

**Mesquite National Strategic Plan
Progress Review
2008 – 2009**



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on behalf of the **National Prickle Bush Management Group**
and its partner agencies and organisations

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Executive summary

Mesquite (*Prosopis* spp.) is the greatest weed threat to the arid and semi-arid rangelands of Australia. Infestations cover more than 1 million ha and threaten 76% of the mainland. A Mesquite National Strategic Plan has been developed with implementation overseen by the National Prickle Bush Management Group (NPBMG). Efforts have recently focused on coordination, strategic control, containment of core infestations, refinement of best practice, spread prevention and strategic plan redevelopment. This report outlines the key achievements and progress made during 2008–09.

Mesquite has the broadest geographic spread of all the Weeds of National Significance (WONS), so coordination and collaborative partnerships have been integral for successful management. Coordination has been measurably strengthened through meetings of the NPBMG, while regional natural resource management (NRM) groups now either lead or participate in actions across all eight of Australia's major mesquite regions. Collaborative partnerships have continued within and between Western Australia, Northern Territory, South Australia, New South Wales and Queensland.

The vision to eventually eradicate mesquite from Australia has been boosted by effective strategic control of over 100,000 ha. Broad-scale regional approaches to control are occurring in western New South Wales; Arid Lands (South Australia); the Pilbara, Kimberley and Gascoyne regions (Western Australia); the Barkly region (Northern Territory) and western Queensland.

Containment was achieved at two core infestations, with a revised goal of strategic control, for both the Bulloo River (Quilpie) and McKinlay River areas in Queensland. A combined infestation area of over 300,000 ha has effectively been brought under control at these two sites.

Management actions associated with the core infestation areas at Hughenden (Queensland) and the Pilbara (Western Australia) have accelerated. Use of integrated control that incorporates machinery, fire and herbicides is increasing in the Hughenden area where a 1600 ha area was recently mechanically treated. In the Pilbara there has been an emphasis on containment, with 75,000 ha of non-core infestation treated and regional and state management plans developed.

Years of research on varied aspects of mesquite ecology and control have more recently been collated with publication in the Australian Weed Series. Trials and field monitoring associated with mechanical control trials, post-wet season seedling emergence, and impact of the biological control agent (*Evippe* spp.) are continuing.

National, state, territory and regional awareness programs have increased awareness of the threat of mesquite with high levels of awareness in key parts of Australia. Two major articles featured in *Frontier* and *Outback* magazines. Additionally, increasing landholder adherence to weed hygiene protocols is potentially reducing the rate of spread.

The Mesquite National Strategic Plan review is nearing completion and will provide future direction for the management of mesquite in Australia. Ongoing collaboration and coordination at many levels will be required to maintain the outcomes and momentum achieved so far.

Introduction

The aim of this report is to outline progress made during 2008–09 to achieve the vision and goals of the Mesquite National Strategic Plan. The report is based on an evaluation of national actions and achievements and includes a discussion of current challenges and future priorities.

History and impact of mesquite in Australia

Mesquite is the common name of plants in the genus *Prosopis* that are present as weeds in Australia. The four main species are *P. pallida*, *P. velutina*, *P. glandulosa* and a hybrid species complex (*Prosopis* spp. hybrid). Mesquite species are usually differentiated by their form (either a multi-stemmed shrub or single-stemmed tree) as well as other botanical characteristics (e.g. leaf shape).

Native to North, Central and South America, mesquite has been recognised as a Weed of National Significance (WONS) due to its ability to invade natural landscapes, reduce agricultural production and impact on biodiversity. First introduced in the late 1800s, the distribution of mesquite has been influenced by deliberate historical plantings associated with pastoral properties, rural townships and occasionally with mining activity.

Mesquite now occurs over more than 1 million ha with infestations in New South Wales, Queensland, the Northern Territory, Western Australia and South Australia. Core infestation areas remain in the Pilbara region of Western Australia and at Hughenden in north-western Queensland.

The current distribution of mesquite remains low considering it has the potential to invade 76% of the Australian mainland. The arid and semi-arid rangelands are particularly threatened by mesquite and there are major challenges to combating this weed in remote regions.

A national solution

To address the problem, the National Mesquite Strategic Plan was developed in 2001. The long-term vision of this plan is that 'mesquite species and hybrids are confined and eventually eradicated from Australia'. The following four goals have been actively progressed to achieve this vision:

1. coordinate management
2. reduce the impact
3. eradicate
4. prevent spread.

National coordination commenced in December 2001 with the formation of the National Prickle Bush Management Group (NPBMG). This group, comprising representatives from Queensland, Northern Territory, Western Australia, New South Wales and South Australia, oversees implementation of the national strategies for mesquite, parkinsonia and prickly acacia. A full-time National Coordinator has been employed since April 2002.

During 2008–09 major new initiatives occurred addressing national awareness, strategic control, containment, research, mapping and coordination efforts. Regional initiatives, including the regional Get Rid of Mesquite program in north-western Queensland, have complemented national, state and territory actions.

Progress to date

Between 2001 and 2008, significant progress has been made at regional, state, territory and national levels. Major successes include:

- A National Research Workshop was held for the first time in 2002 and contributed to the publication of the national mesquite best practice manual in 2003.
- A National Mesquite Mapping Workshop led to an agreement of mapping standards and national map production. Photo-density standards have also been published for mesquite.
- Developed criteria for core infestation status and agreed on the initial four national sites meeting these criteria—Quilpie, McKinlay, Hughenden and the Pilbara.
- Successful progressive reduction of mesquite density and extent at McKinlay and Quilpie led to a stage where core infestation status was removed and strategic control became the primary goal.
- Partially contained and reduced core mesquite infestations at Hughenden (Queensland) and the Pilbara (Western Australia).
- Successful community-based strategic control at about 150 sites across Australia led to the management of infestations totalling over 500,000 ha.
- Developed a National Communication and Extension Plan to highlight key messages to stakeholder target groups.
- Published national extension products to promote awareness and early detection. These directly led to the discovery of many nationally strategic infestations.
- The promotion and adoption of best practice has been facilitated through field days, field tours and presentations.
- Researched and refined best practice management methods for hybrid mesquite, including trials using fire and machinery.
- Increased use of weed spread prevention protocols, including stock hygiene practices.
- Used landscape modelling in the Pilbara to identify areas most at risk of invasion.
- The impact of the leaf-tying biological control agent, *Evippe* spp., has been significant in some regions and has greatly reduced flowering and pod production.
- Qualified, through research, the role of feral pigs as a vector in seed spread and management implications.
- Regional natural resource management (NRM) groups increased their planning and involvement, especially Southern Gulf Catchments Ltd, Desert Channels Queensland Inc, South West NRM, Burnett Mary NRM, Lower Murray Darling Catchment Management Authority (CMA), Western CMA, Western Australia Rangelands NRM and Northern Territory NRM Board.
- All key states and territories were actively involved in implementing the national strategic plan. The New South Wales Prickle Bush Working Group was formed to facilitate action in that state.
- The National Coordinator and NPBMG Chairperson and members continued to provide leadership.
- Developed the National Priority Action Framework to guide stakeholders managing mesquite.
- Collated national achievements and developed revised actions through the National Strategy Review Workshops of 2006 and 2008.

Performance against strategic plan

Strategy 2.1: Coordinate management

Desired outcome: Mesquite management is coordinated and maintained at a national level

The coordination of mesquite management has enabled an increased efficiency and effectiveness of efforts across the geographic range of the weed. Key areas of focus during the reporting period included:

- effective national management
- collaborative partnerships and coordination
- education and awareness
- legislative support.

Effective national management

Formed in December 2001, the NPBMG remains the key driver for the implementation of the Mesquite National Strategic Plan. Coordination occurs through a concurrent process with two other WONS (parkinsonia and prickly acacia), which threaten similar geographic areas of Australia. Active support to the NPBMG has continued through agency and community representatives from Queensland, Northern Territory, Western Australia, New South Wales and South Australia. Regular liaison occurs with agency officers in Victoria.

A key action of the group in 2008–09 was the National Strategy Review Workshop held in Broken Hill. The workshop included an update of state and territory achievements, research outcomes and direction, case studies and review of strategy implementation. Two Australian Weeds Committee (AWC) representatives and the National Weeds Facilitator led the review process with outcomes to be made available by the end of 2009.

The NPBMG also held three teleconferences during 2008–09 to progress various aspects of strategy implementation and to address a range of issues. Two key changes to membership included formal acceptance of Mark Tarrant as the new Northern Territory Natural Resources, Environment, The Arts and Sport (NRETAS) representative and the resignation of Damian Collopy as a Western Australia Department of Agriculture and Food (DAF) representative.

During 2008–09, the NPBMG has continued to ensure a national network exists for improved collaboration at all levels, sharing of best practice knowledge and progressing strategic actions. In particular, the Chairperson participated in key events such as the WONS Chairs meetings.

Collaborative partnerships and coordination

In addition to the efforts of the NPBMG, collaborative partnerships and coordination are helping manage mesquite across states, territories and regions. Of note is the New South Wales Prickle Bush Working Group, a collaborative partnership involving multiple agencies, regional CMAs and local councils, which is now in its fourth year of implementing a state action plan for mesquite. Complementary to the group's efforts, the Western and Lower Murray CMAs have a funding-based partnership to control mesquite in the western part of the state.

Strong state-based coordination is also occurring in Western Australia (linking actions between the Gascoyne–Murchison, Pilbara and Kimberley regions), the Northern Territory

(linking actions in the Victoria River District and Katherine, Barkly and Alice Springs regions) and South Australia (coordinating work within the Arid Lands region).

In Queensland, where there are a large number of sites, the new Get Rid of Mesquite program in north-western Queensland aims to develop and implement a regional-scale best practice model for controlling infestations in peri-urban and rangeland situations. The initiative is led by a joint agency, local government and community committee.

Regional coordination is very strong within and between Southern Gulf Catchments Ltd, Desert Channels Queensland Inc and South West NRM. In south-western Queensland a strong collaborative effort is continuing between Queensland Primary Industries and Fisheries (part of the Department of Employment, Economic Development and Innovation), local government, South West NRM and landholders to manage the remaining infestations in that area. Collaboration and coordination is generally site-specific in other areas of Queensland.

Education and awareness

The national education program continued with an emphasis on threat awareness and increasing identification skills. The campaign uses the Prickle Bush WONS National Communication and Extension Plan as a framework for delivering key messages to identified stakeholders.

Products distributed included the existing national product series (brochures, posters, display banners and national case studies manuals) but also state- and territory-based fact sheets. The national mesquite awareness product range has been redeveloped but had not been reprinted at time of reporting.

Due to its successful use as an identification tool, another 100 acrylic prickle bush seed pod mounts were produced and are being distributed to key regions, including the Arid Lands region (South Australia) and the Pilbara and Kimberley regions (Western Australia).

Media articles, newsletter items and radio interviews were undertaken in support of awareness goals. In particular, major articles have appeared in *Frontier* (published by Meat and Livestock Australia) and *Outback* magazine. These magazines reach high numbers of the rural rangelands audience.

Workshops, field days and show displays

Awareness of the threat and identification of mesquite was featured during local and regional field days, workshops and shows. Key events included:

- Mesquite Field Day in the Longreach (Queensland) area—attended by 32 participants.
- Rural Lands Officers Group meeting at Winton Queensland—presentation of mesquite threat and best practice management
- Gulf Catchments Pest Task Force meeting at Richmond (Queensland)—presentation of the Get Rid of Mesquite initiative and regional priorities
- Weed Spotter Workshops (16) held in the Desert Channels region of Queensland—capacity building exercises to assist early detection.

Monitoring and evaluation

Monitoring and evaluation is primarily undertaken through various project management processes, including national reporting. In addition, some regional groups (such as the

Pilbara Mesquite Management Committee, Desert Channels Queensland Inc and Southern Gulf Catchments Ltd) have well-developed evaluation frameworks, including project databases supported by photo monitoring sites and GPS data recording.

A regional-scale telephone survey was undertaken in June 2009 involving graziers of four western Queensland shires. The survey comprised 100 properties. It found that 93% of graziers are aware of mesquite, 86% are extremely confident identifying the weed and 13% are not confident identifying the weed. As two of the core infestation areas (Hughenden and McKinlay) occur within the area surveyed, it was expected that awareness would be high. Awareness of mesquite in other key regions has not been assessed, and is likely to be highly variable and perhaps poor in some areas.

The performance indicators used within the National Mesquite Strategic Plan have never been adequately assessed due to deficiencies identified by the NPBMG when the plan's implementation began. Also, due to the number of stakeholders involved, there have been difficulties obtaining nationally relevant and consistent data across mesquite's full geographic range.

Legislative support

Mesquite is declared in every state and territory in Australia and there are no major legislative gaps. Current state and territory policy provides a further basis for the management of mesquite. The level of legislative enforcement is currently non-existent, although this is in part due to high voluntary compliance and control activity in many infestation areas.

However, the role of compliance in post-project management and in the management of very low-level occurrences of mesquite (e.g. isolated individual trees or clumps) requires consideration.

Strategy 2.2: Reduce the impact

Desired outcome: All core infestations are contained and subject to long-term management planning with a view to eradication over time

The NPBMG determined the criteria for core infestations in July 2003 with four core areas originally identified—Hughenden, McKinlay, Quilpie (Queensland) and the Pilbara (Western Australia). In a major achievement, two of these infestations have been reduced to a level of strategic control, while the containment of the other two areas is still being progressed. The current status and key actions associated with these infestations is as follows:

Quilpie core infestation

The infestation of *P. velutina* was reclassified from a core (containment) infestation to non-core (strategic control) infestation in mid-2007. At its full extent, the infestation covered an area of up to 300,000 ha including 4000 ha of medium to high density. There are now no areas of medium to high density, with only isolated seedlings and juvenile plants present.

The Queensland Government Pest Offensive program has provided financial support for follow-up control. During the past year, stakeholders have continued the control of regrowth. Queensland Primary Industries and Fisheries have been collaborating with Quilpie Shire Council to facilitate local government and landholder commitment.

The achievements at Quilpie are the result of sustained control efforts over more than 25 years with an intensified effort over the past eight years. State and federal government, Quilpie Shire Council and local stakeholders have invested a minimum of \$5 million. The final outcome is the elimination of the threat of mesquite to the agricultural and environmental values of the Bulloo River catchment (74,900 km²).

McKinlay River core infestation

The McKinlay River catchment infestation of *Prosopis* spp. hybrid and *P. pallida* encompassed over 100,000 ha, with 10,000 ha originally classed as high density. Control was initiated in the mid-1990s, with investment to date of approximately \$1.5 million. The bulk of the infestation has largely been brought under control through state, federal, regional NRM group and local government programs involving various stakeholders.

Contract spraying of the infestation over six properties has continued through the support of \$136,510 provided through the Australian Government's Defeating the Weed Menace program and \$240,000 (investment total over 2006–09) provided through the Queensland Government's Pest Offensive initiative .

These programs are currently being led by McKinlay Shire Council with support from Southern Gulf Catchments Ltd and Queensland Primary Industries and Fisheries. Landholder in-kind contributions and commitment is significant. Stakeholder meetings have been held to review and plan actions. Regular inspections are also undertaken to review on-ground control outcomes.

The infestation now consists of less than 1000 ha of medium density clumps primarily associated with the McKinlay River and sparsely distributed plants over the original 100,000 ha. Historical plantings of amenity trees associated with McKinlay township are yet to be fully addressed.

The effective management of the remaining medium density infestations is now feasible in the short term, with follow-up control required over at least the next 10 years. Moderate external resourcing will be required to assist with follow-up control.

Hughenden core infestation

Infestations of *P. pallida* occur over a 20,000 ha area associated with Hughenden township and the upper Flinders River. Originally, an area of at least 4000 ha was classed as high density. The large number of small landholdings, the prevalence of other priority weeds, and legislative requirements (related to vegetation management and watercourses) add to the complexity of managing the infestation.

Southern Gulf Catchments Ltd, with Flinders Shire Council support, has facilitated landholder control over the past year, with the involvement of 11 properties along Flinders River and Galah Creek. The total area treated is unknown, although one property alone mechanically cleared 1600 ha of high density infestation. These achievements complement work undertaken since the mid-1990s.

The level of control activity has increased in the past 12 months and the adoption of best practice has improved, with mechanical clearing, fire and herbicides used for maximum benefit.

While containment remains the primary aim, a progressive reduction of density and extent is achievable at Hughenden. To progress this aim, there is a need for further containment planning, including the development of updated infestation (density and extent) maps.



Figure 1. Chain pulling of mesquite in the Hughenden area has proved effective for large dense stands. (Image: Charles Curry, Southern Gulf Catchments Ltd)

Pilbara core infestation

The infestation of mesquite in the Pilbara is Australia's worst and is comprised primarily of *Prosopis* spp. hybrid but also some *P. pallida*. The infestation comprises about 220,000 ha, including about 30,000 ha classed as high density. About 150,000 ha of infestation occurs on Mardie Station alone.

The priority goals for the Pilbara infestation are:

- Contain the core infestation.
- Progressively reduce the outlier infestations.
- Continue development of best practice control and management methodologies.

The Pilbara Mesquite Management Committee oversees management of the infestation, which Project Manager Linda Anderson coordinates. The Pilbara Mesquite Management Committee involves a range of stakeholders, including landholders, government agencies and industry. During 2008–09 significant actions were undertaken, including:

- Controlled mesquite infestations totalling 75,000 ha outside of the core infestation to assist with containment goals. Some of the area treated included follow-up from previous programs. The control work is complementary to the containment fencing already in place on Mardie Station and landholders are contributing a minimum \$1.50 for every dollar of external funds invested.
- Planning to expand the successful blade plough trials a further 30–50 ha.
- Developed of a mesquite management strategy for Western Australia with a focus on containment of the Pilbara infestation and strategic management of outliers in the Pilbara, Gascoyne and Kimberley regions.
- Individual weed management plans are being developed for key Pilbara properties.

Support for control of the infestation has come from the Western Australia Rangelands NRM group, which has contributed base funding of about \$250,000 over the past 12

months (in addition to \$150,000 in 2007–08). This support also included capacity building training for the Project Manager.



Figure 2. Blade plough trials in the Pilbara showing pasture regeneration (Image: Linda Anderson, Pilbara Mesquite Management Committee)

Complementary research

To complement on-ground actions, research associated with the Pilbara mesquite infestation has been undertaken regarding ecology and best practice management methodologies.

The research has been led by CSIRO, with major on-ground support and monitoring by the Pilbara Mesquite Management Committee Project Manager. During the financial year, a number of research articles and reports have also been produced based on data collected over a number of years (Appendix 4). Key research outcomes and/or implications are as follows:

- **remote sensing trial**—Digital multispectral imagery was trialled but was not useful as there was too much interference with other vegetation, including eucalypts and *Acacia* species.
- **aerial survey comparison with remote sensing**—Demonstrated that aerial surveys are better for identifying isolated plants and low density infestations but are not overly accurate for density counts.
- **analysis of aerial photographs from 1970 to 2001**—Showed that mesquite plants generally were widely dispersed in 1970; gaps between plants were filled through to 2001.
- **development of a Pilbara mesquite suitability map**—Demonstrated that if mesquite was to get into further river systems it would dominate these riparian areas.

- **impacts of the biological control agent (*Evippe* sp.)**—Establishment is evident across most regions but impacts appear greatest in the Pilbara.
- **ecological studies**—Seed bank levels were found to be relatively low (10–100 seeds/m²) under mesquite trees although the research primarily occurred in low rainfall years. Higher numbers are found around water points, while low seed densities generally occur across paddocks. While seed bank levels can be low, very high densities of seedlings and juvenile plants can occur and persist under mature mesquite and native vegetation. Under mature mesquite plants in the Pilbara (4859 plants/ha) were found to be 10,914 seedlings and juvenile plants per hectare. Such numbers of young plants creates a management challenge for both initial and follow-up control.
- **recruitment**—Similar to other ‘woody weeds’, mesquite appears to be episodic with rapid establishment during a series of high rainfall years. The management implication is that control programs should make the most of the drier years.
- **integrated trial**—Fire was found to be effective against hybrid mesquite only when conditions create an extremely hot fire, so the application is limited by fuel availability and risk management considerations. Blade plough trials were very successful with kill rates of up to 99%.

Strategy 2.3: Eradicate

Desired outcome: All isolated and scattered infestations are eradicated

Mesquite has only invaded a small proportion of the area susceptible to invasion and many current infestations are relatively minor. Consequently, the eradication of mesquite is a priority on-ground action and is feasible at a large number of sites within the short to medium term. During 2008–09 strategic control occurred at many sites primarily for eradication purposes but also in support of containment goals.

New South Wales

The major action of the past year has been the finalisation of the Defeating the Weed Menace (DWM) funded project ‘Eradication of Category 1 Weeds of National Significance in Western New South Wales’ (\$614,390) involving the Lower Murray Darling and Western CMAs. In addition, an Enviro Trust project involving six properties has also been undertaken near Broken Hill.

During 2008–09 a total of 31,448 mesquite plants were treated via these two projects, bringing the total since 2006 to 215,784 plants. Twenty-six properties totaling 727,685 ha (232,006 ha in the Lower Murray Darling CMA and 495,679 ha in the Western CMA) were involved in the control program.

As part of the DWM project, capacity building has occurred through GPS training of contractors and consequent logging of sites as future reference points. All known infestations of mesquite in the two CMAs have now been mapped at a property level. However, the full extent of mesquite remains unknown as there have been limited surveys of other properties.

Also, the Broken Hill City Council has, over the last four years, sprayed its entire common and regeneration areas. Some of these areas contained some of the region’s original mesquite infestations. The council will continue to treat all mesquite on its land. The former Broken Hill Rural Lands Protection played a major role by facilitating the organisation of contractors, chemicals and diesel as needed. In earlier programs they also managed a

government subsidy payment program for landholders who carried out mesquite control on their land.



Figure 3. NPBMG and New South Wales Prickle Bush Working Group members conducted a field tour to inspect mesquite infestations and landholder control achievements south of Broken Hill.

Funding has been provided to the Lands Department (formerly Western Lands) to employ a noxious weeds inspector in far-western New South Wales (Unincorporated Area). This inspection program currently has mesquite as its highest priority.

In other parts of New South Wales, most infestations have been brought under control including those in Bourke Shire, Castlereigh-Macquarie County Council and the Riverina region.

The 2008–09 work complements the ongoing state action plan being addressed by the New South Wales Prickle Bush Working Group. In addition, the New South Wales Government has recently adopted the New South Wales Invasive Species Plan 2008-2015. This plan makes the prevention of new invasive species establishing the highest priority followed by the control/eradication of rare and isolated invasive species. Weeds such as mesquite will, consequently, receive high priority.

The effective management of all known infestations in New South Wales remains feasible in the medium term. The commitment to follow-up control and the maintenance of landholder motivation will be necessary to ensure investments to date are protected.

South Australia

Infestations of mesquite in South Australia are isolated and of a low density. The threat of mesquite has been significantly reduced through coordinated action over the past six years. The current focus is on follow-up control of known sites and 'search and destroy' of priority areas.

Recent key outcomes include:

- Lake Torrens—A property was surveyed and of 42 plants previously treated, 15 required follow-up control by basal bark spraying. A further four plants were found and treated.
- Woomera—The site has been previously treated (2005–07) with approximately 150 mesquite (and two parkinsonia) plants found and treated around the township and on the surrounding station. Some of the follow-up treatment has been inconsistent in recent years, with an estimated 12–20 plants regrowing. This site was inspected by the Kingoonya NRM group and noted as an area of high concern. The NRM field officer is to liaise with the relevant contractor and with personnel responsible for the Department of Defence's weed control strategy.
- Northern and York region—Ongoing monitoring of individual plants is occurring in the region.

To complement the on-ground control achievements and better monitor infestations, a prickly bush register has been developed and is in operation. The register keeps a record of location, density and site management history.

The effective management of most known infestations in South Australia is occurring, with eradication feasible in the medium term.

Northern Territory

Mesquite is found on 11 properties in the Northern Territory with most on the Barkly Tableland. All are small scale and generally of low density. Some sites were locally dense prior to treatment.

All known infestations of mesquite in the Barkly, Katherine and Top End regions have been treated and are under a monitoring program. This includes a new infestation found in association with the Georgina River in the southern section of the Barkly region.¹ Control of mesquite has been strongly coordinated by NRTEAS officers and in the Barkly by the Barkly Landcare and Conservation Association project Eradicating prickly acacia & mesquite on the Barkly Tablelands (CfoC funding of \$30,000 with in kind \$30,800).

In the Alice Springs region, mesquite occurrences are restricted to four sites. Three of these sites were controlled in 2002 with the remaining site (of two trees) to be treated later in 2009.

All Northern Territory infestations are being managed and have been mapped using methodology developed by the Australian Government's *A field manual for surveying and mapping nationally significant weeds*. The treatment of all known infestations in the Northern Territory remains feasible in the short term, and with ongoing commitment, will likely achieve eradication.

Western Australia

Mesquite occurs in the Gascoyne, Pilbara and Kimberley regions of Western Australia with active management across all three regions. As detailed in strategy 2.2, strategic control is occurring to further containment goals of the Pilbara's core infestation as well as to remove mesquite from all sites in the Gascoyne and Kimberley.

¹ A further plant was recently found on a property near Mataranka.

In the Pilbara, 75,000 ha was treated, including 35,000 ha on Mardie Station and 40,000 ha on properties in the Onslow area. This equates to managing about 33% of the Pilbara infestation area (including both core and non-core) during 2008–09.

In the Gascoyne region a mapping exercise has now covered 95,000 ha and recorded sparse occurrences of mesquite. One property had occurrences of mesquite over 26,000 ha with most plants associated with riparian areas. A medium density site was mapped in the Bibbawarra bore road running north of Carnarvon and in a 6 km band out from the Gascoyne River (for about 8 km from the mouth of the river inland). Over 15,000 ha of mesquite infestations have been controlled in the Gascoyne during 2008–09.

In the Kimberley region, a survey has occurred of one property in April 2009 to assist with delimitation of infestations. About 40,000 ha were surveyed, with low density occurrences found along drainage lines. A control program to build on previous efforts is currently being developed by the Pilbara Mesquite Management Committee and Western Australia's Department of Agriculture and Food. Two other sites in the Kimberley remain the subject of monitoring and follow-up control.

Progressive control of strategic infestations in the Gascoyne, Pilbara and Kimberley will be required over the medium to long term.



Figure 4. Scattered mesquite (centre) invading native grasslands in the east Kimberley. This site was aerially surveyed in 2008. (Image: Linda Anderson, Pilbara Mesquite Management Committee)

Queensland

Mesquite occurs across a broad geographic area of Queensland, although the majority of infestations occur in western areas. Control of mesquite is primarily driven regionally and is complemented by state policy and guidelines.

Southern and South East Queensland

An infestation of honey mesquite (*P. glandulosa*) found in 2007 in the Texas area of southern Queensland has previously been treated and remains the focus of monitoring

and follow-up control. Management of the 200 ha site involves strong collaboration between Queensland Primary Industries and Fisheries and Goondiwindi Regional Council.

Two small-scale infestations of mesquite near Gayndah are the focus of ongoing control efforts by North Burnett Regional Council and landholders. Future follow-up control and monitoring will be required.

Central Queensland

Isolated mesquite occurs in the Central Highlands with all known infestations previously treated and thought to be eradicated (Bogantungan, Willows, Alpha and Emerald). No regrowth or seedling emergence has been recorded to date and all sites are being monitored. Isolated mesquite plants also occur in the Rockhampton area but little priority is currently being given to their control.

Central western Queensland

Many occurrences of mesquite are present in the central west although the vast majority are small scale and low density. During 2008–09, Desert Channels Queensland Inc have progressed control with strong landholder involvement at 13 properties. A total of 68,000 ha of infestation were treated with sites located in Longreach, Winton, Boulia, McKinlay and Flinders Shires. Control work was supported by Queensland Government Pest Offensive funding under a collaborative arrangement with Southern Gulf Catchments Ltd.

Desert Channels Queensland Inc have an excellent recording and mapping system that is updated regularly. The mapping forms the basis for project planning and prioritisation.

North-western Queensland

The Get Rid of Mesquite initiative, commenced in 2007, has now made some moderate advances in the regional implementation of a mesquite pilot project. The group has produced a database of properties affected by mesquite, drafted a regional distribution map, discussed extension needs and promoted awareness, developed an infestation category system to reflect management needs, finalised a project plan and sought Caring for Our Country resources to address the problem.

The initiative is coordinated by Queensland Primary Industries and Fisheries with strong cross-agency, local government and Southern Gulf Catchments Ltd support. Unfortunately, the recent Caring for Our Country application submitted by Southern Gulf Catchments Ltd has been unsuccessful.

Most recent control efforts in north-western Queensland have been facilitated by Southern Gulf Catchments Ltd with high levels of landholder involvement. The projects have been supported by Queensland Government Pest Offensive funding of \$195,000 and Commonwealth Defeating the Weeds Menace funding of \$136,510.

- lower Gulf plains—Three strategic sites were treated, including a station 40 km south of Burketown (1000 ha treated) where control will help protect Beames Brook and associated wetlands; a property 10 km east of Burketown (400 ha treated) where control is protecting the Harris Lakes wetland; and a property 50 km south of Normanton where the Flinders and Norman River catchments are at risk of invasion.
- Cloncurry River and Williams River catchments—A project on the Williams River 50 km east of Cloncurry saw 500 ha of herbicide treatment followed by extensive mechanical

clearing of dense mature mesquite over a further 250 ha. Three other properties near Cloncurry are continuing to treat their decreasing mesquite infestations.

Control of the Hughenden and McKinlay sites are documented in strategy 2.2 of this report.



Figure 5 (left). Successful control of mesquite in the lower Gulf near Burketown has assisted in the protection of the Harris Lakes wetlands. **Figure 6 (right).** Selective mechanical clearing has removed high density infestations associated with the Williams River floodplain near Cloncurry. The site will be managed to encourage pasture regrowth. (Images: Charles Curry, Southern Gulf Catchments Ltd)

Future eradication challenges

Control of small to medium infestations is achievable with adequate resourcing and most landholders have generally recognised the threat of mesquite during this early invasion stage. However, a major ongoing challenge will be how to quantify and address the large number of properties (particularly in Western Queensland) which have very low level occurrences. A small proportion of these landholders are unsure of identification while some are complacent to the threat of mesquite. A range of actions including data collection, surveys, awareness campaigns and extension, voluntary compliance and systematic inspections may need to be considered.

Strategy 2.4: Prevent spread

Desired outcome: Mesquite species are restricted from spreading

As mesquite occupies a small percentage of the area susceptible to invasion, the prevention of spread is a major goal of the National Strategic Plan. This goal was achieved during the reporting period through actions associated with: legislative and policy support, awareness and education and research.

Legislative and policy support

The Australian Quarantine and Inspection Service (AQIS) continues to prohibit and monitor the importation of mesquite species that are considered a threat to Australia. In addition, all mesquite species are declared nationally under state and territory legislation, which prohibits trade and requires control.

Quarantine protocols exist to reduce the risk of interstate spread by livestock and machinery. State and territory legislation also forms a policy basis for limiting the spread of declared weeds. Queensland currently has a weed spread prevention policy in place. This

policy aims to reduce the spread of declared weeds by promoting protocols and procedures for improved hygiene practices (such as clean-downs).

National awareness and preventative actions

Awareness actions are assisting with increased recognition of the threat, early detection and the implementation of appropriate spread prevention actions. Some of the actions completed over the past year have included media articles, presentations, distribution of fact sheets and one-on-one extension by weeds officers.

The level of national compliance to stock hygiene protocols has not been adequately evaluated to date. However, one study in north-western Queensland found that that 34% of graziers use weed vendor declaration forms; 34% ask or give verbal advice of weed risk; 23% prevent stock from eating mature seed pods and 49% quarantine stock to remove weed seeds. The vast majority (95%) of graziers are undertaking one or more means of spread prevention. Some agricultural companies also have strong protocols in place.

It is likely that preventative actions are greatest in association with core infestation areas (due to greater awareness) and could be limited where minor occurrences of mesquite are present.

Many township amenity plantings have been removed through work in previous years (e.g. Winton and Ilfracombe in Queensland) while other peri-urban areas remain untreated (e.g. Cloncurry, Maxwellton and McKinlay in Queensland). The incentives for removal of these historical plantings are limited and the continued tolerance of these sites is sometimes noted as a reason for landholder inaction.

Research

Studies have been undertaken of many aspects of mesquite ecology (as detailed in strategy 2.2). Two primary extensions of this work relate to spread prevention.

Firstly, Queensland Primary Industries and Fisheries' Tropical Weeds Research Centre have recently instituted a trial to assess seed bank longevity. Mesquite seed lots have been buried at various depths (0–20 cm) in the soil profile of both cracking clay and sandy loam soils. Different levels of grass cover have also been imposed (either bare or full cover) to test whether micro-habitat can influence longevity. Seed lots are being retrieved at set intervals to allow development of seed decay curves and subsequent longevity predictions. The results will be used to better inform land managers of the likely duration of control programs.

Secondly, CSIRO have a national monitoring program in place to assess seed bank levels and seedling establishment. Opportunistic monitoring occurred early in 2009 following very high rainfall events in the Gulf region of Queensland. Seed bank levels and seedling numbers were low, perhaps as a result of the two previous low rainfall years.

Conclusion

Major progress of the Mesquite National Strategic Plan's four goals has been achieved during 2008–09. The on-ground success of projects is evident, with over 100,000 ha of non-core areas directly treated; this reflects the level of collaboration and coordination at all levels.

Most sites are under effective management in South Australia, New South Wales, Western Australia and the Northern Territory, while the regional Get Rid of Mesquite initiative may provide a model for regional management in Queensland.

Containment of the core infestation areas has been achieved at two sites (Quilpie and McKinlay in Queensland) with accelerated on-ground control associated with the Pilbara and Hughenden sites. Much of the research regarding mesquite has or will be collated in the near future, with the results providing valuable guidance to the best practice control of infestations.

The national strategic plan review is nearing completion and will provide future direction for the management of mesquite in Australia. Regardless of the reviews outcomes, ongoing collaboration and coordination at many levels will be required to maintain outcomes and momentum achieved so far.

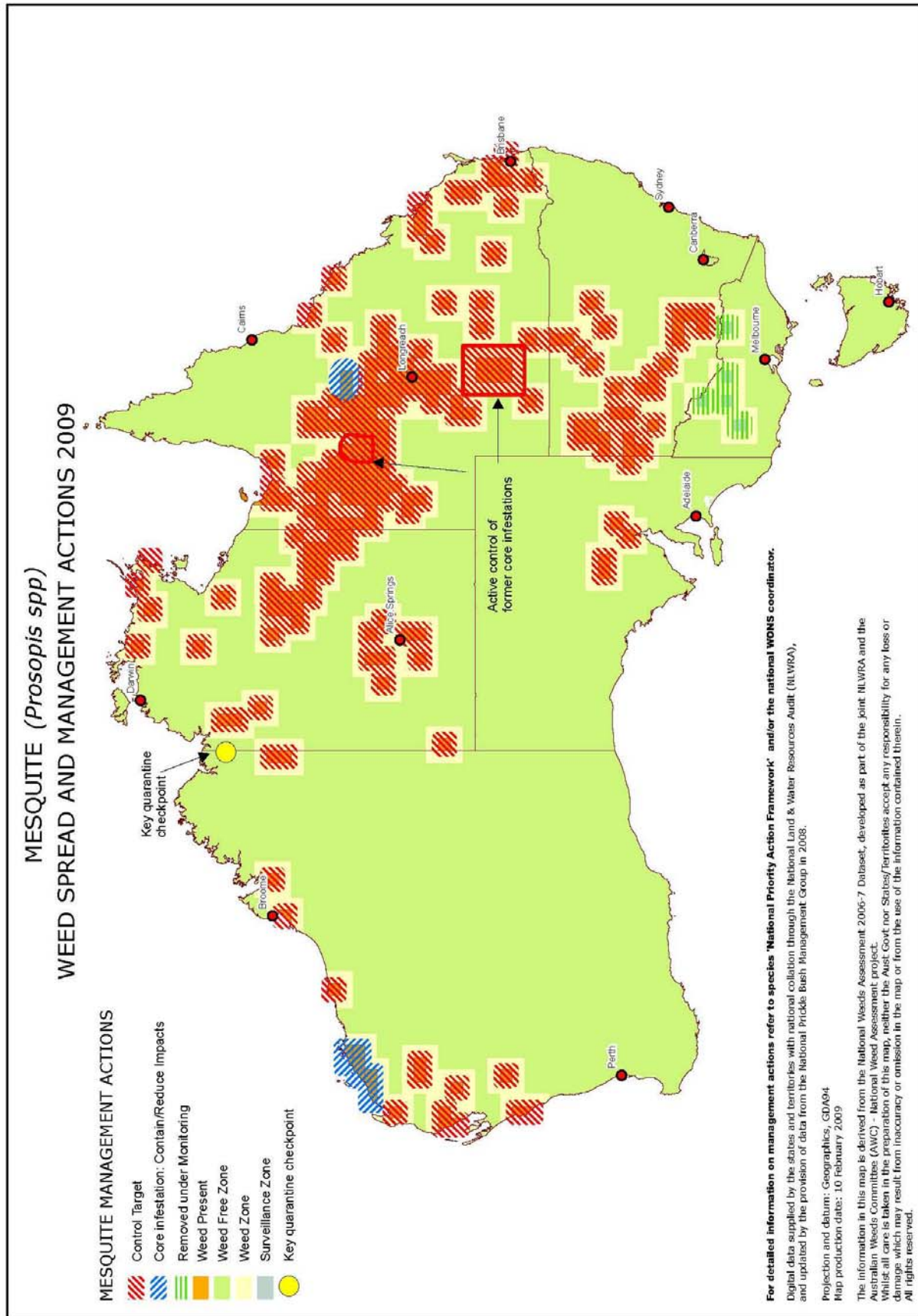
Appendix 1. Acknowledgements

Contributions to the development of this report were provided by a range of organisations and individuals. In particular, significant portions of this report have been drawn from presentations of National Prickle Bush Management Group members made at the National Strategy Review Workshop held in Broken Hill New South Wales, June 2009.

The following are acknowledged for provision of presentations, documents or related correspondence:

- Louise Moloney
- Earl Sparkes
- Brett Carlsson
- Debra Agnew
- Mark Tarrant
- Alice Beilby
- Noel Wilson
- Linda Anderson
- Peter Gray
- Dr Rieks van Klinken
- Dr Shane Campbell
- Dr Bill Palmer
- Charles Curry
- Jodie Sippel.

Appendix 2. Mesquite distribution and management actions 2008–09



Appendix 3. National Prickle Bush Management Group members 2008–09

| Name | Organisation or affiliation |
|------------------------------|--|
| Ms Louise Moloney (Chair) | Queensland community representative Landholder |
| Mr Earl Sparkes | Queensland agency representative Department of Employment, Economic Development and Innovation |
| Mr Brett Carlsson | Queensland community representative Desert Channels Queensland Inc |
| Mr Mark Tarrant | Northern Territory agency representative Natural Resources, Environment, The Arts and Sport |
| Ms Alice Beilby | Northern Territory community/industry representative Savanna Solutions Pty Ltd |
| Mr Noel Wilson | Western Australia agency representative Department of Agriculture and Food |
| Mr Damian Collopy* | Western Australia agency representative Department of Agriculture and Food |
| Ms Linda Anderson | Western Australia community representative Pilbara Mesquite Management Committee |
| Mr Peter Gray | New South Wales agency representative Department of Primary Industries |
| Ms. Deb Agnew | South Australia community representative South Australian Arid Lands Natural Resource Management Board |
| Dr Rieks Van Klinken | Research representative CSIRO |
| Dr Shane Campbell | Research representative Department of Employment, Economic Development and Innovation |
| Charles Curry [#] | Queensland community representative Southern Gulf Catchments Ltd |

* Resigned from the group in late 2008.

[#] Attended National Strategy Review Workshop in Broken Hill as proxy member in lieu of Brett Carlsson.

Appendix 4. Mesquite-related scientific papers published in 2008–09

Listing provided by Dr Rieks van Klinken, CSIRO

Refereed journal publications

Robinson, T.P., van Klinken, R.D. and Metternicht G. (2008). Spatial and temporal rates and patterns of mesquite (*Prosopis* species) encroachment in Western Australia. *Journal of Arid Environment* 72, 175-188.

Books and book chapters

van Klinken, R.D. and Campbell, S. (2009). Australian weeds series: *Prosopis* species. *Australian Weeds Series, Volume 3*, pp. 238-273 (ed. F.D. Panetta).

van Klinken, R.D., Hoffmann, J.H., Zimmermann, H.G. and Roberts, A.P. (2009). *Prosopis* species (Leguminosae). *Biological Control of Tropical Weeds using Arthropods*, eds. R. Muniappan, G.V.P. Reddy and A. Raman, pp. 353-377. Cambridge University Press, Cambridge, UK.

Edited proceedings (refereed)

Colasanti, R., van Klinken, R.D. and Buckley, Y. (2008). The dynamics of invasion as a function of landscape connectivity. Proceedings of the 16th Australian Weeds Conference, eds R.D. van Klinken, V.A. Osten, F.D. Panetta and J.C. Scanlan. (Queensland Weeds Society, Brisbane), pp. 130-2.

Lawson, B.E., van Klinken, R.D. and Zalucki, M.P. (2008). Improving the agent selection, release and evaluation process: the role of bioclimatic modeling. Proceedings of the 16th Australian Weeds Conference, eds R.D. van Klinken, V.A. Osten, F.D. Panetta and J.C. Scanlan. (Queensland Weeds Society, Brisbane), pp. 510-512.

Appendix 5. Budget

| 2008-09 | | Planned budget | | Actual Expenditure | |
|---|---|--|---|---|--|
| Employees and positions held | | Recipient's contributions (without GST) | Funds paid by the Commonwealth (without GST) | Recipient's contributions expended (without GST) | Commonwealth funds expended (without GST) |
| 1.0 FTE National Coordinator @ AO6/4 (on-costed) | | | 109,608 | | 100,252.66 |
| Queensland in-kind support (salaries)—management, admin. support, research officers | | 53,045 | | 53,045 | |
| Other contributions—NRM groups, state/territory and community support | | 55,335 | | 55,335 | |
| NPBMG 12 members @ \$350/day x 10 days | | 42,000 | | 42,000 | |
| A | Total employment costs | 150,380 | 109,608 | 150,380 | 100,252.66 |
| <u>Operating cost Items</u> | | Recipient's contributions (without GST) | Funds paid by the Commonwealth (without GST) | Recipient's contributions expended (without GST) | Commonwealth funds expended (without GST) |
| Coordinator travel | | | 17,000 | | 12,854.79 |
| 4WD vehicle lease & minor repairs | | | 25,000 | | 20,260.54 |
| Telecommunications inc. phone & computer costs | | | 5000 | | 2106.55 |
| Field equipment, training & minor operating | | | 1000 | | 3824.15 |
| Postage & freight | | | 700 | | 499.19 |
| NPBMG meetings and coordination | | | 15,721 | | 2823.85 |
| National teleconferences | | | 2000 | | 0 |
| In-kind support—office, facilities and equipment | | 14,200 | | 14,200 | |
| B | Total Operating costs | 14,200 | 66,421 | 14,200 | 42,369.07 |
| C | Total cost (without GST) (A + B) | 164,580 | 176,029 | 166,580 | 142,621.73 |
| D | GST (10%) | 16,458 | 17,603 | 16,658 | 14,262.17 |
| E | Total cost (including GST) | 181,038 | 193,632 | 183,238 | 156,883.90 |

Note: Coordination figures are split between prickly acacia, parkinsonia and mesquite.