Department of Agriculture and Fisheries
Biosecurity Queensland

Flinders Shire

Good Neighbour Program

Case study

Completed as part of the War on Western Weeds initiative

SHIRE OF FLINDERS

Southern Gulf Catchments

Queensland Government

Background

The spread of prickly acacia (*Vachellia nilotica*) and other declared weeds across property boundaries creates new infestations, expands existing infestations and threatens the investments made by landholders to control their weeds. In some circumstances, this encroachment creates conflict between owners of adjoining properties, due to varying attitudes and control objectives.

The Flinders Shire Council developed a 'good neighbour' policy and program as part of the *Flinders Shire Council pest management plan: 2012–2016* to reduce potential conflict between landholders in regard to varied prickly acacia management aspirations and activities.

The Good Neighbour Program (GNP) includes key actions and procedures aimed at reducing the spread (prevention and containment) of pest plants impacting neighbours within the Flinders Shire local government area.

The development of weed-free property boundary protection zones was identified by Flinders Shire Council as one way of reducing spread. This is particularly relevant for prickly acacia, which is primarily moved by cattle.

Through their GNP, the council has opted for the establishment of weed-free protection zones. This boundary protection zone approach had not been implemented on a broad scale and the feasibility of establishing such buffers was untested. The War on Western Weeds project, a Department of Agriculture and Fisheries (DAF) initiative to improve prickly acacia management, provided an opportunity to undertake a pilot study of property boundary protection zone implementation.

The case study was co-led by DAF, Flinders Shire Council and Southern Gulf Catchments Ltd (SGC), in partnership with participating landholders.

Figure 1: Prickly acacia infestations on a boundary (right) are a threat to the neighbouring weed-free property (left)

Key elements of the GNP

The GNP is initially a voluntary program. Landholders can participate by signing a participation agreement that gives landholders ownership for containing the spread of weeds from property to property. Aimed initially at prickly acacia, the GNP will eventually apply to all pest management referred to in the Flinders Shire pest management plan. The key elements of the GNP are as follows:

1. Landholders agree to maintain a declared weed-free buffer zone that is a minimum of 10 m from boundaries, 10 m either side of the bank for 250 m upstream within defined watercourses from a boundary, and 10 m either side of gazetted roads, public access roads and powerlines. These buffer zones are to be reviewed annually.
2. All stock routes are to be kept free of declared weeds.
3. Landholders agree to provide a weed hygiene declaration for all stock leaving a property and request one for stock entering a property, and use best-practice measures to minimise the spread of weed seeds by livestock.
4. Landholders agree to participate in wild dog control programs, catchment group projects and funding applications.
5. Landholders agree to complete a property boundary management plan and commit to achieving its objectives.

Case study objectives

The principal aim of this case study was to assess the feasibility of establishing weed-free property boundary protection zones for a group of adjoining properties and use this information to further develop the GNP within Flinders Shire.

The objectives were to:

- assess the feasibility, costs and projected timeframes for establishment of boundary protection zones
- collate information on landholder perceptions before and after protection zone implementation
- collate information on best-practice options used and any obstacles to protection zone implementation
- compare the feasibility of establishing protection zones of different widths and in different situations (watercourses, varying weed density, native vegetation, etc.).

The case study focused on a group of 13 properties (comprising 7 businesses through aggregated property holdings) in Flinders Shire. These properties had different levels of weed infestation, control history and objectives, and varied owner–manager arrangements. The Flinders Highway was used as a northern boundary to the case study, meaning only parts of the Dunluce and Gunnerside boundaries were included. The total length of property boundaries (excluding common boundaries within aggregated holdings) was 430 km.

The case study area, which is predominantly Mitchell grass downs, has two major braided creek systems (Warianna and Walker creeks) in the east, Sloanes Creek and Eastern Creek in the west, plus other minor watercourses and multiple drainage lines. Cattle grazing is the dominant livestock enterprise. The area was subject to prolonged drought for the duration of the case study.

The case study commenced in mid 2014 and concluded in July 2015. Initial control operations occurred from September 2014 to February 2015, with follow-up control from February to July 2015.

‘Nobody wants weed seed going over their fence.’

Figure 2: Samantha Cullen (SGC) and Nathan March (DAF) surveying a property boundary

Mapping weeds on property boundaries and watercourses

The first step was to survey properties and develop maps to aid control planning. Surveys were conducted by a team comprising DAF, SGC and Flinders Shire Council personnel. Surveys focused on gathering data only within the proposed protection zone areas of 10 m from external boundary fences and 250 m upstream along watercourses. Where adjoining properties were managed as one farming unit, only the external boundaries were surveyed.

Data collected included weed species, maturity, density, location and extent (using GPS or PDAs). The published photo density standards (low, medium and high densities) for prickly acacia were used to ensure consistency. An additional 'scattered' category for individual plants and very sparse infestations (generally ‹10 plants per hectare) was also used.

Survey data was collated by SGC and represented on maps as infestation points and darker coloured lines representing higher densities. The presence of native vegetation was sometimes noted, but not recorded in detail. Since native vegetation may influence the use of control methods, this is an aspect that could be improved with future boundary surveys. Photographs were regularly taken to ensure survey consistency and provide a visual reminder of infestation density and surroundings.

Boundary weed surveys were fairly quick and easy, with all properties surveyed within one to two days—a total of 430 km was surveyed by two to four personnel in nine days. Prickly acacia was the dominant weed, with occasional small-scale infestations of parkinsonia (*Parkinsonia aculeata*) or mixed infestations of the two weeds. On some properties, the survey found a disproportionate number of prickly acacia seedlings and saplings as a result of high rainfall during 2010–2012. The resultant case study map of property boundary infestations is shown in Figure 4.

Figure 3: Before control work occurred, these prickly acacia seedlings had germinated in a creek from an upstream seed source.

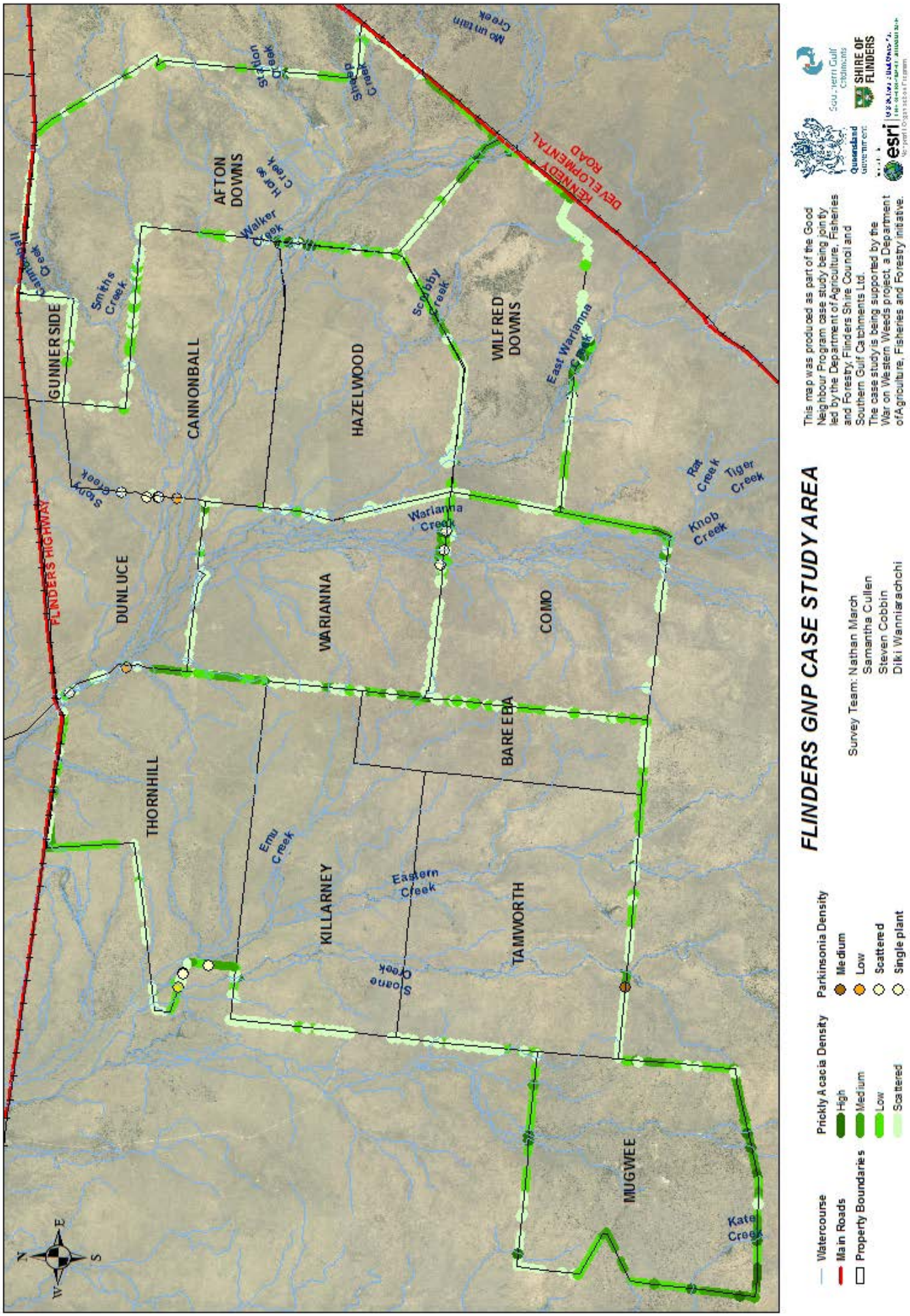

Figure 4: Property boundary weed distribution

Developing boundary weed management plans

Boundary weed management plans were developed to incorporate 12 of the 13 properties (requiring only 6 plans due to amalgamated holdings), using the template provided in the Flinders Shire pest management plan. The first component of each plan was an overview of the weed infestations. This comprised a table with rows for each boundary noting the weed species, infestation length (along fence lines) or area (within watercourses), density and any critical comments regarding spread risk or situation.

The second component of the plan was the control program, which noted the preferred control methods and estimated resources for each boundary. It is noted that such estimates are difficult to generate without significant weed control experience. Priorities were assigned to each boundary, with consideration given to the invasion threat that infestations posed to neighbouring properties. Appendixes included a property weed map, images of infestations and a control monitoring sheet.

Landholders generally found the format useful and informative, with the monitoring sheet providing a handy record of control efforts and resources. One property did not require a boundary weed management plan due to the scarcity of weeds and only very minor control requirements.

Participant attitudes

The GNP is essentially about changing attitudes and demonstrating that weeds, especially prickly acacia, can be prevented from spreading from property to property. Consequently, the case study focus was not only on control operations but also the attitudes of the participants.

Case study participants were surveyed to assess their perspectives of the GNP both before and after weed control on their boundaries (see Figure 6). Initial questions covered infestation levels, control history and aspirations before specifically addressing the GNP, including aspects associated with property boundary protection zones and the feasibility of these zones. Although there were widely varying infestation levels and aspirations between properties, some notable trends were identified.

At the outset of the case study, all participants rated the spread of weeds from their properties as a ‘slightly important’ to ‘critical’ issue. Most considered the spread of weeds to their property as ‘important’ to ‘critical’, although two considered it ‘unimportant’. The latter rating reflected high infestation levels already being present in one case, and an historically limited spread of prickly acacia from neighbours in the second case.

Figure 5: Team members checking they have the right equipment prior to start of work

Figure 6: Undertaking an attitudinal survey to gauge participant perspectives of the GNP

All landholders were supportive of the GNP concept and boundary weed management. All 'agreed' or 'strongly agreed' that the boundary protection zone widths outlined in the Flinders Shire pest management plan were feasible to establish and maintain. Additionally, all seven landholders believed that the minimum 10 m property boundary protection zone was a good starting point, with four saying it could be wider.

Most participants considered the 250 m watercourse property boundary protection zone to be 'spot on', with only two out of seven participants believing it should be wider. Although the case study was undertaken during drought, all participants were receptive and positive about the potential establishment and effectiveness of weed-free property boundary protection zones.

'People around my property are trying to eradicate prickly acacia so I need to try to stop it spreading downstream.'

Establishing property boundary protection zones

Best-practice control along fence lines

The protection zone for fence line property boundaries is a minimum width of 10 m. Infestation levels encountered during the case study varied greatly, and generally reflected invasion and/or control history. Highest densities were generally present in the vicinity of dams and other water points.

Best-practice control for prickly acacia and parkinsonia in fence-line situations includes herbicide, mechanical and aerial options. To reduce labour requirements, the use of tebuthiuron (Graslan® and Tebulan® were both used) as a soil-applied herbicide was the preferred control method, whether via quad bike, vehicle or walking. A review of monitoring sheets found that personnel in vehicles were often as efficient as those on quad bikes.

Figure 7: Soil-applied herbicide application using quad bikes

Basal bark spraying using Access® and diesel occurred within 100 m of watercourses and in proximity to native vegetation. While one property had successfully applied tebuthiuron aerially to about 13 km of boundary, there were few other infestations within the case study of sufficient density and length to justify further aerial control.

The application of tebuthiuron was mostly undertaken by small teams of two to four control operators. Larger teams were sometimes used, but tended to be less efficient unless they split into smaller teams to work on different boundaries. The control teams comprised various combinations of DAF, SGC and Flinders Shire Council personnel, contractors, landholders and others, depending on the property.

The Epple Skatter Gun (a compressed air-powered gun that shoots measured doses of tebuthiuron onto individual plants up to 20 m away from the point of application) was also trialled as part of the case study. This device was tractor-mounted and treated 93 km with 350 kg of tebuthiuron in 27 hours—an average treatment speed of 3.4 km per hour. The average cost over 93 km was $95/km, with the highest cost being $259/km in one high-density area. The Epple Skatter Gun was very efficient for medium- to high-density infestations on fence lines. Most property boundaries, excluding watercourses and areas of native vegetation, could be treated in a day or two using this method.

While the initial focus was on the establishment of a boundary protection zone of 10 m, the operational reality was that this width was commonly exceeded during the case study. If there were few weeds along a boundary, it became typical practice to venture 50 m or more into paddocks to treat isolated plants or small clumps. The maintenance of station tracks along the boundary contributed to the ease of widening the protection zones. Only seedlings and saplings were usually found on tracks, meaning efforts could be focused on wider areas without significantly increased labour time.

'Boundary protection zones ended up wider without much effort.'

Figure 8: The Epple Skatter Gun was fast and efficient for control of medium- to high-density infestations

Best-practice control within watercourses

The boundary protection zone for watercourses is a minimum 250 m on the upstream side of boundary fence lines and a minimum 10 m on the downstream side of boundary fence lines. The infestation levels encountered within watercourses varied greatly. Even within paddocks with high infestation levels, the associated creeks could have varied densities.

Best-practice control for prickly acacia and parkinsonia within watercourses, particularly in the presence of native vegetation, is largely restricted to basal bark spraying. Basal bark spraying is labour intensive, but usually results in high to very high kill rates. Thick bark on larger trees and debris around the base of trees may sometimes reduce kill rates if extra care is not taken. Due to poor seasonal conditions (moisture stress of plants) and the occasional mix of both prickly acacia and parkinsonia, Access® mixed with diesel was the preferred herbicide.

In some instances, mechanical pushing by dozer or loader can offer significant advantages and benefits. A 250 m section of high-density prickly acacia with no native vegetation was loader pushed on East Warianna Creek. Trees were pushed out and stacked outside of the creek for subsequent burning. Pushing has completely cleared the site and enabled easier monitoring and follow-up control than could otherwise occur had dead standing timber remained. The site has been incorporated into a research study to monitor regrowth and post-mechanical follow-up.

'My plan is to eventually eradicate prickly acacia so I don't want it coming back from upstream properties.'

Figure 9: Landholders and Flinders Shire Council personnel join forces to control a high-density infestation within a watercourse in the study area

Figure 10: Loader pushing within a watercourse provided benefits of easier monitoring and follow-up control

In total, about 28 km of infestations within watercourses were treated. In most circumstances, a spray team of two people was sufficient for low- to medium-density areas, but teams of four to six people were preferable for high-density prickly acacia within watercourses. Sometimes, additional drainage lines were treated if there was a risk of weed-seed spread and the neighbouring property was relatively weed-free.

For the most part, the treatment of a 250 m watercourse protection zone was often undertaken within a couple of hours. In a handful of situations, there was a requirement for more than eight hours labour and more than 200 L of herbicide–diesel mix for 250 m treatment zones.

Due to the complexity of watercourse systems (including their varying width and braiding), negligible meaningful data was collected on the resources required for individual situations. Future case studies could improve data collection specific to management of weeds within watercourses, but this would require additional detailed data collection of weed and watercourse information plus significant disruption to the control program to stop and assess diesel and herbicide usage. Since no two watercourses are the same, comparative data will be difficult to review.

Follow-up treatment

Depending on the situation, follow-up control utilised either basal bark spraying or soil-applied herbicides. It is expected that follow-up efforts will match and sometimes exceed that of initial control. However, due to ongoing drought within the case study area, regrowth and germination of weeds following initial control was often negligible to low. Follow-up control costs for all properties were only 23% of the initial control costs.

Significant numbers of seedlings were only found in a few sections of watercourses that had experienced flow from upstream rainfall. If higher densities of seedling germination was present, foliar spraying would have been considered. It is noted that the cost of establishment of boundary protection zones will be greatest in the first two to three years, with some level of maintenance required indefinitely to sustain their benefits.

Property-level analysis

Property boundaries ranged from 38 km to 123 km, with initial and follow-up control (where required) completed for all 430 km of boundaries. Boundary protection zone widths varied from 10 m to 50m, with the latter width usually achieved on properties with scattered to low-density infestations.

Labour has been costed at commercial contract rates for Macaroni Contractors Pty Ltd and DC Contracting, and not published for commercial in-confidence reasons. In-kind labour was costed at $45 per hour for time provided by DAF, SGC and Flinders Shire Council personnel, landholders and others. In doing so, the costs of all labour could be included or excluded for those considering their own boundary control programs.

For the purposes of analysis, herbicide costs have been calculated at full commercial rates. While the council was able to buy herbicides at highly discounted rates, it was thought that the use of these figures for analysis would be potentially misleading for those considering boundary management. Herbicide was costed at $16/kg for tebuthiuron, $81/L for Access® and $1.06/L for diesel.

Initial control requirements and costs

Labour (including contract machinery hours) required for initial control varied from 2 hours to 176 hours, with speed of application along all boundaries averaging 1.36 km per person per hour. Labour and contract machinery costs (excluding herbicides and diesel) for initial control varied from $90 to $11 030 per property or property aggregation. Herbicide and diesel costs varied from $9 to $9395, with the latter figure including aerial treatment costs.

Total costs (labour, machinery hire, herbicide and diesel) of initial control per property or property aggregation ranged from $99 to $17 473 (see Table 1). The average cost per kilometre of boundary protection zone treatment ranged from $2.45 (for a 50 m wide protection zone) to $345 (for a 20 m wide protection zone plus a 2 km watercourse treatment) where infestations were consistently medium to high density.

Table 1: Initial treatment costs for weed control associated with boundary protection zones, ordered from least to greatest boundary distance

Property	Boundary distance (km)	Estimated average protection zone treatment width (m)	Labour and contract machinery (hours)	Total cost of herbicides, diesel, labour and machinery ($)	Total cost excluding labour ($)	Average cost per km including labour ($/km)	Average cost per km excluding labour ($/km)
Como	38.8	50	54	4 228	1 798	109	46
Dunluce	40.53	50	2	99	9	2	0.22
Warianna	40.56	30	62.5	12 207	9 395	301	232
Wilfred Downs	43.98	20	176.46	15 181	4 151	345	94
Gunnerside properties	70.53	50	83	4 043	308	57	4
Afton Downs	72.17	20	64.41	5 527	2 397	77	33
Thornhill properties	123.69	20	146.43	17 473	8 918	141	71

Follow-up control requirements and costs

As previously noted, follow-up control requirements were very low and may have been significantly greater if better rainfall had occurred within the case study area. One property was not re-treated due to negligible seedlings, no known mature plants and the need for rainfall to activate previously applied tebuthiuron.

Labour required for follow-up varied from 0 hours to 60 hours, with costs of $0 to $2842 per property or property aggregation. Herbicide and diesel costs varied from $177 to $1469.

Total costs of follow-up per property or property aggregation ranged from $0 to $4311 (see Table 2). The average cost per kilometre of boundary protection zone follow-up treatment ranged from $0 (for a property aggregation needing no follow-up) to $50 (for a 20 m wide protection zone plus a 5.3 km watercourse treatment).

Table 2: Follow-up treatment costs for weed control associated with boundary protection zones

Property	Boundary distance (km)	Estimated average protection zone treatment width (m)	Labour and contract machinery (hours)	Total cost of herbicides, diesel, labour and machinery ($)	Total cost excluding labour ($)	Average cost per km including labour ($/km)	Average cost per km excluding labour ($/km)
Como	38.8	50	60	987	177	25	5
Dunluce	40.53	50	20	1 710	810	42	20
Warianna	40.56	30	26	1 473	305	36	8
Wilfred Downs	43.98	20	21	1 474	420	34	10
Gunnerside properties*	70.53	50	0	0	0	0	0
Afton Downs	72.17	20	49.89	3 643	1 150	50	16
Thornhill properties	123.69	20	56.5	4 311	1 469	35	12

* No follow-up control was deemed necessary for the Gunnerside properties

'The benefits are not just in weed control but reduced maintenance issues for tracks and fences.'

Overall control requirements and costs

Labour required for both initial and follow-up control varied from 22 hours to 203 hours (see Table 3).
Total costs for all labour, herbicide and machinery ranged from $819 for a property with a 40 km boundary to $21 791 for a property aggregation with a 123 km boundary plus a 4.9 km watercourse treatment. The labour requirement for establishment of boundary zones was much lower than anticipated.

When considering the figures below, it is important to realise that boundary protection zone widths varied from 20 m to 50 m, rather than the original target of 10 m. It is also important to note that such zones will require various levels of ongoing maintenance, regardless of the effectiveness of control to date.

Table 3: Total treatment (initial and follow-up) costs for weed control associated with boundary protection zones

Property	Boundary distance (km)	Estimated average protection zone treatment width (m)	Labour and contract machinery (hours)	Total cost of herbicides, diesel, labour and machinery ($)	Total cost excluding labour ($)	Average cost per km including labour ($/km)	Average cost per km excluding labour ($/km)
Como	38.8	50	72	7 489	4 249	134	51
Dunluce	40.53	50	22	1 809	819	44	20
Warianna	40.56	30	88.5	13 681	9 700	337	239
Wilfred Downs	43.98	20	197.46	16 655	4 571	379	104
Gunnerside properties	70.53	50	83	4 043	308	57	4
Afton Downs	72.17	20	114.3	9 170	3 546	127	49
Thornhill properties	123.69	20	203	21 791	10 282	176	83

'The whole program has shown that control of spread can be achieved with far less effort than originally thought.'

Initial costs of treatment for various densities

Analysis of control record sheets and field monitoring enabled initial control costs for 10 m wide property boundary protection zones to be calculated for different densities, control methods and vehicles (see Table 4).

These costs have been generated from sectional analysis of boundaries where there was a reasonably consistent density. There were no plant number counts for these sites—only a visual assessment of the density range.

Table 4: Examples of treatment costs for varying densities and control methods

Prickly acacia density	Data source	Cost per km for 10 m wide boundary weed treatment	Application method	Transport
Scattered	Dunluce	$2	Basal bark	Quads
Scattered	Como (part)	$3	Soil application	Vehicle
Scattered	Hazelwood	$4	Soil application	Quads and vehicle
Low	Como (part)	$9	Soil application	Vehicle
Low	Afton (part)	$26	Soil application	Vehicle
Low	Afton (part)	$29	Basal bark and soil application	Vehicle
Low	Wilfred (part)	$55	Soil application	Quads and vehicle
Medium	Afton (part)	$79	Basal bark and soil application	Vehicle
Medium to high	Mugwee (part)	$102	Epple Skatter Gun	Tractor
Medium to high	Mugwee (part)	$155	Epple Skatter Gun	Tractor
High	Warianna (part)	$166	Aerial soil application	Plane
High	Como (part)	$216	Basal bark and soil application	Walking
Very high	Mugwee (part)	$259	Epple Skatter Gun	Tractor

Post–case study participant attitudes

A post–case study attitudinal survey was completed with each landholder to assess changes in perspectives that may have occurred through their involvement and observations of mapping, planning and control operations.

Following the case study, all landholders still considered the spread of weeds onto their property as a 'slightly important' to 'critical' issue. Three of the seven properties thought the spread of weeds onto their property was more important following the study than at the outset, with none thinking it less important.

In regard to the minimum 10 m property boundary protection zone, all now 'strongly agreed' that this zone is feasible to maintain, including three landholders who initially 'agreed' rather than 'strongly agreed'. This was also the case when the same three landholders were asked about the feasibility of maintaining the 250 m watercourse protection zone.

There were mixed responses to whether the widths of boundary protection zones for fence lines and watercourses were appropriate, with four landholders stating these zones were 'spot on' and three believing they should be 'wider' or 'a lot wider'. None thought they should be narrower.

Property involvement in the GNP case study had some unexpected benefits—the overall weed management aspirations increased for five of seven landholders, with the other two already aiming to eradicate infestations. These aspirations included new goals associated with containment, boundary protection, control in some paddocks and/or management around watercourses.

'People will be more motivated if they can see they are getting a win out of it.'

Figure 11: Successful control of infestations within 10 meters of both sides of a boundary fence.

Discussion

Are the 10 m fence line boundary protection zones feasible and effective?

The Flinders Shire Council has specified 10 m as the minimum width of property boundary protection zones. Based on the case study control operations, this 10 m zone width is relatively quick, easy and inexpensive to achieve. Further, increasing the fence line zone width did not excessively increase costs or time requirements, and all properties within the case study established zones of 20 m or better.

Given that prickly acacia is primarily spread by stock movement and stock are largely contained by fences, this distance will totally eliminate browsing of pods by stock from adjoining properties and prevent pod fall from trees onto adjoining properties.

In some circumstances, there may be minor movement of seed pods by wind (e.g. willy-willies) and water (sheet movement of water from high rainfall events). While no formal studies have yet been undertaken into these aspects, it is expected that 10 m provides high to very high protection from invasion by prickly acacia.

In summary, the minimum 10 m zone seems fair and reasonable, but could be wider to provide more protection from seed movement. It is noted, however, that the minimum 10 m distance for boundary fence lines may not provide adequate protection from some weed species for which dispersal factors other than livestock are more important.

'10 m is achievable and would motivate people to go wider.'

Are the 250 m watercourse boundary protection zones feasible and effective?

The Flinders Shire Council has specified 250 m as the minimum distance of watercourse boundary protection zones upstream of a boundary. Since the effectiveness of this zone length had not previously been assessed, research was conducted by DAF and SGC to assess the potential movement of prickly acacia pods in watercourses.

While seeds have no buoyancy, studies found that pods could float for up to 12 days in agitated water (average of 5 days). Three creeks within the case study were surveyed and seedlings were found up to 15 km downstream from a seed source. However, for the three creeks studied, 31% to 61% of seedlings occurred in the first 250 m of the prickly acacia seed source. These proportions may vary depending on the characteristics of the watercourse and other factors.

In terms of resourcing, all watercourse boundary protection zones were established with varying requirements—from negligible to moderate effort and costs. Most required only a small team of control personnel and initial control of no more than 8 hours labour. Follow-up control requirements were minimal, but likely to be significantly greater in better seasonal conditions.

In summary, studies have found that 250 m will not prevent the spread of all prickly acacia seeds between properties, but will reduce a moderate proportion. Increasing the watercourse protection zone lengths will achieve greater reductions in seed pod movement, but may require significantly greater effort. For example, to achieve a 75% reduction in seed pod movement may require a protection zone of 0.5 km to 3.7 km. It is likely that extending the watercourse protection zones beyond 250 m will deter some properties due to effort, cost and maintenance issues.

It is noted, however, that the minimum 250 m distance for boundary watercourses may not be suitable for other weed species that are not readily dispersed by water.

'250 m buffer zones are a good start as a minimum that can be built on as further measurements and research on seed movement helps determine ultimate buffer widths.'

Figure 12: Basal bark control in a creek line was enhanced through good teamwork from the landholder, DAF and SGC staff.

Benefits

The establishment of property boundary protection zones is one of the key elements of the Flinders Shire Council GNP. Given the intention to reduce the spread of weed seed between properties, this case study demonstrated that boundary zones are effective.

The benefits of property boundary protection zones included:

- facilitating an immediate reduction in weed-seed movement between properties
- providing an incentive for landholders whose properties are weed-free or who are aiming to progress their properties or some paddocks to weed-free status
- transferring most of the burden of weed management back to the owner of the property producing the weed seed, rather than adjoining property owners
- increasing the aspirations of landholders to manage weeds, even in drought conditions
- exposing landholders to new control methods and providing real data on likely costs.

The greatest benefit was achieved when one or both adjoining properties aimed to reduce their infestations.

It is acknowledged that minor benefits occur when both adjoining properties are heavily infested. In such circumstances the impacts of weed-seed spread are low, at least until one or both landholders change their weed management aspirations.

Figure 13: Aerially applied herbicides have helped reduce the threat of prickly acacia invasion from the property on the right.

Conclusion

This case study demonstrated that the establishment of property boundary protection zones for weed management is relatively quick, easy and of low to moderate cost. The minimum 10 m zone for fence line zones is feasible and, based on landholder participant feedback, there may be scope to widen this distance over time. The establishment of 250 m watercourse zones required greater resources, but all landholders considered this to be feasible to establish and maintain.

The boundary protection zone approach was fully supported by landholders participating in the case study. It is highly likely these zones will significantly reduce the spread of prickly acacia and other weeds. The GNP will not only assist individual properties, but will also complement the objectives of the Flinders Shire pest management plan and regional aspirations for weed management.

'This initiative allows people with clean properties to live beside infested properties with a lot less stress.'

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