

# REVIEW OF PROGRESS TOWARDS THE ALLIGATOR WEED STRATEGIC PLAN 2008-2009



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**Australian Government**

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# **ALLIGATOR WEED STRATEGIC PLAN 2008 - 2009**

## **Executive Summary**

The National Aquatic Weeds Management Group (NAWMG) continued to oversee implementation of National Alligator Weed Strategic Plan and provide national coordination during the 2008/2009 financial year. This report documents the progress towards implementation of this plan. Key achievements and developments resulting from national coordination and the efforts of key stakeholders are summarised below.

Aquatic weed identification workshops held in Queensland and South Australia trained over 192 weed professionals, waterway managers and community members on how to identify alligator weed and other high priority aquatic weeds. Other key education and awareness activities included two alligator weed field days in NSW, development of an alligator weed television advertisement for NSW and regional advertising in high priority regions in South Australia.

Three new naturalised alligator weed infestations were detected during 2008/2009. The first infestation was detected at Forest Lake in the south western suburb of Brisbane whilst the second infestation was detected near Woodburn on the NSW North Coast. The third infestation was detected at Sandown in Melbourne.

Progress towards containment and eradication of non-core alligator weed infestations continues with 24 of the 30 non-core sites adequately contained or destroyed. The adoption of metsulfuron for alligator weed control has made considerable impact to eradication programs with 80- 90% reduction in alligator weed density recorded at two sites in Queensland.

A prioritisation process of core alligator weed infestations in the Hunter region identified the infestations to be a further risk of spread and/or posing immediate threat to key ecological sites. This project built on earlier risk assessment efforts by a Defeating the Weeds Menace project. The results of this risk assessment will help guide future investment and monitoring for alligator weed core infestation management in the Hunter region. A similar prioritisation process for the Sydney region is expected to be completed during 2009/2010.

Research initiatives continue to make significant contributions to alligator weed management. Studies by Vic DPI have confirmed that current herbicides when sprayed on large aquatic patches do not adequately kill aquatic plant fragments and that management needs to incorporate measures to ensure fragments don't spread downstream. Research by Biosecurity Queensland commenced to determine efficacy of additional herbicides and surfactants with results expected in 2009/2010. Joint studies by CSIRO and NSW Department of Primary Industries identified an integrated mowing and herbicide regime that can considerably reduce impacts of terrestrial alligator weed on pastures in core infestation regions by up to 90%. Other research contributions included the completion of the Unmanned Aerial Vehicle concept for alligator weed detection by University of Sydney and continuation of research by CSIRO to test host specificity of potential biocontrol agents and DNA sampling of alligator weed populations to determine the plants origin in its home range.

# **ALLIGATOR WEED STRATEGIC PLAN 2008 – 2009**

## **Introduction**

### **Alligator weed – Its history and impacts in Australia**

Alligator weed (*Alternanthera philoxeroides*) is a Weed of National Significance (WoNS) because of its severe impacts to freshwater ecosystems. It adversely affects the biodiversity and functioning of wetland and riparian ecosystems, water quality, water storage and distribution infrastructure, recreation and amenity values.

Alligator weed was believed to have been first introduced into Australia through discharged ballast water in the Hunter River during the 1950's but recent genetic research suggests there have been at least three separate introductions into Australia. It has since spread throughout the Hunter floodplain, central east coast and greater Sydney (which makes up the core infestation) and to a range of non-core sites in the Australian Capital Territory, New South Wales, Queensland and Victoria.

### **A National Solution**

The national Alligator Weed Strategic Plan identifies a range of required tasks to prevent spread, eradicate non-core infestations and manage/contain? the core infestations. Implementing the plan is the responsibility of a range of stakeholders from a landholder level to the Australian Government.

### **Progress to Date**

Key progress to date on the national Alligator Weed Strategic Plan includes:

- successful containment of a 250ha infestation in Barren Box Swamp and downstream sites in the Wah Wah irrigation district near Griffith NSW
- education and awareness campaigns with Sri Lankan and other ethnic communities, which considerably reduced the cultivation? of this plant as a food source
- a range of potential new biocontrol agents identified through research
- production and release of the alligator weed control manual
- widespread adoption of metsulfuron-methyl as the preferred herbicide of choice for aquatic and terrestrial infestations
- implementation of active management programs (with goal to contain and eventually eradicate) at all non-core (outlier) alligator weed sites
- development and distribution of a range of alligator weed extension materials to the general public, key stakeholders and landholders in key regions
- discovery of 19 new non-core infestations since 2003, the majority of which have been small in size, indicating early detection success (three of these infestations have since been destroyed)
- development of an aquatic weed identification course, which provides a platform for alligator weed and other aquatic weed identification training. Aquatic weed identification courses have since been held in ACT, NSW, QLD, SA, VIC and WA
- identification of core infestations in the Hunter region posing a high risk of further spread and impact to key ecological assets. The results provide the basis of/for? future management plans and on ground works.

## ***Performance against the strategic plan in 2008/2009***

### **1. Prevent spread**

#### ***National Awareness and early detection programs increased the capacity of stakeholders to identify and report infestations early***

Aquatic weeds identification workshops in both South East Queensland and in Salisbury and Murray Bridge, South Australia, trained 192 people to identify alligator weed and other high priority aquatic weeds. Each participant was trained in the key identification features of alligator weed, invasion pathways and how to report if a suspected new incursion is found. Audiences consisted of local and state government weed and waterway professionals, Waterwatch members, community groups and Catchment Management Authorities. Importantly, funding for these workshops was sourced from state and regional sources including water management authorities, State Government (South Australia) and regional catchment groups, which highlights the effectiveness of the previous pilots run through the aquatic WoNS program. Further identification workshops are planned for NSW, QLD, SA and VIC in 2009/2010.

Two alligator weed field days were held in Sydney and Woomargama NSW to highlight alligator weed problems and to promote best practice approaches. The field days were attended by 46 local government weed officers, catchment management authority staff, landholders and other community representatives. A third field day organised for NSW North Coast farmers was postponed until 2009/2010 due to major flooding in Northern NSW during May.

New regional awareness brochures on alligator weed were developed by DPI Victoria and Griffith City Council. Both brochures contain regionally specific information on the impacts, management and how to report alligator weed.

A range of regional media releases on alligator weed management and impacts were run in Victoria (Bendigo and Warragul districts) and NSW (North Coast, Hunter, Griffith) and South Australia. In addition to the media releases the South Australian Water, Land and Biodiversity Conservation and Mt Lofty Ranges NRM board ran regional newspaper advertising for both alligator weed and cabomba, to highlight the impacts of these weeds and to encourage the public to report suspected infestations.

Funding: South Australian Department of Water Land and Biodiversity Conservation, South East Queensland Water, Greater Hume Council, Defeating the Weeds Menace (National Aquatic Weeds Management Group).

#### ***State/regional committees continue to oversee control programs***

The Richmond River and Barren Box alligator weed taskforces continue to oversee management of their respective non-core alligator weed infestations. Both taskforces continue to monitor progress towards eradication, raise community awareness through the media and engage key stakeholders. In Victoria DPI established an 'Alligator Weed Action Group' consisting of key DPI and Melbourne Water staff to oversee the greater Melbourne alligator weed eradication program. This group aims to meet on a biannual basis in the future.

NSW Department of Primary Industries commenced efforts to update the NSW alligator weed strategy, which is expected to be finalised in 2009/2010.

***Eradicating alligator weed from home gardens.***

Eradication efforts of backyard infestations in Queensland appear to have been successful. Following an inspection by Biosecurity Queensland of all backyard infestations in South East Queensland (112 sites) only one site was found to have alligator weed. In addition, a small terrestrial infestation (less than 1m<sup>2</sup>) was found in a park at Fig Tree Pocket in the Western Suburbs. It's believed this infestation was a result of dumped lawn clippings.

In Victoria an inspection of 200 high priority backyard sites (due to proximity to uninfested streams) in metropolitan Melbourne revealed one third of the sites had alligator weed present. Control programs were implemented at infested sites. The remaining backyard sites are due to be inspected in 2009/2010 with control programs implemented accordingly at infested sites.

***The National Aquatic Weeds Management Group are overseeing the national plan***

The NAWMG helps ensure that the Plan is being implemented and reviewed on a regular basis, and secondly that national management of alligator weed is coordinated at a national level. Two NAWMG meetings and two teleconferences were held in 2008/2009 to:

- review progress of Alligator Weed Strategic Plan, including outputs delivered from key projects and outcomes achieved
- identify key priorities for 2009 to 2011

In addition NAWMG finalised a five year report on progress towards implementation of the national Alligator Weed, Cabomba and Salvinia Strategic Plans. This report documents a range of initiatives and achievements by key stakeholders between 2003 (when the program commenced) to 2008. The report is expected to be distributed to key stakeholders early in the 2009/2010 year.

Stakeholders during 2008/2009 include: NSW DPI, Biosecurity QLD, Pet Industry Association of Australia, DPI Victoria, Noosa Landcare, Local Government, CSIRO and community members.

***Discussion and future directions***

Efforts from 2008/2009 and previous years have reduced the potential for further spread of alligator weed to new locations. However, despite such efforts the risk for further spread of alligator weed is likely to remain.

The alligator weed identification training is a medium to long term concept and its effectiveness for detecting new infestations may not be known for some years. It is worth noting that one new alligator weed infestation was detected in Miriam Vale in central Queensland in the 2009/2010 year by a Weeds Officer who recently completed one of the aquatic weeds identification training sessions listed above. This infestation was over 500km from what was previously the most northern infestation and demonstrates the importance and effectiveness of such training.

Future initiatives for preventing spread will mostly relate to education and awareness campaigns (as per 2.1.4 – national awareness program) and continuing aquatic weed (inc. alligator weed) identification training.

## **2. Identify and eradicate non-core infestations**

All alligator weed non-core infestations are under intensive treatment/control programs. As of the end of the 2008/09 year 24 of the 30 infestations (80%) are considered to be contained with some destroyed or close to being destroyed (eradication is not declared until five years after the last plant is found). The status of non-core infestations or sites are summarised in the table contained in Attachment B.

### ***Improved processes for obtaining minor use permits for aquatic herbicides***

Following a recommendation from NAWMG's five year plan, NSW DPI, Department of Environment and Climate Change (NSW) and Australian Pesticides and Veterinary Medicines Authority established a working group to develop a risk framework for assessment of aquatic herbicide minor use permit applications. The framework will apply to higher risk aquatic herbicides to ensure that herbicide use patterns address off-target impacts to the environment (e.g. threatened species/communities) and social implications are adequately mitigated by the proposed use patterns. Once finalised this framework will provide a more consistent, streamlined and accountable process for issue of minor use permits and will likely allow use of higher risk aquatic herbicides in NSW.

NSW DPI are piloting this draft framework and commenced preparation of a minor use permit application, to enable the use of Imazapyr to control strategic alligator weed non-core infestations in NSW. Research in Australia, New Zealand and USA has demonstrated this herbicide has greater efficacy on alligator weed than current products.

Whilst the above actions are not documented in the national strategy it does make an important contribution to the program as most herbicides used for aquatic WoNS management can only be applied under minor use permits.

### ***New non-core infestations detected in the 2008/2009 year***

Three new outlier infestations were detected during the 2008/2009 year, taking the total number of outlier infestations to 30. Firstly, Brisbane City Council weeds staff detected a new alligator weed infestation at Forest Lake in Brisbane's south west. Secondly, in northern NSW a new infestation was detected by Lismore Council staff near Woodburn. The potential source of this infestation is the upstream infestations in the Wilsons River. Finally, a 2.5 hectare infestation growing in an irrigation retention pond at the Sandown racecourse was discovered, which is downstream of existing outlier infestations in Melbourne.

Rapid response measures were implemented at the Queensland and NSW sites. Both of these detections demonstrate the value of early detection initiatives that have been initiated in both regions. The Sandown racecourse site poses some difficult challenges for management and efforts are currently underway to identify the best course of action for treatment.

In addition to these new detections, the infestation at the Bendigo site in North Central Victoria, which was previously thought to have been eradicated, has reappeared. This infestation is scheduled to be mechanically removed during 2009/2010 with follow-up treatment programs implemented.

#### ***Eradication efforts in New South Wales and ACT***

Management efforts for the majority of outlier infestations in NSW are on track towards eradication with reductions in either infested area or management effort recorded at most sites. The increased amount of alligator weed reported at Barren Box Swamp is more of an abnormality due to favourable weather conditions promoting growth, rather than an increasing alligator weed problem. However, of major concern is the infestation in the Wilsons River, which still presents considerable management challenges and has potential to become a core infestation area if it's not correctly managed.

#### ***Eradication efforts in Queensland***

The majority of eradication programs in Queensland are now utilising metsulfuron-methyl (as per best practice recommendations) and it's hoped that the herbicide will be adopted for use at all sites within Queensland. The eradication programs at the Currumbin and Oxley Creek sites resulted in over 90% reductions in infestation levels compared to previous years. However, the Mudgeeraba site is posing significant management challenges due to its size and the catchments complex hydrology. It's likely this infestation will be managed to contain and reduce impacts as to such time as an improved strategy for eradication can be identified. The new infestation at Bullock Head Creek was treated shortly after detection but recent floods may have spread this infestation further.

#### ***Eradication efforts in Victoria***

Victorian investment in alligator weed management represented over \$300,000 in 2008/2009 in an effort to bring infestations back to manageable levels. Aquatic infestations at the Warragul site in West Gippsland (a high priority outlier) were mechanically excavated, which removed the bulk of the biomass and the immediate threat of further downstream spread. Terrestrial infestations were treated chemically and a directions notice was issued to the local council to prevent further mowing at the site.

Due to the extent of infestations, priority for treatments focused on Darebin Creek, Merri Creek and the Yarra River as each system has a high public profile and currently infestation levels in each site are relatively low. Eradication efforts focused on manual removal of upstream infestations, thus removing propagules sources and reducing upstream limits. Control efforts continued in lower reaches of these systems and in the lower priority Eumemmering Creek and Hallam drains.

Funding: DPI Victoria and Melbourne Water

#### ***Survey programs conducted at high risk sites***

Survey programs of downstream areas were conducted at high risk sites in Victoria and Northern NSW. A survey, by NSW DPI and Far North Coast Weeds, of waterways immediately downstream of the new infestation at Woodburn resulted in

the discovery of further infestations, which were immediately treated. Extensive surveys, by DPI Victoria, of waterways immediately downstream of the Warragul and Bendigo infestations did not detect new infestations. Surveys of infestations in the metropolitan areas of Melbourne identified and mapped the upstream limits of infestations, which will be critical for planning future control programs.

### ***Discussion and future directions***

Active containment/eradication programs are in place at all sites but improved tools and strategies are required to achieve this goal. Despite the availability of the control manual eradication remains a difficult goal and a clear need remains to improve eradication methods and strategies. This includes reviewing and improving herbicide performance, identifying effective non-herbicide options, and the development of effective integrated strategies.

Despite recent improvements in reporting and monitoring outlier eradication (e.g. reporting templates) further improvements are necessary to track progress towards eradication. Stakeholders have identified monitoring progress towards eradication of scattered infestations to be difficult, so potential improvements could include indicators/measures such as reductions in herbicide use over time.

## **2.3 Manage core infestations and research investigations**

### ***Core infestations in the Hunter region are prioritised based on potential for impact and further spread***

Alligator weed core infestations in the Hunter were assessed and prioritised based on criteria of risk of further spread, potential threat to ecological assets and management feasibility (as per strategy item 2.3.1). A technical assessment panel utilised an assessment framework, combined with expert opinion, to identify the priority catchment management units (see map 1) for strategic alligator weed management based on the above three criteria. Results from previous projects, including the risk assessment of potential for further spread and threat of widespread weeds to biodiversity in the Hunter region, were reviewed and used by the technical panel during the project. The results of this project will be used by stakeholders to guide future investment into on-ground works to achieve improved asset protection and to reduce the risk of further spread of the Hunter alligator weed core infestation.

A similar process for the Sydney basin (Australia's other core infestation) will be implemented in 2009/2010.

Funding: Defeating the Weeds Menace & Hunter Councils.

### ***Potential alligator weed biocontrol agents - update***

Work has commenced on testing the host specificity of a fourth biological control agent, the beetle *Systema nitentula*. The presence of several closely related native species to alligator weed makes finding a host specific agent more difficult, however there are four further potential agents and a pathogen (rust fungus) that will be tested if funds can be obtained and this group may contain a host specific agent.

Funding: Australian Weeds Research Centre, CSIRO Entomology

***Genetic analysis to determine the origins of alligator weed continues***

Genetic analysis of alligator weed plants from around the world continue with the aim of identifying the number of genotypes in Australia and their origins. This is vital for selecting potential biocontrol agents. Preliminary results from 2007/2008 research indicated that Australia's alligator weed was from at least three sources. This work was conducted by NSW DPI under contract to CSIRO and final results are expected in 2009/2010

Funding: CSIRO Entomology, Defeating the Weeds Menace

***Herbicide studies identified the need to manage plant fragmentation in water***

Additional research by Vic DPI shows viability of alligator weed fragments following herbicide treatment of large patches (>5m<sup>2</sup>) can amount to around 70% with both metsulfuron-methyl and glyphosate biactive formulations. Anecdotal evidence suggests survivability of fragments decreases with decreasing patch size, which may be due to better herbicide coverage. These results are of particular concern and demonstrate a need for non core alligator weed control programs to prevent downstream spread by utilising either containment barriers when applying herbicides to large patches or manually removing plant fragments. Vic DPI also looked at steam treatment of large patches, which resulted in low fragment viability but was considered impractical for most sites. Future research efforts will look at efficacy of hand removal.

Funding –DPI Victoria, Melbourne Water

***Efficacy studies on surfactants and additional herbicides aim to identify improved herbicide performance for outlier infestation containment/eradication.***

Biosecurity Queensland commenced efficacy trials to determine if additives (i.e. bonus) can improve efficacy of metsulfuron-methyl. In addition, trials commenced to benchmark the efficacy of the widely available 'arsenal express' (glyphosate and metsulfuron-methyl mix) against metsulfuron (existing best practice herbicide recommendation). Results from this study are expected in 2009/10.

Funding: Biosecurity Queensland

***Integrating herbicides and grazing studies demonstrate it can reduce impact of terrestrial alligator weed in core infestation areas***

A joint study by CSIRO and NSW DPI have identified an integrated herbicide and grazing regime that can reduce the impact of terrestrial alligator weed on pastures in the Hunter region. The experiment trialled the integration of a selective herbicide (metsulfuron-methyl) and mowing (to simulate grazing) along a moisture gradient and demonstrated that such an approach can result in a change in alligator weed coverage from 90% to 10% resulting in 90% pasture cover. In addition the project partners also began an experiment on the forage quality of alligator weed with results expected to help determine benefit cost ratios of controlling terrestrial alligator weed in pastures.

Funding: Defeating the Weeds Menace, CSIRO, NSW DPI and Port Stephens Council

### ***The concept of utilising UAV for alligator weed surveillance***

The University of Sydney completed a one year study into the feasibility of using Unmanned Aerial Vehicles (UAV) for alligator weed surveillance. Result demonstrated that the vehicles imaging system combined with the algorithms could, in trial situations, detect alligator weed amongst surrounding vegetation. However, the UAV's control system and autopilot proved to be complex and further development would be required to enable such a platform to perform autonomous surveys in field situations.

Funding: University of Sydney, Defeating the Weeds Menace

### ***Unsuccessful research funding applications***

Several alligator weed research funding applications were submitted to the Australian Weeds Research Centre and Caring for our Country but were unsuccessful. These applications related to:

- refinement of herbicide and non-herbicide options to improve alligator weed eradication techniques
- national aquatic weeds research forum
- further development of the UAV concept.

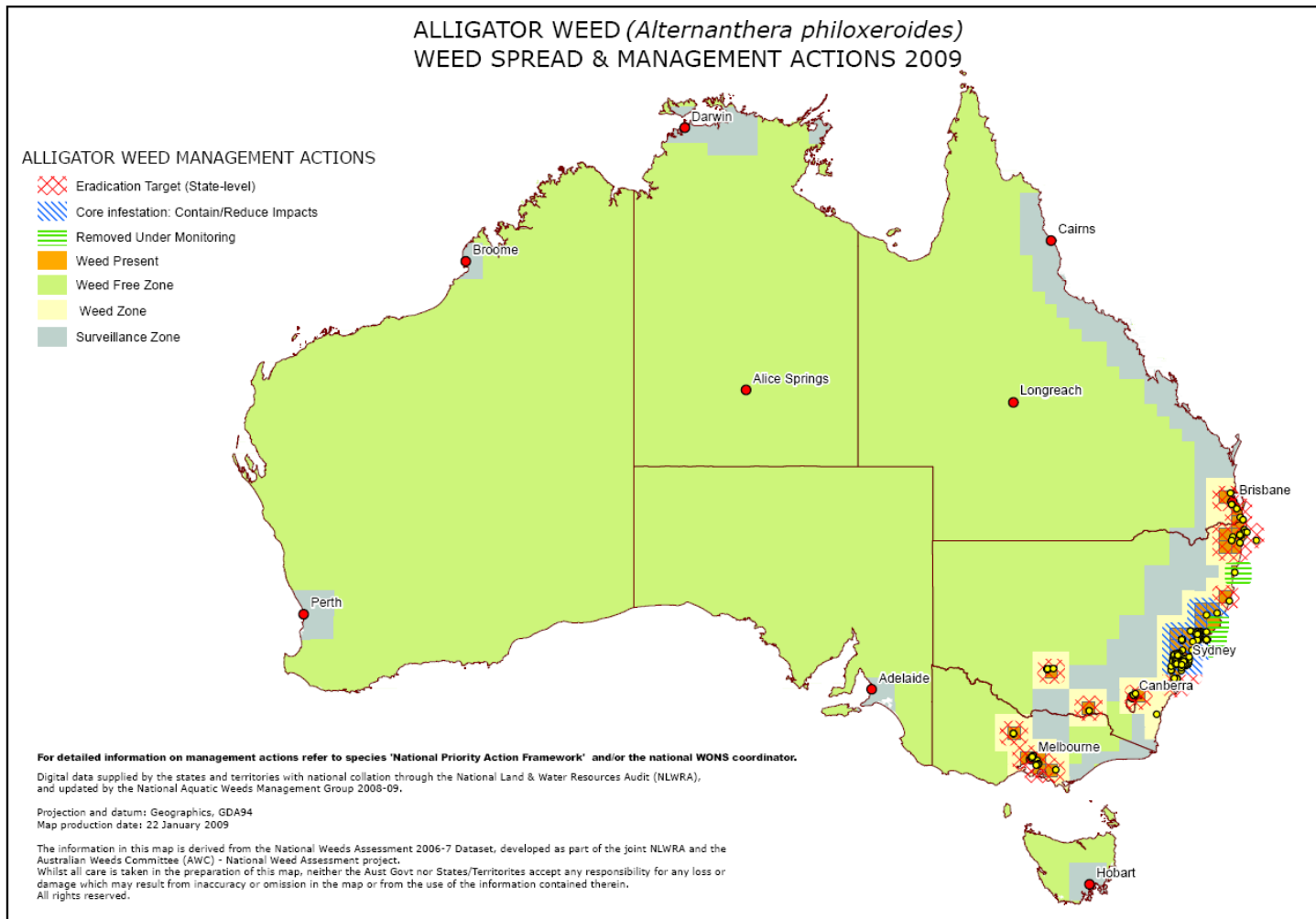
### ***Discussion***

With improved strategic direction in core areas (as a result of the above detailed/mentioned planning processes) and availability of best practice methods it is hoped there will be reductions in the risk of further of alligator weed and protection of key ecological assets from alligator weed in both the Sydney and the Hunter regions (as per strategy goals 2.3.1 and 2.3.2). Managing the core alligator weed infestation will remain a complex task due to a combination of well entrenched infestations and the difficulties faced coordinating over 30 local weed control authorities. However it's important that authorities support and adopt the recommended strategic approaches and Regional alligator weed committees will be critical to ensure this happens.

There is a clear need to refine herbicide and non-herbicide eradication methods and to develop improved eradication strategies. Given the considerable investments in outlier management and the risks these infestations pose, the development of more affordable and effective eradication strategies is critical to the future success of the alligator weed national strategic plan.

In addition NAWMG continue to state the need to quantify the economic and environmental impacts of alligator weed and other high priority weeds. Such information is necessary to improve the knowledge base allowing for better decision making.

## Attachment A – National Alligator Weed Map and key priority management actions



**Attachment B – Status of Alligator Weed Outlier Infestations 2008-2009**

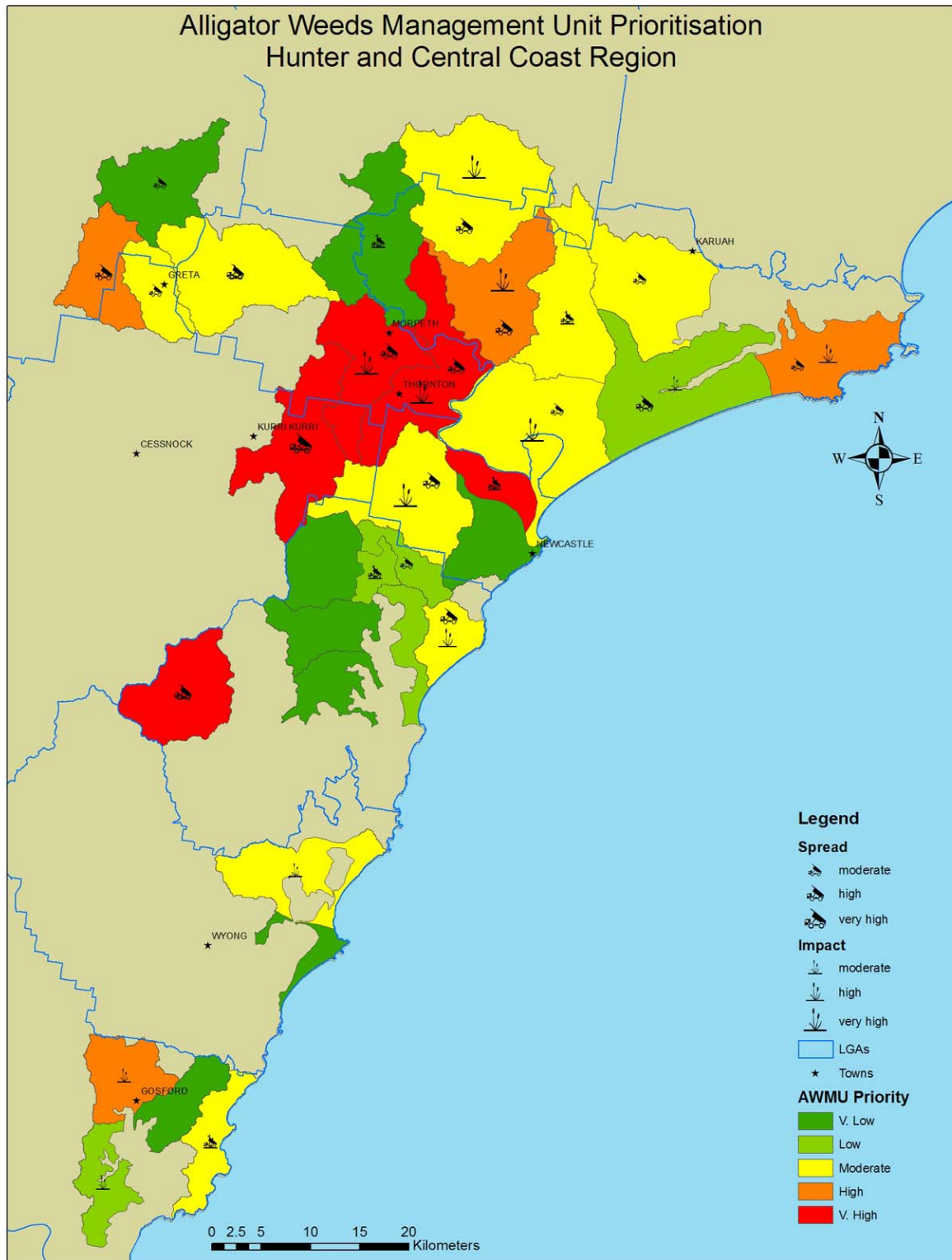
Site name	State	Date detected & size	*Status 2007/2008	*Status 2008/2009	Comments
Lake Ginninderra	ACT	2003 – small patches	Isolated plants/patches	Isolated plants/patches	No further sites found
Yerrabi Pond	ACT	2003 – small patches	Isolated plants/patches	Isolated patches/plants	No further patches/plants found
Barren Box Swamp	NSW	1994 – 250ha	4 plants	TBA	
Casino	NSW	2005 – 15m <sup>2</sup>	<1m <sup>2</sup>	<1m <sup>2</sup>	Regrowth from 1 patch
Cessnock	NSW	1999 – small patches along 200m of creek	Small patches along 2km	Small patches along 2km	Infestation has spread to the Hunter River – now considered as part of the core infestation and will not be reported on further
Coffs Harbour	NSW	2005 – Scattered <5m <sup>2</sup>	Scattered plants (<1m <sup>2</sup> )	No plants detected	Chem/phys destroyed – site under monitoring
Girvan	NSW	1996 – 30m <sup>2</sup>	Scattered plants along 8km	Scattered plants along 8km	One spray during year and hand removal of upstream sources
Hawkes Nest	NSW	2007 – 10m <sup>2</sup>	10m <sup>2</sup>	Nil	Inspected twice during 08/09 – no plants found
Lismore Lakes	NSW	2007 – 20m <sup>2</sup> 3 patches	20m <sup>2</sup>	1m <sup>2</sup>	One patch found
North Arm Cove	NSW	2007 – 10m <sup>2</sup>	10m <sup>2</sup>	Nil	Inspected twice during 08/09 – no plants found
Port Macquarie	NSW	2005 – 30m <sup>2</sup>	Scattered plants (<1m <sup>2</sup> )	6-8 small areas of concern where plants are found (less than 1m <sup>2</sup> )	Site inspected each 6-8 weeks with emerging plants hand removed.
Taree	NSW	2006 – 20 plants	15 Plants	60-70 plants within 30m x 5m area	3 treatments but plants still persist at site. Plans to use solarisation (plastic sheets) in 09/10
Wah Wah	NSW	1994 – >1 ha at 9 properties	60m <sup>2</sup> at 9 properties	Approx 50m <sup>2</sup> at 8 properties	Drought conditions may be hiding many plants
Wilson's River	NSW	1998 – 450m <sup>2</sup> over 40km	>1ha scattered along 75km of river and Berrima swamp	85m <sup>2</sup> over 75km 4000m <sup>2</sup> in Berrima swamp	
Wollongong (Duck Ck)	NSW	1999 – 0.5ha	Scattered plants along 0.5ha	Scattered plants along 0.5ha	Density approx 1% along 500m watercourse. Less herbicide and man hours used indicates reduction in size during 08/09
Woodburn/Broadwater	NSW	October 2008 – 120m <sup>2</sup>	NA	120m <sup>2</sup> across 46 sites	2 river clumps removed

Site name	State	Date detected & size	*Status 2007/2008	*Status 2008/2009	Comments
Woomargama	NSW	Pre 1980 – 30m <sup>2</sup>	4 patches along 3km	4 patches along 3km	Small plants only.
Beenleigh	QLD	Pre 2000 – 0.5ha	0.1ha	0.1ha	No change in area – control program still utilising glyphosate but site contained.
Caboolture	QLD	1994 – 1ha	1ha	1ha	No change in area – control program still utilising glyphosate but site contained.
Currumbin	QLD	2006 – 0.5ha	50m <sup>2</sup>	10m <sup>2</sup>	Scattered plants across site. Several areas fenced to help with containment. Some Infestations due to be mechanically removed.
Bullock Head Creek	QLD	2008 – TBA	NA	TBA	New infestation discovered. Exact size to be determined.
Mudgeeraba	QLD	2006 - 1ha	1ha	TBA	Extent of current infestation to be determined in August 2009 but is likely to have expanded.
Rocklea	QLD	1994 – 1ha	1ha	1000m <sup>2</sup>	Herbicide changed to Metsulfuron resulting in 90% reduction in areal cover.
Bendigo creek	VIC	1997 – 10m <sup>2</sup>	No plants found	2 infestations, approx 10m <sup>2</sup>	Infestations in the creek have reappeared – both infestations due to be mechanically removed in 09/10. Backyard infestations have shown no regrowth after past treatments. Extensive surveys have taken place upstream and downstream and have included Kow swamp hundreds of km downstream from this infestation. No further infestations have been located.
Darebin Creek	VIC	2005	Creek extensively surveyed resulting in 22 plants, approx 0.174 ha of infested area being recorded. 70% of infestations were treated.	22 plants, approx 0.174 ha	A boom placed above the known uppermost infestation is regularly inspected for fragments to ensure that it is the uppermost infestation. There are several Bioscience research sites investigating chemical vs. removal by hand treatment. These infestations will be treated chemically in 09/10.
Edgars Creek	VIC	2008	Removal by hand of	Some infestations	These infestations are a priority for treatment

Site name	State	Date detected & size	*Status 2007/2008	*Status 2008/2009	Comments
			all infestations located.	reappeared. The maintenance staff removed biomass which gave a false impression of infestation absence.	during 09/10.
Merri Creek	VIC	2004	Creek extensively surveyed resulting in 48 plants, 0.0174 ha. Approximately half the infestations were treated.	66% of infestations treated by removal by hand.	The strategic treatment methodology of working from the uppermost infestation towards downstream was undertaken to ensure an effective approach. There are several Bioscience research sites on this creek investigating chemical vs. removal by hand treatment.
Yarra River	VIC	2004	100	100% of infestations treated chemically.	One infestation was treated via removal by hand where shallow water and accessible banks permitted this method.
Eumemmering Creek and Hallam Drain (including Frog Hollow).	VIC	2002	91 infestations, 0.39 ha	1 infestation of approximately 100 individual plants was chemically treated.	Chemical treatment of the Eumemmering Creek is planned for 09/10. The Hallam Drain is an ecological asset due to the presence of Dwarf galaxias a vulnerable and rare fish. As such chemical treatment of the Hallam drain is not an option. Manual removal such as by hand will take place during 09/10.
Sandown	VIC	2009 – 2.5 ha	NA	2.5ha	This is the largest infestation in Victoria to date. Several treatment options are currently being investigated.
Warragul	VIC	2007 – 10m <sup>2</sup>		Terrestrial and aquatic infestation. The aquatic infestation consisted of 7 individual plants; the terrestrial infestation consists of 53 individual plants. 100% treated.	The aquatic infestations were removed manually by hand and mechanically through excavation. The terrestrial infestations were and will continue to be treated chemically.

\* indicates the amount of alligator weed found during 2008/2009.

**Attachment C - Priority catchment management units for alligator weed management in the Hunter region to prevent further spread and protect key ecological assets.**



The most recent data available have been used in the compilation of this map. Whilst every effort has been made to ensure the accuracy of the information content, Hunter Councils Inc. accepts no responsibility for any actions either taken or not taken on the basis of the information contained in this map. June 2009



## Attachment D – National Aquatic Weeds Management Group (as of 30 June 2009)

### Membership group

Organisation	Name
Community (Hunter)	Margaret McMahon
CSIRO Entomology	Shon Schooler
Pet Industry Association of Australia	Ed Frazer
Community (Noosa & District Landcare Group)	Phil Moran
NSW Department of Primary Industries	Syd Lisle
Biosecurity Qld (Department of Primary Industries)	Joe Vitelli
Department of Primary Industries (Victoria)	Tony Dugdale
Community (Hawkesbury/Nepean)	Neale Tweedie (Chair)
Local Government	Paul Rasmussen

### Technical advisors

NSW Department of Primary Industries	Jessica Grantley
Maitland City Council	Brian Worboys

### Coordinator

NSW Department of Primary Industries	Andrew Petroeshevsky
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### Corresponding members

Department of Water, Land and Biodiversity Conservation (SA)	Shauna Potter
Nursery and Garden Industry Australia	Robert Chin
ACT Parks, Conservation and Lands	Stefanie Straub
Department of Agriculture and Food (WA)	Sandy Lloyd
Department of Primary Industries, Water and Environment (Tas)	Vacant
Department of Natural Resources, Environment, Arts and Sport (NT)	Steve Wingrave

**Attachment E – Financial Reporting Table for Aquatic WoNS management (Alligator Weed, Cabomba and Salvinia)**

<b>2008-09</b>		<b>Planned budget</b>		<b>Actual Expenditure</b>	
<b>Employees &amp; Positions Held</b>	<b>Recipient's Contributions (without GST)</b>	<b>Funds paid by the Commonwealth (without GST)</b>	<b>Recipient's Contributions Expended (without GST)</b>	<b>Commonwealth Funds Expended (without GST)</b>	
Co-ordinator salary and on-costs		98,400		98,400	
NSW DPI Management, admin support, research officers	83,500		83,500		
NAWMG, NRM groups, state /territory community support inputs	31,900		31,900		
<b>A Total Employment Costs</b>	<b>\$114,300</b>	<b>\$98,400</b>	<b>\$114,300</b>	<b>\$98,400</b>	
<b>Operating Cost Items</b>	<b>Recipient's Contributions (without GST)</b>	<b>Funds be paid by the Commonwealth (without GST)</b>	<b>Recipient's Contributions Expended (without GST)</b>	<b>Commonwealth Funds Expended (without GST)</b>	
Management Group, travel & meeting expenses	33,200	44,600	33,200	44,600	
Regional alligator weed planning (local councils)	10,000	10,000	5,000	10,000	
General operating costs and extension	8,200	14,200	8,200	14,200	
<b>B Total Operating costs</b>	<b>\$51,400</b>	<b>\$68,800</b>	<b>\$46,400</b>	<b>\$68,800</b>	
<b>C Total Cost (without GST) (A+B)</b>	<b>\$165,700</b>	<b>\$167,200</b>	<b>\$160,700</b>	<b>\$167,200</b>	
<b>D GST (10%)</b>	<b>\$16,570</b>	<b>\$16,720</b>	<b>\$ 16,070</b>	<b>\$16,720</b>	
<b>E Total Cost (including GST)</b>	<b>\$182,270</b>	<b>\$183,920</b>	<b>\$176,770</b>	<b>\$183,920</b>	