work primarily on scattered infestations to keep buffer areas around core infestations clear and to stop scattered and isolated plants and prevent major infestation of adjacent floodplain areas, and also to keep roadways clear to prevent local and touring vehicles spreading Hudson pear. Treatment of core areas was considered to be a secondary priority, with containment of these areas the first priority for effective control and cost-effectiveness reasons. The Hudson Pear Management Plan also identified the importance of mapping core and scattered areas as they are found, the implementation of an ongoing multi-media public awareness campaign on Hudson pear and its control and the investigation of biological control opportunities. This direction assisted with funding applications and effective planning for the investment of available funding, such as granted to CMCC, LRMA, GGSMA and DPI.

Spatial data collected by CMCC, LRMA and GGSMA were identified as key resources for updating mapping of Hudson pear infestations and key control areas (eg. determining the extent of current infestations, strategic buffer zones, core infestations, roadways, watercourses and focus areas of active stakeholder groups). New infestations were recorded as they were found, in order to update mapping and illustrate current situations for meetings. NSW Department of Natural Resources (DNR) (later Department of Lands) undertook a survey of Western Division Walgett landholders regarding the incidence of Hudson pear on their properties. Due to the collaborative approach of the Hudson Pear Task Force, the group aimed to combine this data with CMCC inspection and reporting data. Some obstacles were encountered with this focus, such as privacy issues associated with the specific CMCC property inspection details, software incompatibility issues, continual discovery of new infestations and issues with different GPS settings. Despite some difficulties, the Hudson Pear Task Force co-ordinated mapping attempts resulted in CMCC data and LRMA and GGSMA data being collated by both DNR/ Department of Lands staff and CMCC staff to produce a series of useful map diagrams. The mapping assists with project reporting, strategic planning and improving understanding of the overall success of project work.

Co-ordination of Hudson pear control work, project funding and project support work has been facilitated by the regular Current Situation updates at meetings by each stakeholder group. Co-ordination has also been facilitated by the mapping effort and importantly, the development of the detailed Hudson Pear

Weed Management Plan. Improved awareness amongst stakeholder groups has helped with targeting of control work and avoidance of overlapping of work by stakeholder groups. It has also increased awareness of individual stakeholder groups such as LRMA and GGSMA; the availability of funding opportunities and project applications consistent with overall Hudson Pear Task Force priorities such as strategic targeting of buffer control zones and subsequent Hudson pear regrowth as second stage management and integration of public awareness efforts, monitoring programs, and other possible control methods such as physical removal of isolated and small regrowth plants.

Co-ordination of stakeholder groups also provides feedback and improves understanding of various stakeholder perspectives regarding Hudson pear management. Pooling of financial resources, on-ground control efforts, specialist skills and knowledge, and principal client audiences are also benefits of the collaborative approach. An example of this can be seen in the development of public awareness publications and documentary footage. A collaborative approach has proved to be an efficient way to increase public awareness and utilize skills in physical production of products, identification of key audiences and relevant information required, and the efficient dissemination of the material. It is worth noting that in November 2006, the Hudson Pear Task Force and Hudson Pear Steering Committee merged for reasons of efficiency, with the agreement of both groups. The new, strengthened Hudson Pear Task Force reflected the progress of the co-ordinated control program in management of on-ground works and strategic planning. Effective public awareness materials have included DPI Primefact and Weed Alert, identification posters and cards and the production of television advertising footage.

OUTLOOK

Substantial on-ground treatment efforts have produced encouraging results, with greater areas of the core infestations also able to be treated than was considered possible, and for less expense than anticipated. Since 2006, the investigation of biological control possibilities has been part of the Hudson Pear Task Force collaborative efforts. Led by NSW DPI experts, successful funding applications have enabled research to be undertaken overseas while nursery sites of healthy Hudson pear infestations have been fenced off around Lightning Ridge and the Grawin area in early preparation should the research be successful. The accurate identification of the pest species was important in the identification of a specific biocontrol agent. Currently, GGSMA, LRMA and CMCC and local landholder on-ground control and suppression work continue, with good working relationships developed, and scattered infestations continue to be found and treated. Effective rainfall over summer 2007/2008 has meant groundcover has affected visability but should help to compete with regrowth of Hudson pear. Pasture trials to investigate the use of pastures to compete with and suppress Hudson pear establishment and regrowth are being developed. Following the publication of printed material in 2006 and 2007, a television awareness program is imminent. A collaborative approach with CMCC and Queensland Government agencies has assisted with the identification and awareness of Hudson pear in South-East Queensland.

REFERENCES

Braysher, M. (2005). Final Report of the Western CMA Pest Animal and Weed Project. NSW Department of Primary Industries Vertebrate Pest Research Unit. September 2005.

Holtkamp, R. (2006). Hudson pear. Primefact 240, November 2006. NSW Department of Primary Industries.

Hosking, J.R., Conn, B.J., Lepschi, B.J. and Barker, C.H. (2007). Plant species first recognized as naturalized for 2002 and 2003, with additional comments on species recognized as naturalized in 2000-2001. Cunninghamia 10(1): 139-166.

Walgett Shire Council (2005). Comprehensive State of the Environment Report for the Year 2004-2005.

Walgett Shire Council (2006). Supplementary State of the Environment Report for the Year 2005-2006.