



WEEDS OF NATIONAL SIGNIFICANCE

Prickly Acacia Distribution - 2020

Desert Channels NRM Region

DOCUMENT SUMMARY

Around 2015, at its peak regional distribution, this Weed of National Significance covered an estimated 22,976,000 ha of the DCQ region in varying densities. This is a large increase from the Queensland Government estimate of 2,008,000 ha in 1996. The annual regional economic impact of this weed due to pasture loss and increased operating costs is estimated by the Federal Government to be approximately \$50 M per year to manage this weed. A recent report by the Queensland Department of Agriculture and Fisheries (QDAF) released in 2020, has shown that treating Prickly Acacia can provide an annual \$130,000 / property increase in net present value. Not only does the control therefore increase farm profitability and fiscal resilience, the rehabilitation of degraded areas improves grazing management and drought resilience. The cost of not treating this weed, therefore, has lost production benefits, but environmental monitoring has shown that even at moderate infestations of this weed, ecosystem functionality collapses and riparian habitat becomes increasingly fragile – a serious issue in a region with 25 rare and threatened species.

The DCQ Prickly Acacia Weed Eradication Project, begun in 2013, brings together traditional and emerging control techniques with cutting edge detection and monitoring to ensure efficiencies are maximised to control this weed. Landholder participation, strong peer to peer learning and resolving labour deficiencies has been the key to the systematic control of this weed. Supported by good science, a sound regulatory framework and project governance this weed is now being controlled over very large areas.

Surveying of weed densities is consistently now showing that the previous trend of increasing distribution of this weed over the past two decades has not only stabilised, but is now in decline within the region. The 8% or 1.89 million ha reduction in distribution from the 2015 survey is due to increased activity by landholders, land managers and local authorities, co-ordinated control of high seed producing areas by the Desert Channels Queensland (DCQ) NRM Group and improved inter and intra-regional biosecurity measures being undertaken by both community and industry. Control activities have been supported by a regulatory framework implemented by both the Federal and State Government which have delivered significant efficiency savings, and ongoing investment in research and development to operationalise improved control techniques.

Since the start of 2016 weed distribution surveys have been undertaken by DCQ on 382 properties within the region with 32,471 ground and 16,335 aerial survey points collected to validate satellite interpretations. A total of 736 weed monitoring sites have now been established within the region. Combined this means that the confidence in the data is steadily increasing and that more refined and targeted strategic investment can be made.

PRICKLY ACACIA

STRATEGIC PLAN

The Strategic Plan guides investment to:

1. Mitigate the risk of establishment of new prickly acacia infestations arising from the spread of seed
2. Reduce the extent of in situ prickly acacia infestations
3. Increase community skills, knowledge and awareness to improve peer to peer learning and control methodology adoption
4. Provide the conditions for rehabilitation
5. Remap existing and new infestations to aid in region based collaborative planning
6. Monitor effectiveness of control activities, monitor condition of rangelands and aid intra and inter-regional learning



The supported investment focus has been in the control of high seed-producing areas. The regional investment model is based on co-investment with landholders to build on Government investment, rather than simple grant-based investment models. A property investment plan is developed in conjunction with the landholder based on data from weed surveys with the aim being the sequential eradication of the weed, the recovery of perennial pasture species to build long term resilience, the introduction of property-based biosecurity measures and monitoring to safeguard investment.



The 2013 change in investment focus by DCQ, the development of the Strategic Plan and the better integration of whole of farm weed control into farm business management has resulted in over 140 landholders within the region or 16% of the region's landholders now re-engaged in weed control managing a total of over 3 million ha, with nearly 2 million hectares of that with weed infestations. There are now 97 ground monitoring sites validating satellite and high-resolution drone images to detect emerging weed infestations and measure improvements in land condition.

The pace of weed control within the region appears to be accelerating as co-ordinated control is expanded, landholder and contractor skills are improved and more efficient emerging control techniques are integrated with traditional techniques. This acceleration however, has limits, as the primary control agent remains a person applying chemical from an ATV. The continued and widespread use of Tebuthiuron based chemicals remains central to the control of this weed by providing initial control of mature plants and residual control of emerging seedlings.



REPORT

BACKGROUND

This is the first written report outlining the distribution Prickly Acacia specifically in the Desert Channels Region. It builds on surveys and mapping undertaken in 1996 by the Queensland Government, estimated distribution of this weed from studies by researchers from the University of Queensland in 2005 and, more recently, the 2015 distribution survey by Desert Channels Queensland along with broad weed surveys by QDAF. While each survey has used different methodology, contemporary survey methodology is uniformly moving to the analysis of increasingly detailed satellite imagery, the use of high-resolution drone and aerial imagery, and spatial analysis of images to calibrate field observations. Combined with a more systematic approach to the surveys, the necessary consistency in data reliably is now being incorporated to better plan strategic investment moving forward.





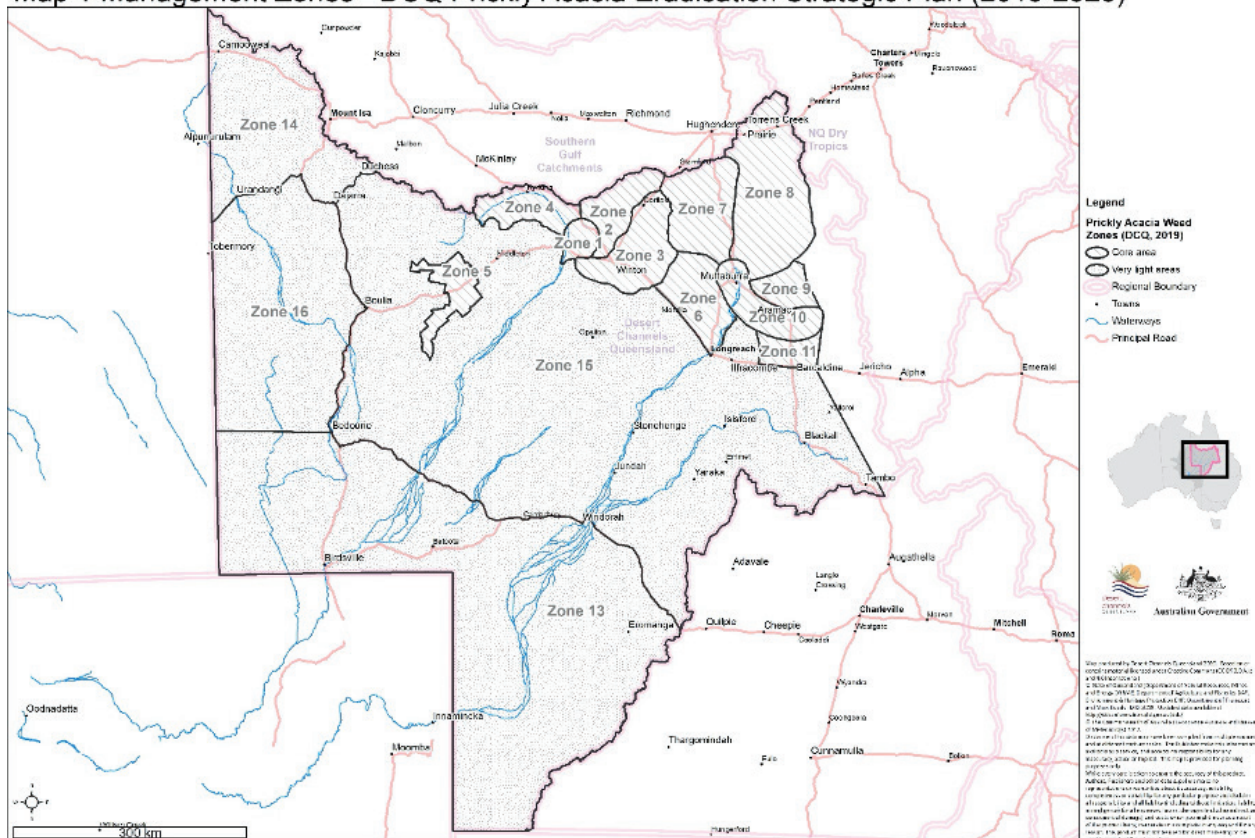
Despite the variance in previous survey methodology however, the surveys collectively provide clear trends. If the current pace in the decline of the weed distribution is maintained, surveillance and detection will become more crucial to aid in prioritisation of future control activities. All surveys have their limitations and are necessarily a balance between cost and data reliability and as such, area estimates will always remain as estimates for this reason. The difficulty in detection of this weed in heavily timbered regional ecosystems, and along heavily timbered watercourses, or in ultra-low densities and as juvenile plants particularly as the plants become defoliated due to extended water stress, will always provide local inconsistencies. The importance of the surveys however remains the trends which now appear to be more positive than in 2015.



REGIONAL WEED DISTRIBUTION STRATEGY

The DCQ NRM region is broken into 16 management units (Map 1) and investment in Prickly Acacia control by Desert Channels Queensland has been governed by a Strategic Plan developed in 2013.

Map 1 Management Zones - DCQ Prickly Acacia Eradication Strategic Plan (2013-2023)



This weed is not evenly distributed across the 16 management units with the densest infestations in the Kynuna, Winton, Corfield, Muttaborra, Aramac and Barcaldine areas with the number of management zones reflecting this density. Outside of these areas, infestations can be locally dense but generally remain light to scattered with densest infestations principally in waterways or associated with areas of higher available moisture.

Since 2013 investment in the control of this weed under a range of government programs has been focused on the priority management zones of 1,2,4,7,8,9,10 and 11 and it is in these zones that the majority of reduction in area of this weed has occurred. The 2019 flood event mobilised weed seed and produced the conditions for germination over large areas of the region. The primary impact has been the thickening of existing infestations and localised increase in extent in all affected management units and the increase in extent and density of this weed particularly in management zone 15.

The relatively limited increase in distribution of this weed following the 2019 flood event is attributed to the sustained focus on control of seed production areas since 2013, multiple years of drought reducing seed production in adjoining paddocks areas, and the consistent and diligent effort by landholders to control emerging seeding plants.

Table 1 Distribution of Prickly Acacia within the Desert Channels NRM Region by management zone.

Management Unit	Area of Management Unit (ha)	Estimated Distribution 1996* (ha)	Estimated Distribution 2015 (ha)		Estimated Distribution 2020 (ha)		
			High Density	Low Density	High Density	Low Density	Change since 2015 (%)
Mgt Unit 1	205,300	172,575	20,530	184,770	3,579	154,900	-22
Mgt Unit 2	545,957	355,510	76,450	464,062	17,573	257,920	-49
Mgt Unit 3	880,013	340,738	54,872	725,141	28,864	465,000	-37
Mgt Unit 4	547,302	122,498	75,138	472,164	56,894	123,982	-66
Mgt Unit 5	441,497	-	36,840	404,657	15,580	289,673	-30
Mgt Unit 6	732,319	4,533	25,863	338,922	11,690	230,922	-57
Mgt Unit 7	997,048	282,465	97,490	600,000	44,670	450,500	-35
Mgt Unit 8	1,874,457	102,949	143,960	656,069	83,580	436,890	-34
Mgt Unit 9	323,774	192,253	103,580	193,396	73,470	120,000	-34
Mgt Unit 10	634,289	320,653	107,890	445,488	52,500	288,000	-38
Mgt Unit 11	289,499	107,111	45,350	165,014	15,250	125,000	-33
Mgt Unit 12	1,112,514	-	1290	845,350	1290	237,842	-71
Mgt Unit 13	13,565,137	-	6,590	263,000		260,750	-3
Mgt Unit 14	3,106,238	-	2,839	1,550,000		1,672,839	+8
Mgt Unit 15	19,560,489	596	1,750	12,310,000		12,750,000	+3
Mgt Unit 16	5,118,499	-	17,328	2,540,207		2,800,000	+10

*Postal survey undertaken by the Qld Government in 1986 collated and presented in 1996

For the purposes of the 2015 survey, the area distribution of this weed was not only estimated, but to allow better planning, density was also broadly defined. High density was considered a stem density over 300 stems / ha with low density below this. Distribution was estimated using a combination of satellite and aerial photography calibrated with ground surveys conducted on property. Due to the use of Landsat imagery and its relative image coarseness, absolute areas need to be treated with some caution however the preference of this plant to colonise naturally treeless regional ecosystems means that there is confidence in relative trends.

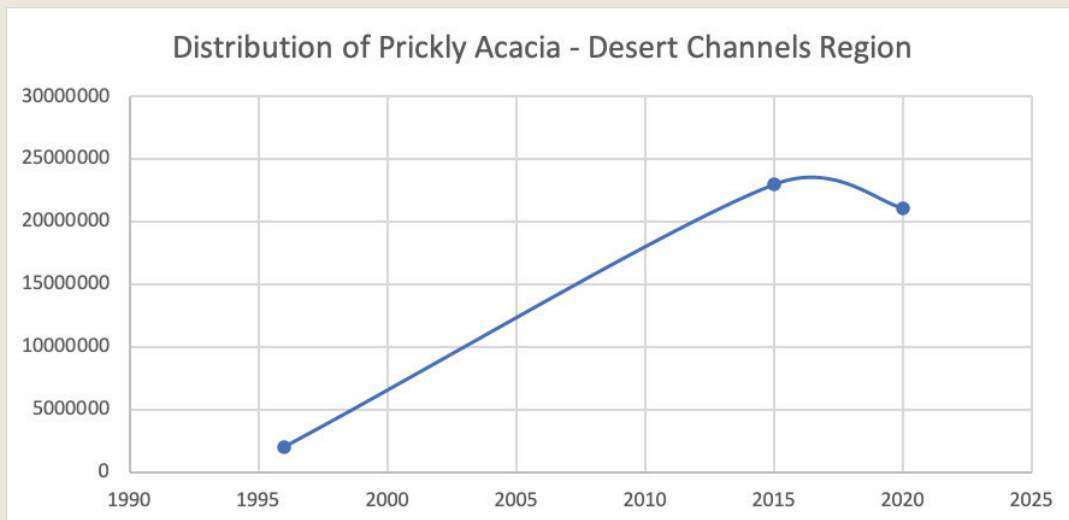
The 2020 distribution was again calculated primarily through the interpretation of satellite imagery and validated with ground survey points. The advances in image resolution however have now meant that there is greater confidence in the data. This data was also calibrated to ground surveys on properties, the greater use of high-resolution aerial imagery to better estimate density and aerial surveys undertaken with helicopters. This data was also calibrated against data collected by other sources such as the Queensland Department of Agriculture and Fisheries to confirm trends and data.



REPORT

OUTCOMES

The data shows a decline in the overall weed distribution of 8% since 2015, however, this is not evenly distributed between the management units. While not large in itself, this is in fact the first recorded decline in distribution and reverses a 23-year trend. While the 2019 flood event increased the distribution of the weed, the area of increase is substantially lower than expected. The management units with declines have been focal areas for on-ground control activities and sustained education and awareness campaigns. Collaboration between NRM and local Government is high in the areas and both landholders and community are engaged.



The decline in overall area of the weed is a welcome outcome of the investment made since 2013 but more significantly the reduction since 2015 is indicative of the increased community participation on weed control, increased awareness in the industry about biosecurity issues and weed seed spread, and the continued roll-out of ever more efficient control techniques. This occurs due to the collaboration between everyone involved.

The data shows that not only is the distribution of this weed now reducing, it is reducing in the critical high seed producing areas. The concentrated effort to reduce these areas is one of the reasons attributed to the lower than expected increase in the distribution of the weed in management units 13,14,15 and 16 following the 2019 flood event.

Investment focus must remain in the key management units for the foreseeable future to realise the investment made to date, however there is growing opportunity to expand the investment into other management units with complementary projects. Within the key management areas, focus must remain on elimination of high seed-producing areas and complementary widening of the control by landholders in the lighter areas. Community awareness about the weed and increasing skills and knowledge of control remains an extension priority as does the continued focus on reducing biosecurity risks both on farm and within the region. To achieve this requires the continued co-ordination of control activities, extension and compliance.

The greater integration of emerging technology, particularly remote sensing data, will reduce costs for the detection of the weed along with allowing for more strategic investment.

