THE ROLE OF PEST CENTRAL IN DELINEATION AND CONTROL OF HUDSON PEAR, CENTRAL QUEENSLAND

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ABSTRACT

Biosecurity Queensland (Department of Agriculture, Fisheries and Forestry) became aware of Hudson pear infestations at Cracow in Central Queensland in 2011. Numerous treatment visits have been undertaken since then with a goal of eradication. Eradication is feasible given that from the outset, Pest Central has been consistently used to collect data on survey and treatment effort; and makes it possible to undertake delimitation of the infested area. Lessons learned from previous eradication programs are taken on board with this program.

INTRODUCTION

Hudson pear (*Cylindropunita rosea and C. tunicata*) is a class 1 declared pest plant in Queensland; it is considered to be a threat to humans and animals mainly because the spines can cause injuries; and if allowed to spread it can dominate understorey vegetation across diverse landscape types (State of Queensland 2012). Biosecurity Queensland commenced controlling Hudson pear in Cracow in 2011. After considerable consultation with the local community and based on several vehicle and on-foot surveys and surveillance work using Pest Central, Biosecurity Queensland considers that the infested area is restricted to the areas surrounding the township.

Background

At Cracow, the local landowners and the Banana Shire Local Government Officers had been treating what they called Cracow pear for 20 years. It was deemed to be a local problem and part of their environment. The existence of Hudson pear in Queensland was highlighted at the 10th Queensland Weed Symposium (Love 2009); subsequently Cracow pear was confirmed by Biosecurity Queensland in 2011 as *Cylindropunita tunicata*, or Hudson pear, a Class 1 weed.

The invasive potential of Hudson pear at Cracow is significant due the location of the town in the top end of the Fitzroy Catchment. Cracow was a thriving gold mining town from mid 1930s to the early 1970s. The town is surrounded by hilly timbered and partially cleared grazing blocks. As the town depopulated in the 1970s, the incidence of escaped ornamental plants increased, the worst of these being Hudson Pear. Anecdotal evidence suggests that it spread by animal movement, mainly attached to native marsupials, and that it persisted through the dry years of the 1980s and 1990s. The community of approximately 40 people are very aware of the human and livestock risks associated with the cactus and most people had some experience with control.

When the significance of the problem was identified in 2011, Biosecurity Queensland officers began contacting locals to gain an understanding of the weed extent, and to start

building a co-operative working relationship primarily to gain access to areas where the weed is present. They commenced a treatment regime and started recording survey and treatment activities using Pest Central. Pest Central is an internet-based mapping system that deploys field units for data collection, which link to a centralised 'cloud-based' database for data storage, sharing, management and analysis.

MATERIALS AND METHODS

To date we have visited the infestation site on seven occasions, from October 2011, to March 2013. We used survey length (on foot, in metres) as a measure of 'survey effort'; against the number of treatments undertaken. The eradication goal is to reduce 'treatment effort' to zero whilst maintaining consistent 'survey effort'.

Whilst conducting surveys and treatments, each officer carries a Personal Digital Assistant that has been installed with Pest Central mobile. Pest Central is activated at the start of each session, and GPS tracking is enabled; at the end of each session, tracking is stopped and the survey form is completed. The form includes attributes such as the weed species name, date, and the way the survey was carried out (on foot, by vehicle etc.).

When the target species is found, it is treated. The officer then records the treatment details in Pest Central. This is recorded as a point using the GPS location, and the attributes recorded include the name, date, and method (chemical or physical). The next record remembers the previous entry so that subsequent entries are not time-consuming. Survey data that had been conducted by vehicle was not included in this data analysis.

At the end of each site visit, the data is sent to the Pest Central 'cloud' database where it was accessed using the Pest Central Office application. We exported the data into ESRI software for more detailed analysis.

RESULTS

To May 2013, 130.2 km have been traversed on foot and 1,438 treatments have been recorded (Table 1). The first four visits were largely experimental treatment visits (using Metsulfuron which proved ineffective and then physical removal using salad tongs before the extent of the infestation was better understood).

Table 4. Survey length (m) and treatments per site visit.

Period	Total length (m)	No. Treatments (T)	T/m	% T/m
Oct-11 (1 day, 2 people)	2,252	29	0.0128774	1.288
Dec-11 (3 days, 1 person)	3,639	10	0.0027480	0.275
Apr-12 (2 days, 1 person)	2,619	4	0.0015273	0.153
Sep-12 (3 days, 5 people)	21,389	128	0.0059844	0.598
Nov-12 (5 days, 6 people)	48,313	355	0.0073479	0.735
Jan-13 (1 day, 1 person)	6,827	26	0.0038084	0.381
Mar-13 (3 days, 4 people)	45,162	886	0.0196183	1.962

The percentage treatment per metre of survey track has been plotted onto a time graph, shown in Figure 1. Figure 1 indicates that percentage treatment per surveyed metre is increasing (r^2 = 0.66). Whilst data collection was consistent, the parabolic curve may be

explained partly because different officers record treatment information differently, and because the purpose of each site visit changes (from primarily treatment work to community engagement work). The visits where the primary aim was to treat Hudson pear, are circled.

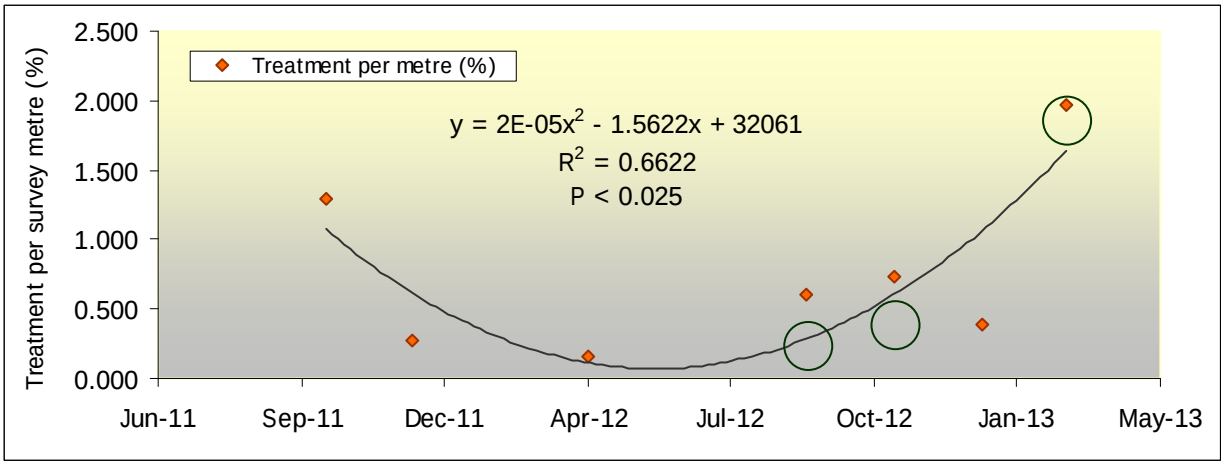
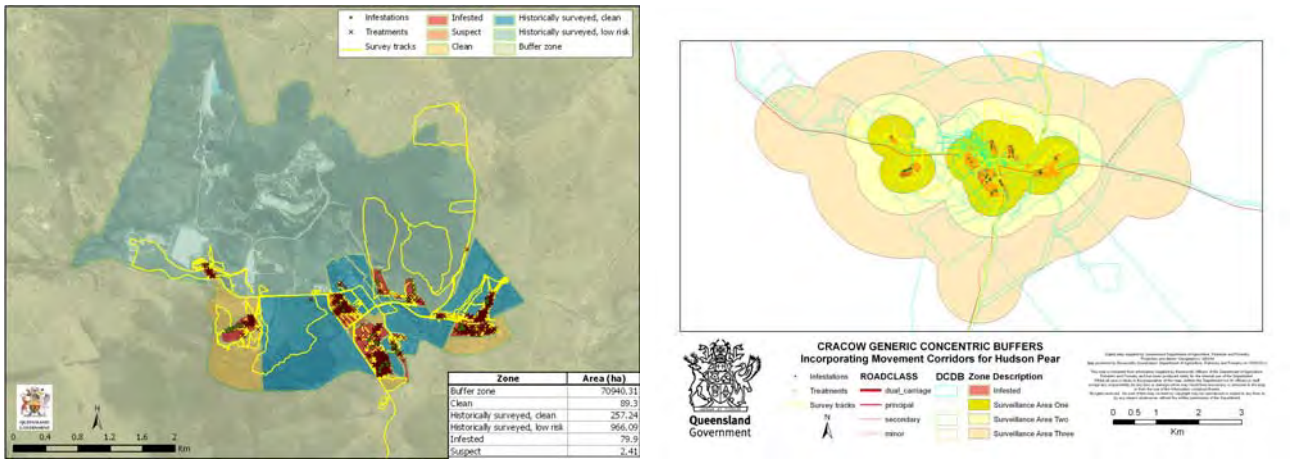


Figure 4: Graph showing the polynomial relationship trend between the percentage treatment per meter of survey track.

From the work that has been undertaken so far, a local strategy map (Figure 2a) was built using expert advice from local stakeholders. It identifies infested zones, clean zones, historically treated, low risk but unsurveyed zones and unsurveyed suspect zones. Figure 2b is a buffer zone that spatially identifies potential spread by animal movement.



Figures 5a, 2b: Strategy maps showing the different infestation zones surrounding Cracow, and the survey, treatment and infestations current to March 2013.

DISCUSSION

The data is showing that as more area is searched, more treatments are being undertaken (Figure 1). The curve will most likely continue upwards until the full extent of infested area is known; this is known as delimitation (Panetta and Lawes 2005). When the delimited area is reached then treatment effort should decrease in proportion to survey effort. If delimitation has not been clearly defined then discovery of another large, separate infestation site will cause proportional treatment effort to again increase. Jeffery (2012) stated that determining the full extent of an infestation is the most difficult part of an eradication program, yet this needs to be known early to determine whether or not eradication is feasible. We do not know yet whether the Cracow infested area has been

defined; as Hudson pear may have been introduced to the area as early as the 1950s, it is possible that undetected infestations exist further afield.

The strategy map (Figure 2a) spatially defines the desired management regime surrounding Cracow. This helps participants and stakeholders understand the process for moving towards eradication. Figure 2b defines the potential spread of Hudson pear outwards from known infestations by animal movement, and aids the survey and planning process.

A number of features about this program give us optimism; (i) Survey and treatment effort are routinely being recorded into Pest Central; (ii) We have consistent and reliable data over the progress of the campaign; (iii) The program has keen interest and active support from the Evolution Mining operation which is a major employer in the Cracow district; (iv) It has support from the local community as they have good knowledge of the plant, having treated it locally for many years; (iv) The plant does not spread by seed. Less positively, Hudson pear does spread easily by wildlife and humans because of the barbed spines.

The Cracow Hudson pear infestation is an eradication target and so far shows potential to reach that goal. Good delimitation is a major key to success and this will involve continued community involvement as well as continued consistent use of Pest Central to maintain data collection.

ACKNOWLEDGEMENTS

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