

# REGIONAL WEED MANAGEMENT PLAN

## 1.1 PLAN TITLE: Southern Sydney Alligator Weed Management Plan

### 1.2 PLAN PROPONENTS

Regional Weeds Advisory Committee: **South West Sydney Regional Weeds Committee**

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Signature: Chairman:..... Date: .....

### 1.3 NAME OF PLANT(S)

**WONS Y**

Botanical name(s): *Alternanthera philoxeroides* ..... Common name(s): **Alligator Weed**

### 1.4 PLAN PERIOD (not to exceed five years)

Starting date: **July 2002**

Completion date: **June 2007**

### 1.5 AREA OF OPERATION:

This plan extends over the geographical area of southern Sydney, incorporating the South West Sydney and Sydney Central Regional Weeds Committee regions. This area also falls within the regions covered by the Sydney Harbour, Southern Sydney and Hawkesbury Lower Nepean Catchment Management Boards (CMBs).

### 1.6 AIM:

To control and prevent the spread of Alligator Weed in Southern Sydney to protect environmental, commercial and recreational resources.

### 1.7 OBJECTIVES:

1. maintain regional up-to-date maps/records of Alligator Weed infestations.
2. continually suppress and contain Alligator Weed in core areas resulting in a net 10% reduction over the life of the plan.
3. continually suppress and contain Alligator Weed in marginal areas resulting in a net 20% reduction over the life of the plan.
4. make every effort to eradicate Alligator Weed in areas where it is rare and isolated, especially in areas with high risk of establishment and potential impact.
5. treat all new infestations within 14 days of discovery
6. implement awareness raising and education activities to increase knowledge and identification of Alligator Weed.

## **2.0 STAKEHOLDERS**

Signatories and other stakeholders include:

- the Local Control Authorities (LCAs) of Bankstown, Camden, Campbelltown, Fairfield, Liverpool, Sutherland and Wollondilly in the South West Sydney region;
- the LCAs of Ashfield, Botany Bay, Canada Bay, Canterbury, Hurstville, Kogarah, Leichhardt, Marrickville, Randwick, Rockdale, Strathfield, and Waverley in the Sydney Central region;
- the government agencies Dept of Primary Industries (DPI), Dept of Environment and Conservation - Park Services Division (DEC), Sydney Water Corporation (SWC) and the Department of Defence;
- Hawkesbury River County Council (HRCC), Hawkesbury Nepean Aquatic Weeds Taskforce (HNAWT), Chipping Norton Lakes Authority (CNLA), and
- Private landholders and the community.

## **3.0 BACKGROUND and GENERAL FACTS**

### **3.1 Weed Biology/Ecology**

Alligator Weed is a creeping, low growing perennial which dies down in winter, with the main growth period being from September to late Autumn. It can be identified by the presence of a hollow stem, bright green spear shaped leaves in opposite pairs along the stem, and small white papery ball-shaped flowers on a short stalk, flowering in late spring to autumn. Stems may at times be red in colour.

The weed has a broad environmental range and is well adapted to growing in a range of aquatic and terrestrial situations, including damp land, occasionally flooded land, shallow water (rooted in the substrate), deep water (attached to the bank) or free floating. In the aquatic environment, it forms dense mats or 'rafts' over the water surface and scrambles up the banks. The roots are either fibrous, taking nutrients directly from the water, or consist of thick knotty root systems in the soil. Once the weed has established a deep extensive root system, it is very difficult to eradicate.

It is thought that Alligator Weed first arrived in Australia in 1946 at Newcastle Harbour, NSW, in ship's ballast from South America. It subsequently spread in NSW, and then to other States. It was first recorded in the Sydney basin in 1969 at Duck Creek, Auburn and from there it has spread throughout the Sydney region, particularly in the Parramatta River, Georges River and Hawkesbury Nepean catchments, and the Botany wetlands.

### **3.2 Method of Spread**

Alligator Weed does not produce viable seeds in Australia. Instead, it spreads rapidly by vegetative means, with roots developing at stem nodes. Broken segments of the plants also spread via waterways, machinery or people to form new infestations elsewhere. It can establish in a wide variety of habitats from rivers, creeks, floodplains, wetlands and dams to drainage lines, stormwater channels, parks, sportsfields and suburban backyards. It can even grow in protected marine environments such as Sydney Harbour, above the high tide mark.

The spread of the weed through human activity occurs both inadvertently in the course of normal commercial and recreational activities, and intentionally as a food and aquarium plant. The use and movement of cars, trucks, earthmoving plant, boats, soil, dredgings, mulch and green waste, all have potential to be contaminated with Alligator weed fragments, and need to be inspected and/or washed down before leaving a suspect site.

### **3.3 Description of the problem**

Alligator Weed has been described as one of the worst aquatic weeds in Australia. It spreads and establishes easily in many habitats and is capable of choking rivers and creeks, disrupting water flow and supplies, reducing navigation and recreation values of waterways, and promoting sedimentation. The extensive rafts which cover the water limit light and oxygen exchange, thus reducing aquatic habitat, with the potential to significantly impact upon sensitive ecological communities such as wetlands, riparian zones and waterbird nesting sites. On land, it can invade and affect terrestrial native ecosystems, recreational areas and farm paddocks and crops, often at a significant economic cost. Once detected in an agricultural production system, restrictions on sale or movement of produce may be put in place. It has also been implicated in stock photosensitization after grazing.

In addition, Alligator weed is sometimes confused with a related Sri lankan vegetable, with many Sri lankan people growing this plant in their backyards. The consumption of Alligator weed can potentially damage vital organs.

Alligator weed has proven difficult to control in Australia for a number of reasons. Effective chemical control has been limited to the fully aquatic (free-floating) or fully terrestrial habits of the weed. However, it is commonly found in a semi-aquatic habit with rhizomes rooted in wet sediments, with the extensive stem system spreading out either over the water or across the ground, often in amongst other plants. Limitations on herbicide use in or near water then restrict the control options. Current biological control agents in Australia are also restricted in their ability to perform in all situations, being most effective on aquatic floating plants later in the season.

Once the plant has developed a deep root system, on-going chemical treatment is required for control, however even then it can be very difficult to kill, as it often resprouts. Also, the weed may break up after herbicide spraying and float downstream, exacerbating the problem.

Its natural resistance to herbicides, ability to reproduce from small stems or root fragments and capability of growing in a wide range of environments makes Alligator Weed extremely resilient and difficult to manage. Consequently, 'prevention is better than cure' emphasising the importance of education/awareness activities and the implementation of prevention measures.

### **3.4 Reason for the plan**

Alligator Weed is now widespread across the Southern Sydney region but has the potential to spread much more widely than it currently occurs. This plan provides for a coordinated approach to the control and management of Alligator Weed in the region, in a concerted effort to reduce its environmental and economic impacts. It builds upon the success of the previous Weed Control Plan for Alligator Weed implemented by the South West Sydney Regional Weeds Committee over the years 1999/2000 to 2001/2002, and has been expanded to cover the Sydney Central region. This plan aims to address this issue by containing, reducing or eradicating existing Alligator Weed infestations, and prevent these from expanding and spreading to form new infestations elsewhere.

For the purposes of this plan, two kinds of infestations are identified – core infestations which are defined as areas where Alligator Weed can at best be managed but not eradicated given current methods, and non-core infestations (including both marginal and rare/isolated), those that can be significantly reduced or eradicated within ten years of management (NSW Alligator Weed strategic plan).

The Local Control Authorities involved with this plan are committed to managing Alligator Weed in a coordinated and strategic way, and recognise that if no action is taken, Alligator Weed will continue to spread throughout the region, and eventually to new regions where it is not currently found.

### 3.5 Distribution of Infestations

#### South West Sydney Regional Weeds Committee:

##### **Bankstown LCA**

Alligator Weed is found at 12 locations:

1. Jensen Park, Duck River: One large patch of Alligator Weed 10m\*3m completely covering the aquatic area of the western most point of the creek. Smaller patches of alligator weed also present along banks of creek upstream, 10-20% coverage of aquatic zone.
2. Jocelyn St, Prospect Creek Catchment: A new patch of alligator weed has been detected. This patch has not been picked up in past surveys, therefore it is considered to be a recent occurrence. The length of infestation is approximately 4m\*1m.
3. Lake Gillawarna North Pond, Prospect Creek Catchment: Alligator weed present in several pockets, some up to 40m<sup>2</sup>. Distribution is kept mainly along the edges of the lake due to wind action and shallow water.
4. Lake Gillawarna South Pond, Prospect Creek Catchment: Several large patches of Alligator Weed that are very mobile (ie. move with the wind). Two distinguishably large patches were located near the inlet from Amaroo Reserve and near the narrow section separating the North Pond from the South Pond. The occurrence of Alligator Weed at these locations is most likely due to the slower water velocities at these points.
5. Ashford Ave, Milperra Drain Catchment: Alligator Weed is present approximately 50m downstream of Ashford Ave bridge and has a scattered distribution for approximately 100m further downstream. Total aquatic zone coverage for this length of infestation is approximately 10%. At the point where Milperra Drain meets Bankstown Golf Course, there is a larger infestation of Alligator Weed, approximately 50m<sup>2</sup> in total and covering about 20-50% of the aquatic zone in this area.
6. Kelso Tip, west of bridge: Small patches of Alligator Weed are present along the banks of the streams covering approximately 10-20% of the aquatic zone.
7. Kelso Tip, east of bridge: From the bridge, Alligator Weed extends upstream to the marsh casuarina dominated area. Creek coverage is close to 100% and extremely large infestations are present in the marsh area. Total coverage east of the bridge in Kelso Tip of Alligator Weed is expected to be over 3000m<sup>2</sup>.
8. Killara Ave, Kelso Creek Catchment: 20-50% coverage of Alligator Weed from Killara Ave to Horsley Rd and a little beyond.
9. Newlands Reserve: Large amounts of Alligator Weed and Salvinia are present here. Alligator Weed is present along the banks throughout the entire park and on the central island. A large clump of Alligator Weed is present near the pedestrian bridge at the north-western end of the reserve.
10. Lucas Creek: Alligator Weed is present in the middle section of this creek, spanning approximately 50-80m. Coverage of Alligator Weed is between 10-30% of the aquatic zone.
11. Montgomery reserve to Virginius Reserve: Alligator Weed is present in patches along this section of creek.
12. Deepwater Park: 175 \* 30m. 50% of this is on Council land, 50% on private property.

##### **Camden LCA**

Alligator weed occurs along the length of the Nepean River. These infestations are predominantly small, attached infestations, less than 1m<sup>2</sup> in area. Large infestations exist at the confluence of the river and Matahil Creek, and in two 'bays' immediately upstream of Sharpes and Cobbitty weirs.

The section between Sharpes and Cobbitty weirs is the most infested part of the river. These infestations exist on private property, though Council performs the control work in accordance with Subsection 17 (5) of the Noxious Weeds Act 1993. These treatments are conducted in cooperation with Wollondilly Shire Council, as the river forms a significant part of the border between the LGA's.

A large infestation exists on recently acquired Council land, on which a functioning dairy occurs. This heavy infestation is on a dam approximately 1.6 Ha in size, which frequently dries out during periods of low rainfall.

Alligator weed infestations also occur on 30 private properties in the Catherine Field/Leppington area, in the catchments of Kemps, Bonds and Rileys Creeks, the latter being a tributary of South Creek. The weed is also present in road culverts associated with these creeks.

### **Campbelltown LCA**

Alligator Weed infestations are concentrated in the Georges River Catchment however numerous small infestations have been found in the Hawkesbury Nepean Catchment on the Nepean River above Menangle Weir.

Within the Georges River Catchment Alligator Weed occurs at:

1. The Georges River from Simmos Beach, Ingleburn to the boundary of Campbelltown's LGA at Glenfield Causeway, Glenfield. Alligator Weed infestations occur sporadically along this section of the Georges River for approximately 3 kilometres.
2. Bunbury Curran Creek, a tributary of the Georges River for approximately 2 kilometres.
3. Bow Bowing Creek and associated tributaries. The actual extent of infestation is unknown at this stage.
4. Redfern Creek, Minto and Macquarie Fields. There is a significant infestation of Alligator Weed in Redfern Park, particularly at Milton Park, Macquarie Fields where aquatic and terrestrial forms of Alligator Weed have been observed.
5. Macquarie Creek, Macquarie Fields. There is a significant infestation in the section of the creek between James Meehan High School and Glenquarie Shopping Centre.
6. Kayess Park, Minto. Alligator Weed has recently been observed in the drainage line next to Kayess Park, Minto.
7. Treelands Walk, Ingleburn. There is a significant infestation at Treelands Walk which has persisted for several years despite treatment.

All of the above infestations are considered to be marginal as they can be reduced through the implementation of adequate chemical, biological, mechanical and human management strategies.

In addition, Alligator Weed also occurs on privately owned land at Macquarie Road, Ingleburn. This infestation consists of terrestrial Alligator Weed only and is considered to be an isolated infestation.

### **Fairfield LCA**

The main sites of Alligator Weed infestation occur at:

1. De Freitas Wetland (Vine Street, Fairfield) NB: weed has been eradicated from the area with negligible regrowth occurring.
2. Prospect Creek (Market Street to Chipping Norton Lake) NB: Weed is terrestrial only from Waterside Crescent to Chipping Norton Lake.
3. Orphan School Creek (Hawkesbury Street to the confluence of Prospect Creek).
4. Green Valley Creek (Infestations at Chisholm Park, Canley Vale Road, Tenella Street and Swagger Place).
5. Henty Creek (2 sites along North Liverpool Road, Bonnyrigg)
6. Wilson Creek (1 site at Bonnyrigg Park, Bonnyrigg).
7. Cabramatta Creek (Elizabeth Drive to Chipping Norton Lakes) NB: Weed is terrestrial only from Hume Highway to Chipping Norton Lake.
8. 6 terrestrial sites and 5 drainage channels throughout the L.G.A.

## **Liverpool LCA**

Alligator Weed infestations exist over the major creek and river systems on both private and council land.

In the Hawkesbury Nepean Catchment, Alligator weed is found in Badgery's Creek, South Creek, Cosgrove Creek, Oaky Creek and Kemps Creek, varying from core, to marginal, to isolated. The infestation on South Creek stretches over 6 kilometres and is bordered by private land on both sides. The tributaries south of Fifteen Avenue are generally in a better condition.

The Georges River Catchment, including Georges River, Cabramatta Creek and Brickmakers Creek, has marginal and isolated infestations. Cabramatta Creek, the boundary with Fairfield LGA has 90% of the infestations as attached floating mats.

## **Sutherland LCA**

Alligator Weed infestations occur along freshwater creeks, drainage outlets and along drainage lines. Most of the infestations identified so far are on Council managed land, although some smaller infestations have been identified on private properties.

Known Alligator Weed locations:

1. Drainage outlet, corner of Verona Range & Cremona Road, Como, (approximately 40m<sup>2</sup>, scattered);
2. drainage outlet, corner of Ferry Road & Griffin Parade, Illawong, (approximately 40m<sup>2</sup>, scattered);
3. Carina Bay Reserve, Como (approximately 40m<sup>2</sup>, scattered);
4. Bottle Creek, Willandra Parade, Heathcote (scattered along creek line);
5. Woolooware Golf Course (approximately 60m<sup>2</sup>) in a swale drain under a stand of She-Oaks;
6. Private Property, corner of Oak Road & Princes Highway, Kirrawee (approximately 40m<sup>2</sup>) on a vacant block of land in a disused brick pit.

Sites 1 to 4 are on Council managed land in areas of native vegetation.

## **Wollondilly LCA**

Alligator Weed is restricted to mostly isolated infestations, with a couple of marginal sites, on public land along the Nepean River from Menangle downstream to the boundary with Camden Council. These infestations occur both in the river and along the riverbank, with no terrestrial infestations recorded. Mapping of these infestations has been undertaken.

## **Dept of Environment and Conservation, Park Services Division, Sydney South Region**

Alligator weed is found in Yeramba lagoon, Picnic Point. This is a 4 Ha lagoon, which was previously tidal. High tides introduced Alligator weed from the Georges River into the lagoon, and is now present as attached mats over much of the lagoon. At the northern end of the lagoon are residential properties and a Sydney Water sewerage line, which frequently discharges during wet weather. Therefore, it has a serious nutrient overload problem, resulting in heavy infestation levels at the northern end, which diminish southward.

## **Dept of Environment and Conservation, Park Services Division, Cumberland South Region**

Small to medium sized, attached infestations of Alligator Weed are found along the Nepean River, in the Bents Basin State Recreation area.

## *Sydney Central Regional Weeds Committee*

## **Ashfield LCA**

Alligator Weed has been found in the past on private properties where it has been mistakenly grown as the herb Mukunawanna – mainly units, so contained.

### **Botany LCA**

Alligator Weed has been identified in a couple of the ponds in Sir Joseph Banks Park, Botany near the Tupia Street entry. Other than that, no other mapping has been undertaken.

### **Canada Bay LCA**

An isolated infestation exists in Iron Cove at Half Moon Bay, Drummoyne.

### **Canterbury LCA**

Significant infestations occur along Wolli Creek, Earlwood (boundary with Rockdale Council). A small isolated population is present in a dam at Turrella Park, near end of Finlays Ave, Earlwood.

### **Hurstville LCA**

There are 6 known locations of Alligator Weed:

- Marine Drive Reserve, Oatley - tidal area. House-sized area infested, has been treated. Area barricaded and regularly monitored by staff.
- Oatley Park, Oatley - grass strip above tidal baths.
- Peakhurst Foreshore, tidal area in bushland below housing in Rainbow Parade.
- Robyn Street, Peakhurst - residential nature strip was completely covered, but has been sprayed and controlled.
- Riverwood Wetlands, William Road, Riverwood - small occurrence.
- Edith Bay Wetlands. New infestation found in 2003.

All sites have been treated. As at September 2004 all appear to be eradicated and will be monitored regularly.

### **Kogarah LCA**

One infestation in artificial wetland at Moore Reserve, Oatley.

### **Leichhardt LCA**

A bit of Alligator Weed occasionally occurs on the beach at Callan Park, Lilyfield (washes over from Canada Bay infestation).

### **Marrickville LCA**

No recent infestations. However, previous isolated infestations located adjacent to Cooks River, where it runs through Tempe, Marrickville and Dulwich Hill.

### **Randwick LCA:**

One infestation of Alligator Weed at Little Bay which was controlled in 2000. The plant has not re-infested.

### **Rockdale LCA**

Significant infestations occur along Wolli Creek, Turrella (boundary with Canterbury Council). Has also been reported to be in sportsfields near the Rockdale Wetlands and in Scott Park, San Souci.

### **Strathfield LCA**

The weed has occasionally been seen in the only natural bank sections of the Cooks River through the Strathfield golf course, around Augusta St/Hedges Ave, Strathfield.

### **Waverley LCA**

Alligator Weed is growing in mown grassy area at the northern end of Bronte Beach near the surf club, along the coastal walking track.

### **Dept of Environment and Conservation, Park Services Division, Sydney Central Region**

The weed is growing along the creeklines behind Congwong and Little Congwong Beaches in Botany Bay National Park, La Perouse.

It has also been found growing in Sydney Harbour National Park at Vaucluse, just above the high tide mark, but is no longer present.

### **Sydney Water**

Significant infestations occur throughout the Botany Wetlands - both aquatic and terrestrial forms.

## **4.0 LEGISLATIVE AND REGULATORY SITUATION**

### **4.1 Current Declaration**

Alligator Weed is a Weed of National Significance (WONS) and is declared noxious in all states and territories of Australia.

Throughout the southern Sydney region, Alligator Weed is declared a W1 noxious weed under the Noxious Weeds Act (1993). A W1 weed is one which is a threat to agriculture, the environment or the community and landholders *must notify the Local Control Authority within three days, and fully and continuously suppress and destroy this weed.*

All Alligator Weed control will be undertaken in accordance with the Protection of the Environment Operations Act (1997).

### **4.2 Declaration Changes**

No declaration changes are required.

## **5.0 CONSIDERATIONS AND OPPORTUNITIES**

### **5.1 Opportunities to be exploited**

In addition to seeking Group Project Funding with DPI, both regional weeds committees will apply for other funding wherever possible, to assist in the implementation of this regional plan. This includes NHT funding (in particular funding for Weeds of National Significance), and the relevant catchment management boards as funding becomes available to implement their respective Catchment Blueprints.

### **5.2 Species Management**

Alligator Weed is very difficult to control once it becomes established. Various chemical, biological, mechanical and human management strategies are used to control the weed and prevent it from spreading to new areas.

Chemical control is currently the most cost effective management strategy employed. In aquatic situations, eradication is not possible with the currently registered chemical Glyphosate. The use of this chemical has achieved adequate long term management, however the biology of the weed results in a 'burning off' of the plant above the water level. The 'burnt off' portions frequently break apart at the nodes, and disperse, which may be a source of additional infestations downstream. Therefore, this is best conducted with barriers in place to prevent spread, when sufficient resources are available. Glyphosate is not translocated into the roots of the plant, resulting in rapid regrowth in warm conditions. Permits have been granted for off label 'minor use' of other more effective herbicides, though this option is not available where water is used for irrigation, stock or where flow rates cause uncertainty as to the spread of the chemical. Eradication of terrestrial infestations is more easily achieved using Metsulfuron methyl, though this requires applications for at least two years.

Mechanical removal of the weed has been effectively used in the past, though the extensive root system necessitates the removal of a large quantity of the substrate, resulting in severe environmental consequences if used in aquatic situations. The disposal of contaminated material also presents a

barrier. A permit is required to transport W1 weeds, and the weed must be either deeply buried at an approved site, or burned.

The Alligator Weed Flea-beetle, *Agasicles hygrophila*, has proved an effective biological control in aquatic situations, but does not make a significant impact on terrestrial infestations. Other insects subsequently introduced have not proved as successful, though investigations are continuing in Alligator weed's natural range.

Human management strategies are best implemented in conjunction with all three methods above, resulting in an integrated approach to management of the weed. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment.

### 5.3 Extension and Education

Extension and education activities are key components of this Plan and will be delivered through electronic and print media, field days/workshops, contact with landholders during inspections and through the provision of printed material to the general public. The aims of these activities will be to raise awareness of Alligator Weed, improve its identification and provide advice on treatment and prevention measures.

### 5.4 Links to other Strategies

This plan supports the desired outcomes, goals and objectives of the National Weeds Strategy, the National Alligator Weed Strategic Plan and the NSW Weeds Strategy.

The **National Weeds Strategy** has identified 20 Weeds of National Significance (WONS), of which Alligator Weed is one, which: threaten the profitability or sustainability of Australia's principal primary industries, threaten conservation areas or environmental resources of national significance, and require remedial action across several States and Territories.

It also supports and contributes to the implementation of:

- the **Hawkesbury Nepean Alligator Weed Strategic Plan** which was developed by the Hawkesbury Nepean Aquatic Weeds Taskforce, and aims to minimise, and where possible, locally eradicate Alligator Weed in the Hawkesbury Nepean catchment; and
- the draft **Greater Sydney and Hunter Region Alligator Weed Management Plan**, which aims for the effective, integrated management of Alligator Weed in the greater Sydney and Hunter region through collaborative efforts, resulting in reduced infestations and prevention of further spread of the weed, thus protecting natural ecosystems and agricultural production systems and maintaining land and water quality.
- The **Hawkesbury Lower Nepean Catchment Blueprint** developed by the Hawkesbury Lower Nepean Local Government Advisory Group (LGAG), in particular:
  - Management Target 12: Weeds and pests:  
*By 2006 implement adequately funded and closely linked strategies and effective actions plans for all major and potential terrestrial and aquatic weed/pest species; and*
  - Prioritised Management Actions for Biodiversity 6:  
*Resource and implement closely linked strategies and effective action plans developed on a catchment basis for all major aquatic and terrestrial weeds and pests using environmentally appropriate management practices, and develop contingency plans for potential invasive weeds and pests.*
- The **Southern Sydney Catchment Blueprint** developed by the Southern Sydney Catchment Management Board, in particular:
  - Management Target 14:  
*By 2012 the threats posed to aquatic and terrestrial ecosystems by pest species are measurably reduced; and,*

Management Action 18:

*Implement closely linked strategies and effective action plans, supported by government for all major aquatic and terrestrial weeds, pests and pathogens using environmentally appropriate management practices, and develop contingency plans for potential invasive weeds and pests.*

- The **Sydney Harbour Catchment Blueprint** developed by the Sydney Harbour Catchment Management Board, in particular:

Management Action 40:

*Develop and implement integrated pest/weed/pathogen management plans for the Board area (aquatic and terrestrial).*

## **5.5 Barriers and Contingencies**

Effective management of Alligator Weed will be achieved by overcoming the following barriers through the implementation of the respective Actions detailed in Section 6.0:

1. Difficult to control, with a current lack of effective/economic control measures (Action 6.1);
2. Limited resources and need for coordination of control (Action 6.1);
3. Inconsistency of effective weed management on privately owned lands (Action 6.1).
4. Landowner ignorance and complacency (Action 6.2);
5. Lack of awareness of the weed and its effect on the environment (Action 6.2);
6. Ease of spread of the weed (Action 6.3);
7. Full extent of the weed unknown (Action 6.3)

## 6.0 ACTIONS AND PERFORMANCE INDICATORS

| ACTION PLAN FOR CONTROL:  | Performance indicators  | Who                                | Addresses which objectives.   |
|---|---|------------------------------------|---|
| 6.1 Undertake surveys, inspections and monitoring of new and existing infestations on public land, especially at sites previously treated/eradicated.   | Annual inspections undertaken, with maps produced showing extent of core, marginal and rare and isolated infestations.<br><br>Production of maps and records.                         | LCAs, DEC, DPI, HNAWT, HRCC, CNLA. | 1. maintain regional up-to-date maps/records of Alligator Weed infestations   |
| 6.2 Undertake surveys, inspections and monitoring of private properties, especially in high-risk areas, such as those with waterways or near past or present infestations.  | Annual inspections undertaken, with maps produced showing extent of core, marginal and rare and isolated infestations.<br><br>No. of properties inspected compared to previous years. | LCAs                               | 1. maintain regional up-to-date maps/records of Alligator Weed infestations   |
| 6.3 Control and eradicate known Alligator Weed infestations on public land - using integrated best practice management techniques and obtaining EPA licences where required - including the use of biological control. High priority will be given to rare and isolated infestations at risk of spread. | Containment and eradication undertaken each growing season, with following results:<br>* eradication of rare and isolated infestations;   | LCAs, DEC, DPI, HNAWT, HRCC, CNLA. | 2. continually suppress and contain Alligator Weed in core areas resulting in a net 10% reduction over the life of the plan<br>3. continually suppress and contain Alligator Weed in marginal areas resulting in a net 20% reduction over the life of the plan.<br>4. make every effort to eradicate Alligator Weed in areas where it is rare and isolated, especially in areas with high |

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|  | <p>* 20% reduction in marginal infestations; and<br/>* 10% reduction in core infestations.</p> <p>No. of hectares of works undertaken to control or eradicate Alligator Weed.</p>  |   | <p>risk of establishment and potential impact.<br/>5. treat all new infestations within 14 days of discovery</p>   |
| <p>6.4 Notify private landholders whose properties contain Alligator Weed of their obligations to eradicate the weed, provide technical advice and assistance on integrated management, and enforce the Noxious Weeds Act if required.</p> | <p>Containment and eradication undertaken each growing season, with following results:<br/>* eradication of rare and isolated infestations;<br/>* 20% reduction in marginal infestations; and<br/>* 10% reduction in core infestations.</p> <p>No. of letters and notices issued compared to previous years.</p> | <p>LCAs, DPI, private landholders</p>                           | <p>2. continually suppress and contain Alligator Weed in core areas resulting in a net 10% reduction over the life of the plan<br/>3. continually suppress and contain Alligator Weed in marginal areas resulting in a net 20% reduction over the life of the plan.<br/>4. make every effort to eradicate Alligator Weed in areas where it is rare and isolated, especially in areas with high risk of establishment and potential impact.<br/>5. treat all new infestations within 14 days of discovery</p> |
| <p>6.5 Implement training and awareness programs on an annual basis for agency staff to improve detection and control and prevent spread.</p>  | <p>One regional training and awareness program undertaken annually.</p> <p>20 staff trained per</p>  | <p>LCAs, DEC, SWC, RTA, DOD, DPI, regional weeds committees</p> | <p>6. implement awareness raising and education activities to increase knowledge and identification of Alligator Weed</p>  |

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|  | <p>year.</p> <p>Prevention protocols developed and implemented.</p>  |   |   |
| <p>6.6 Undertake public education and awareness raising activities and programs to ensure landowners, especially along rivers, creeks and wetlands are:</p> <ul style="list-style-type: none"> <li>➤ able to identify Alligator Weed;</li> <li>➤ aware of their legal obligations in regard to Alligator Weed control; and</li> <li>➤ willing and able to take appropriate eradication and control.</li> </ul> | <p>Media articles 1 per year per LCA.</p> <p>Regional field day 1 per year</p> <p>No. of aquatic weed brochures distributed.</p> <p>Alligator Weed included in Weedbuster Week displays.</p> <p>Alligator Weed included in regional weeds brochure</p> <p>No. of landowners undertaking control of Alligator Weed.</p> | <p>LCAs, regional weeds committees, DPI, HNAWT, DEC</p> | <p>6. implement awareness raising and education activities to increase knowledge and identification of Alligator Weed</p> |

## 7.0 MONITOR AND REVIEW PROCESS

All participants in this plan will monitor and review the progress of the plan in their area, against the performance indicators during the quarterly committee meetings. This information will also be detailed in the annual Group Project Reports.

Monitoring of infestation sites and follow up treatments combined with the community education component will provide sustainable long-term benefits.

## 8.0 BENEFITS

It is envisaged that the implementation of this regional plan will reduce the significant environmental and economic damage caused by Alligator Weed infestations in the southern Sydney region and prevent the establishment of new infestations.

Controlling Alligator Weed will improve water quality and assist in the conservation of aquatic life and biodiversity in rivers, creeks, wetlands and other riparian environments. It will prevent the reduction in flow rates and increased sedimentation of waterways, ensuring the continual use of waterways for recreational and navigational purposes, and prevent economic losses from the invasion of Alligator Weed in crops and pastures on private land.

Another benefit will be the minimisation of the risk to human health, through a campaign to increase awareness and reduce the use of the plant as a herb in suburban backyards.

## 9.0 RESOURCES

### List of references and further reading:

Agriculture & Resource Management Council of Australia & New Zealand, Australian & New Zealand Environment & Conservation Council and Forestry Ministers, (2000) **Weeds of National Significance Alligator Weed (*Alternanthera philoxeroides*) Strategic Plan**. National Weeds Strategy Executive Committee, Launceston

**Noxious and Environmental Weed Control Handbook-2004/2005** (*A guide to control weed control in non-crop, aquatic and bushland situations*). Published by NSW Agriculture.

NSW Agriculture (1989). Agfact P7.6.46 *Alligator Weed*.

Parsons, W.T. and Cuthbertson, E.G. (1992). *Noxious Weeds of Australia*. Melbourne: Inkata press.

Sainty, G.R. & Jacobs, S.W.L. (1981). **Waterplants of New South Wales**. Water Resources Commission New South Wales.