



# REGIONAL WEED MANAGEMENT PLAN

## 1.1 PLAN TITLE:

**Control of Aquatic Weeds in the Sydney West-Blue Mountains and Sydney North regions**

## 1.2 PLAN PROPONENTS

Regional Weeds Advisory Committees: **Sydney West-Blue Mountains Regional Weeds Committee and Sydney North Regional Weeds Committee**

Address: Hawkesbury River County Council  
P.O Box 6021, South Windsor Delivery Centre NSW 2756

Contact person: **David Karlson**

Telephone number: **4577 5573** Fax: 4577 5653 Email [hrccweed@ihug.com.au](mailto:hrccweed@ihug.com.au)

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

## 1.3 NAME OF PLANTS

**WONS = 3**

Botanical name(s):	Common name(s):
<i>Alternanthera philoxeroides</i>	Alligator Weed
<i>Salvinia molesta</i>	Salvinia
<i>Eichhornia crassipes</i>	Water Hyacinth
<i>Gymnocoronis spilanthoides</i>	Senegal Tea Plant

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

Starting date: July 2006

Completion date: June 2010 (4 years)

## 1.5 AREA OF OPERATION:

This plan covers the land and waterways in the Local Control Authorities (LCAs) of the Sydney North and Sydney West-Blue Mountains regions:

Sydney North region: Hornsby, Hunters Hill, Ku-ring-gai, Lane Cove, Manly, Mosman, North Sydney, Pittwater, Ryde, Warringah and Willoughby Councils

Sydney West-Blue Mountains region: Blue Mountains, Parramatta, Auburn, Holroyd and Hawkesbury River County Council (covering Baulkham Hills, Blacktown, Hawkesbury & Penrith Council areas)

## 1.6 AIM:

The protection of aquatic ecosystems by controlling and preventing further infestations of Alligator Weed, Salvinia, Water Hyacinth and Senegal Tea Plant.

## 1.7 OBJECTIVES:

- To reduce core infestations of the four aquatic weeds (Alligator Weed, Salvinia, Water Hyacinth and Senegal Tea Plant) on public land using biological control, chemical, mechanical and manual removal, as required
- To reduce the incidence and control marginal infestations on public land within 4 years
- To implement a control program on new infestations on public land within 5 working days of detection.
- To increase identification skills and control skills of agency staff and contractors
- To increase the identification skills of Bushcare/Landcare volunteers and landholders and how to report aquatic weed infestations.
- To enforce the *Noxious Weeds Act* so that private landholders control infestations on their land and waterways, and the sale of these aquatic weeds is prevented.

## 2.0 STAKEHOLDERS

### **\*\* Signatories and Key Land Managers who will be critical to the success of this Plan**

Sydney West~Blue Mountains Regional Weeds Committee: ** Parramatta, Blue Mountains, Hawkesbury River County Council (Penrith, Blacktown, Hawkesbury, Baulkham Hills), Auburn and Holroyd Councils	Sydney North Regional Weeds Committee: Hornsby**, Hunters Hill**, Ku-ring-gai**, Lane Cove, Manly**, Mosman, North Sydney, Pittwater**, Ryde**, Warringah** and Willoughby Councils
Department of Environment and Conservation (DEC) – Parks Service (Sydney North, Harbour North, Cumberland Area North, Blue Mountains, Sydney and Hawkesbury regions) **	Department of Infrastructure, Planning and Natural Resources (DIPNR) **
Department of Primary Industries **	Roads and Traffic Authority (RTA) **
Hawkesbury Nepean and Sydney Metropolitan Catchment Management Authorities (CMAs) **	Department of Housing (DOH) **
Department of Lands (DOL) **	Penrith Lakes Development Corporation **
Sydney Water Corporation (SWC) **	NSW Waterways **
Rail Infrastructure Corporation (RIC) **	Department of Defence **
Sydney Harbour Trust **	

### **Other stakeholders**

Private landholders with dams & waterways**	Rural Lands Protection Board
Community based environmental groups	Department of Education, and schools
Universities – Macquarie, UWS	Bushcare and Landcare groups
Metropolitan Lands Council	

## 3.0 BACKGROUND and JUSTIFICATION

### 3.1 Rationale for the Plan

Three of the four aquatic weed species covered in this plan are declared Weeds of National Significance (WONS) due to their severe impacts in freshwater ecosystems, aquatic biodiversity, functioning of wetland and riparian ecosystems, water quality, water storage and distribution infrastructure, recreation and visual amenity values. These high priority aquatic weeds for the Sydney region cover a similar distribution and are generally treated in a similar manner. For maximum efficiency of time and funding, these weeds are generally treated at the same time by LCA's where they are found together in a waterway. This plan provides for a co-ordinated approach, planning of funding applications and grants and on-ground work in order to contain, reduce and where possible, eradicate existing infestations, and prevent these from expanding and spreading to form larger and new infestations.

In this regional plan, three degrees of infestations are referred to:

1. Core infestations - areas where the four aquatic weeds can be, at best, contained but not completely eradicated given current methods within 4 years
2. Marginal infestations - infestations that can be significantly reduced or eradicated within 4 years , and
3. New infestations – new areas that are detected, recorded and treated immediately.

## 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 disrupting water flow and supplies, reducing navigation, promoting sedimentation and affecting recreational values of waterways. The extensive rafts which cover the water limit light and oxygen exchange, thus destroying aquatic habitat. This has the potential to significantly impact upon sensitive ecological communities such as wetlands, riparian zones and waterbird nesting sites. The extensive rafts in water can also create an unsafe swimming environment for humans. On land, it can invade terrestrial native ecosystems, recreational areas, 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. In New Zealand and Australia, Alligator Weed has been implicated in cases of photosensitisation of skin in light pigmented cattle, resulting in cancerous lesions.

Alligator Weed is sometimes confused with a related Sri Lankan vegetable, with some Sri Lankan people growing the weed in Sydney backyards.

Alligator Weed has proven difficult to control in Australia for a number of reasons:

- It is capable of growing in a wide range of environments.
- It has a natural resistance to herbicides. Effective chemical control has been limited to the fully aquatic (free-floating) or fully terrestrial habits of the weed. Where it is commonly found in a semi-aquatic habit with rhizomes rooted in wet sediments, the extensive stem system spreads out either over the water or across the ground, often amongst other plants. In these cases, herbicide use in or near water is restricted and the control options become limited.
- Current biological control agents in Australia are restricted in their ability to perform in all situations, being most effective on aquatic floating plants in warmer seasons.
- Once the plant has developed a deep root system, on-going chemical treatment is required for control. Even then it can be very difficult to kill, as it often re-sprouts.
- The plant can break up after being sprayed with herbicide and plant parts can float downstream, thus exacerbating the problem.

For these reasons, Alligator Weed is extremely resilient and difficult to manage. Consequently, *prevention is better than cure*, which emphasises the importance of education/awareness activities and the implementation of preventative measures.

**Salvinia** has the capacity for rapid growth and can quickly cover large areas of water under ideal conditions. Salvinia has the potential to spread across much of Australia's waterways. It generally grows in water with high nutrient levels in water temperature of around 20 to 30 degrees. Although the plant is frost sensitive it is capable of surviving these conditions. Salvinia is capable of completely covering the surface of water bodies and removing all light to below the surface. This has a huge impact on aquatic biodiversity as all submerged plants and their associated fauna can be killed. Dense infestations greatly restrict river navigation, fishing and recreation, as well as reducing the value of the water body as a source of irrigation and drinking water. Light penetration and oxygen levels are adversely affected, pH levels are reduced, and the weed mass acts as a haven for disease vectors. Salvinia also interferes with the functioning of river control structures, especially during flooding events. Despite being banned throughout Australia, Salvinia is still a popular aquarium and pond plant, from where it can continually re-infest local waterways.

**Water Hyacinth** is a fast growing aquatic weed that prefers to grow in still or slow-moving fresh water in tropical, subtropical and temperate areas. It forms a dense mass and is capable of choking rivers and creeks, restricting river navigation, fishing and recreation values. The dense mass destroys aquatic habitats by depletes the water of oxygen and light, whilst also providing a breeding ground for mosquitoes.

The creation of large rafts of Water Hyacinth can create an unsafe swimming environment for humans. The physical nature of the plant can damage structures such as bridges and dams and clog foot valves of irrigation pumps. Water Hyacinth is sometimes used as an ornamental plant in ponds and dams, where it has been obtained from other locations or commercial businesses illegally selling it. There is an ongoing significant risk that the plant may accidentally or intentionally enter creeks and rivers via the stormwater system, especially after heavy rainfall events. With Water Hyacinth estimated to weigh approximately 400 tons per hectare, the movement of large amounts of plant material has the capacity to build up around infrastructures. Together with the force associated with water flow, this may cause structures to collapse due the weight. Large masses of Water Hyacinth deposited on vegetable and turf growing areas as a result of flooding pose a potential problem and considerable loss of income, these areas can withstand inundation for short periods of time by slow moving water. In narrow sections of waterways, any flooding in the system may be diverted to areas not normally affected, in the worst possible scenario, this could cause the loss of property and endanger animal and human life.

**Senegal Tea Plant** is a highly invasive plant that is difficult to control once established. Infestations are usually as a result of an aquarium escape. Senegal Tea Plant chokes drains and waterways, competes with native riparian vegetation, taints water and produces an objectionable odour from its decaying vegetable matter.

### 3.2 The “Do Nothing” Option

The Local Control Authorities involved with this plan are committed to managing these four aquatic weeds in a co-ordinated and strategic manner. It is recognised by all key land managers that if no action is taken (and/or there is unco-ordinated action), these four aquatic weed species will continue to spread, and eventually infest into waterways where they are not currently found, thus becoming a huge threat to:

- Biodiversity of freshwater ecosystems throughout the whole region
- Economic values of industries and farming that are reliant on healthy freshwater ecosystems
- Recreational values of the Hawkesbury-Nepean and Lane Cover River systems, and surrounding creeks and,
- Public safety and navigational access of waterways.

### 3.3. Distribution of Infestations

**Alligator Weed** is widespread across the Sydney West region and Hawkesbury River, and in recent years, has shown up in Sydney North, including most recently the Lane Cove River. It has the potential to spread much more widely than it currently occurs.

**Locations of the known aquatic weed infestations are provided for most of the LCAs in the regions covered by this plan.**

#### *Hawkesbury River County Council*

- The Hawkesbury River from Menangle (Camden) to Ebenezer (in varying degrees).
- 71 kms of the River from above Wallacia weir to Riverside Ski Park, Ebenezer is being monitored and controlled by Hawkesbury River County Council in cooperation with Blue Mountains City Council and NSW National Parks and Wildlife Service.
- Oakville area, Yarramundi Lagoon, Bushells Lagoon, Cattai Creek, Kemps Creek, Badgerys Creek and South Creek
- Two new infestations were detected in 2004/5 at Colby Reserve and McGraths Hill (Hawkesbury LGA).
- Darling Mills Creek (Baulkham Hills LGA).

### ***Blue Mountains National Park***

- Fitzgeralds Creek to below Yellow Rock and Warragamba River to Glenbrook Creek

### ***Blue Mountains Council***

- Ongoing control program at Glenbrook, downstream of Glenbrook Lagoon.
- New incursion of Alligator Weed in South Katoomba in 2003, has been controlled, now monitored.

### ***Holroyd***

- Upper Pendle Creek from Darling Street Park, Greystanes to the railway line (boundary with Parramatta Council)
- Prospect Creek from Prospect to Fairfield, Upper Finlayson Creek at Central Gardens, Merrylands – recent infestation from down stream which was introduced by water fowl (Ibis).

### ***Hornsby Council***

Four small infestations of Alligator Weed, including at Pennant Hills High School.

### ***Lane Cove National Park and Lane Cove River***

- In 2004-5 an isolated terrestrial infestation was found along the Lane Cove River. The suspected source infestation was later found in the Macquarie University Dam. The terrestrial infestation on Lane Cove River was treated three times in quick succession in the summer of 2004-2005 and CMA funding for 2005-2006 will enable further treatment. The Macquarie Uni dam infestation was treated in early 2005 with good success.
- NPWS staff are monitoring areas between Macquarie University and the Lane Cover River weir.
- Floating infestations and segments were found in the upper reaches of Mars Creek immediately downstream of the university dam and within Macquarie University Estate during an inspection by NPWS and City of Ryde Council staff. NPWS has scheduled a comprehensive survey of the creek where it flows through DEC estate for October 2005 and CMA funding for 2005-2006 will allow for treatment of any infestations found. This program is collaborative between the three agencies.

### ***Sydney Harbour National Park***

An isolated infestation of Alligator Weed at Collins Flat, North Head. NHT funding will be used in 2005-6 to commence treatment.

### ***Ku-ring-gai Council***

No known locations. There is potential for it to spread up stream from the Lane Cove River infestation.

### ***City of Ryde***

- Found in front of dense mangrove/urban vegetation masses along the Parramatta River.
- Several infestations in Council managed parks have been treated in past years and are being monitored for re-infestations
- A new infestation located in Bridge Road (North Ryde) on a Council drainage property next to Shrimptons Creeks.

### ***Pittwater Council***

One known infestation occurring on Narrabeen Creek, which is in an area owned and managed by Council and is undergoing regular treatment.

### ***Parramatta Council***

Infestations in the Parramatta River, Duck River and Toongabbie Creek

***Auburn Council*** Alligator Weed infestations are in open space areas along the full length of the Duck River managed by Auburn Council from Parramatta to Bankstown.

## **Salvinia**

### ***Hawkesbury River County Council***

During the outbreak, in 2004/05, Salvinia extended from above Hawkesbury River County Council's boundary at Wallacia to Lower Portland. The infestation extended some 75km in varying degrees of density, and has been reported as the worst Salvinia outbreak in the Southern Hemisphere. At the height of the infestation, the worst sections were Freemans Reach, above and below Windsor bridge, Yarramundi Lake and between Penrith weir and Devlin Road, Castlereagh. The present infestation is believed to have originated from Duncans Creek in the Liverpool area. This area has been inspected by Liverpool City Council staff and a boom erected to prevent further contamination of the river above Wallacia.

- South Creek from Liverpool boundary (Elizabeth Drive, Kemps Creek) to St. Marys.
- Longneck Lagoon & Cattai Creek (HRCC and DEC-NPWS manage these areas)
- Killarney Chain-of Ponds Creek
- McKenzies Creek
- Currency Creek
- Numerous dams, particularly in the Freemans Reach area.

### ***Blue Mountains Council***

Static infestation in Glenbrook Lagoon

### ***Parramatta Council***

Lake Parramatta and Vineyard Creek

### ***Pittwater Council***

A dense infestation in Warriewood Wetlands

### ***Ku-ring-gai Council***

Small infestations in North Turramurra Golf Course dam, a drainage line in a reserve in Gordon and in a small creek feeding into Lane Cove River.

## **Water Hyacinth**

### ***Hawkesbury River County Council***

- The Nepean River from Fitzgeralds Creek to below Windsor
- Castlereagh and Richmond Lowland areas. Common on Council owned flood mitigation channels in the Richmond Lowlands area, these channels must be maintained on a regular basis as to prevent blockage and siltation of these drainage lines.
- Yarramundi Lagoon
- Several lagoons and creek lines are managed in close proximity to the Hawkesbury River..

### ***Blue Mountains NPWS***

### ***Parramatta Council***

- Duck River and tributaries
- Pendle Creek & Toongabbie Creek

### ***Ku-ring-gai Council***

- Blackbutt Creek along drainage line on firebreak
- Seven Little Australians Reserve creek line

## **Senegal Tea Plant**

It is currently not widely distributed.

### ***Hawkesbury River County Council***

6 known infestations at;

- South Windsor
- Glossodia
- Marsden Park
- Cattai
- North Richmond
- Kurrajong

Two of these infestations have been eradicated by mechanical means to date (@ 2005).

### ***Parramatta Council***

A small and contained infestation on the Duck River at Granville.

### ***Pittwater Council***

A small clump of plants has been found in Ingleside.

### ***Hornsby Council***

There is one known infestation on private land at Sunnyridge Road Arcadia. The infestation is growing around a dam, and Council staff are working with the private landholder.

## **3.4 Weed biology**

**Alligator Weed**, a native of South America, is a stoloniferous perennial free-floating aquatic plant, which is capable of terrestrial growth. Stolons can reach up to 10 metres long with dense mats reaching 15 metres across water surface, rooting at nodes, roots can reach a depth of 1 metre. It can withstand high salinity levels (Sainty and Jacobs, 1981). It grows in static or flowing waters, and damp soils either attached to the bank or floating, or away from water in higher rainfall areas.

**Salvinia**, a native of Central and South America, is free-floating aquatic fern up to 30 cm long, which reproduces by vegetative means. Up to 55 sporocarps in 2 rows may be produced along each segment, the first 2 or 3 are macrosporangia, the remainder microsporangia. The plant appears to be a hybrid and has not been reported to produce fertile spores in this country (a major concern to quarantine if viable spore producing species were to be introduced) (Sainty and Jacobs, 1981). It grows in still or slow-flowing water. This species will not survive in water containing low nutrient levels.

**Water Hyacinth**, a native of the Amazon River basin of South America, is an erect, free floating perennial aquatic plant up to 1 metre high. The plant reproduces vegetatively from stolons, which form roots at the nodes to produce new plants. The majority of growth and flowering occurs during the summer months. Winter frosts will cause leaves to die off, leaving crowns of the plant over winter and commence new growth the following spring. During dry summers and low flows, it is possible that there is an increased loss of water due to evapotranspiration this may allow for the movement of saline water further up stream. Worldwide, it grows in fresh static or slow-flowing water.

**Senegal Tea Plant**, a native of tropical and subtropical America (Mexico to Argentina), has scrambling or erect stems up to 1 metre high. The stems are buoyant enabling them to float. Flowering commences in late spring or early summer and continues until falling temperatures prevent further growth. Plants are dormant during winter, re-shooting from the crown the next spring. It prefers growth in wet marshy soils, still or slow flowing water.

### 3.5. Method and rate of spread

**Alligator Weed** spreads extremely quickly, particularly in nutrient enriched water. The plant is fragile and breaks up easily, these segments float or otherwise distributed to other areas creating new infestations. Flowering and maximum growth occurs in summer, however viable seeds are not produced. The plant reproduces by vegetative means.

**Salvinia** spreads vegetatively by fragmentation and can keep growing from a single node. Each plant is capable of rapid growth, most growth occurs from September to March. The plant is frost sensitive, however, it is capable of surviving these conditions, especially where plants are sheltered by layering or other vegetation. Under ideal conditions, Salvinia can double in size in 2.2 days. Under these conditions, one plant added to a body of water will produce over 8,000 plants within the first month. This amount of Salvinia may go unnoticed in a large body of water. After two months the population has increased to more than 67,000,000 plants, left uncontrolled, by four months there could be in excess of 4,500,000,000,000 plants.

It has been estimated that even under poor growing conditions, a population of Salvinia growing at 5% per day (doubling at about every 14 days) would produce between 45.6 to 109.5 tons/ha/year.

**Water Hyacinth** is capable of living on land if sufficient moisture is available. During summer flowers are produced. Each flower opens for 1 to 2 days before withering. The flower stalks bend into the water and release their seeds. These seeds can germinate in 3 days or remain viable for at least 15 years. Seeds are not an important means of spread. The majority of biomass is produced by formation of daughter plants, one plant can produce as many as 50,000 daughter plants in one season (Dyason, 1987). One hectare of water hyacinth can yield as many as 2,000,000 plants and weigh as much as 400 tonnes (Sainty and Jacobs, 1981).

**Senegal Tea Plant** is an aggressive invader capable of rapid spread, particularly in nutrient enriched water. The plant reproduces by seed and vegetative means.

### 3.6 Species Management

For all four aquatic weed species, there is ongoing investigation by participating LCA's into the available and new control options, in order to reduce dependency of herbicide use in the aquatic environment.

#### **Alligator Weed**

Chemical control – this is currently the most cost effective management strategy. 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 poorly 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 – this has been effectively used in the past. The extensive root system necessitates the removal of a large quantity of the substrate, which can result 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.

Biological control - the Alligator Weed Flea-beetle, *Agasicles hygrophila*, has proved a reasonable 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.

Prevention of spread- this requires the practice of good hygiene of boots, tyres, boating trailers, mowing equipment etc to prevent accidental and intentional spread to un-infested regions, in particular west of the Dividing Ranges. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment.

### **Salvinia**

In order to control Salvinia, an integration of chemical, mechanical and biological control techniques is required.

### Combination of mechanical/manual removal and chemical control

Integrating mechanical/manual methods with chemical and/or biological control, and reduction of nutrient inflows to the water body, can be successful.

### Physical removal

Small isolated infestations can be physically removed however care needs to be taken to remove all plant material to prevent rapid re-infestation.

### Chemical control

This method is more cost effective for large infestations. The NSW Agriculture *Noxious and Environmental Weed Control Handbook* annually lists the current chemicals registered for use.

Chemicals that are available for use on salvinia are listed in the table below.

**NOTE: Users of chemicals should consult websites, product label, DPI handbook, and consult with other Council staff.**

Chemical	Comments relating to control of salvinia
<b>Diquat</b> Reglone®  Vegetrol®	Spray to wet all foliage thoroughly, add Agral 600. <b>Observe withhold period.</b>  Apply as an overall spray, thoroughly wet foliage. Best if water is clean, use higher rate if dense weed or dirt water. <b>Observe withhold period</b>
<b>Calcium dodecylbenzenesulphonate</b> AF-100	Apply 1 litre of mixture to 100 square metres, as per label.
<b>Glyphosate 360 g/L</b> Approved for use in aquatic situations. Various trade names	An Australian Pesticide and Veterinary Medicines Authority Permit is current for glyphosate.
<b>Orange Oil</b> Water Clear®	Spray onto clear water.

Biological control agents - where appropriate this can be an effective method of removing Salvinia. The Salvinia weevil, originally from South-Eastern Brazil has had varied success across Eastern Australia. There have been cases in the Richmond and Clarence River systems in northern NSW, where the weevil has successfully controlled infestations. The success of the weevil in New South Wales depends on the local climate and nutrient status of Salvinia, as it doesn't like cool temperatures. The adult weevil feeds on the growing tips of the plant suppressing further growth. The larvae tunnel through the horizontal stems or rhizomes, particularly in younger sections of the plant. The overall effect of the weevil is to impede growth by damaging the plant's vascular system.

However, it takes a long time for the weevil to build up a large enough population late in the Summer season, a disadvantage if immediate control is desired. And when the plants are all consumed there is little left for the weevil to survive on, so it may need to be re-introduced if the Salvinia returns. The weevil can also interfere with other weed spraying programs as it is unknown what effect spraying has on their populations.

In the Sydney West Blue Mountains region, there have been no successful, long term releases accomplished to date. This plan proposes that the Sydney Weeds Committees further investigate the potential for introducing the weevil to more locations in the Sydney region as part of an integrated control program.

Prevention of spread- this requires the practice of good hygiene of boots, tyres, boating trailers, mowing equipment etc to prevent accidental and intentional spread to un-infested regions, in particular west of the Dividing Ranges. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment.

## **Water Hyacinth**

Physical removal - In areas with small, isolated infestations the most effective strategy is to physically remove the infestation and allow it to dry out on the banks of the waterway. Rakes or nets can be used to drag the plant across the water surface to the water's edge.

Chemical control - For large infestations, chemical control is more cost effective than mechanical control. The recommended herbicides for Water Hyacinth are Reglone® and glyphosate. They are both non-selective herbicides, Reglone® is a contact herbicide and glyphosate is translocated. The optimum time to spray the weed is when it is actively growing. However, the decaying plant matter is unsightly and can have a negative impact on the environment, particularly in slow moving water.

Mechanical control - can be undertaken by means of an aquatic weed harvester. The machine collects the weed and deposits it onto a sealed truck or the banks of the waterway, according to the situation. This method improves the aesthetic appearance of the waterway immediately and the weed mass is instantly removed, therefore not adding to the nutrient load in the water. The option is also more desirable than a reliance on chemical herbicides.

Biological control - Biological control is a long term management option for the weed and should be integrated with other forms of control. Two insects, a weevil and a moth, have been released for biological control of Water Hyacinth in New South Wales. They control the weed by burrowing into the plant and allowing water and bacteria to eventually rot the plant. Both agents have been released in the West Sydney region.

Prevention of spread- this requires the practice of good hygiene of boots, tyres, boating trailers, mowing equipment etc to prevent accidental and intentional spread to un-infested regions, in particular west of the Dividing Ranges. Areas may need to be quarantined, or wash down bays provided, to prevent spread of the weed through stock, produce or transported equipment.

## Senegal Tea Plant

### Physical removal

This is a viable control technique for small, isolated infestations

### Chemical control

Previous chemical control programs have not been effective at controlling Senegal Tea. An APVMA Permit is available for the use of glyphosate, however, this herbicide is not very effective.

### Mechanical removal

Aquatic weed harvesting is required to remove accumulated biomass.

### Prevention of spread

Promote hygiene and good neighbour actions to prevent accidental and intentional distribution of Senegal Tea to uninfested regions, in particular west of the Great Dividing Range.

Control of all aquatic weeds will be undertaken in accordance with the *NSW Noxious Weeds Act 1993*, *Noxious Weed Act 1993*, *Protection of the Environment Operations Act (1997)*, and the *Pesticides Act (1999)*.

## SUMMARY OF CHEMICALS available at 2005

	Alligator Weed	Salvinia	Water Hyacinth	Senegal Tea
METSULFURON-METHYL	Yes			
CALCIUM DODECYLBENZENE SULFONATE		Yes		
DIQUAT	Yes	Yes	Yes	
GLYPHOSATE ISOPROPYLAMINE SALT	Yes		Yes	
PER6339				Yes
PER7343				Yes

**Note: Users of chemicals should consult websites, product label, DPI handbook, and consult with other Council staff.** Users of agricultural (or veterinary) chemical products must always read the label and any Permit before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or not made in this publication. More information found at <http://www.apvma.gov.au>

## 4.0 LEGISLATIVE and REGULATORY SITUATION

No declaration changes are required as part of this Plan.

**Alligator Weed** is a Weed of National Significance (WONS)

Declared as a Class 3 noxious in Auburn, Holroyd, Hawkesbury River County, Ku-ring-gai, Lane Cove, Hunters Hill, Hornsby, North Sydney, Mosman, Parramatta, Pittwater, Ryde, Willoughby and Warringah Council areas. Ie. "The plant must be fully and continuously suppressed and destroyed"  
Declared as a Class 2 noxious weed in Blue Mountains Council area Ie. "The plant must be eradicated from the land and the land must be kept free of the plant"

**Salvinia** is a Weed of National Significance (WONS)

Declared as a Class 3 noxious weed in the Hawkesbury River County Council area Ie. "The plant must be fully and continuously suppressed and destroyed"

In all other Council areas throughout the Sydney West BM and Sydney North region, Salvinia is declared as Class 2.

### **Water Hyacinth**

Declared as a Class 3 noxious weed in the Hawkesbury River County Council area. Ie. “The plant must be fully and continuously suppressed and destroyed”

In all other Council areas throughout the Sydney West BM and Sydney North region, Water Hyacinth is declared as Class 2.

**Senegal Tea Plant** is a Weed of National Significance (WONS)

Declared as a Class 1 noxious weed throughout the whole of NSW. Ie “The plant must be eradicated from the land and the land must be kept free of the plant”.

## **5.0 CONSIDERATIONS and OPPORTUNITIES**

### **5.1 Financial support to implement the Plan**

Opportunities to be exploited and therefore assist in the implementation of this plan include:

- Continue to seek noxious weed funding for on ground control from the Department of Primary Industries
- Seek funding from state and federal government programs via state agencies, the Catchment Management Authorities (eg. NHT) and relevant funding for WONS (e.g. “Defeating the Weeds Menace”).
- Control the Salvinia, Alligator Weed and Water Hyacinth in one hit where they are located together and where treatment method is the same.
- Utilise the same contractor for on ground control and treat both sides of a water body at the same time, including where it is managed by two separate LCA’s (eg. the Duck River, which is part of the boundary between Parramatta and Auburn Councils).

### **5.2 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, Salvinia and Senegal Tea Plant are three 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.

This plan 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;
- 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**, 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 Sydney Harbour Catchment Blueprint**, in particular:  
**Management Action 33:**

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

### **5.3 Barriers and Contingencies**

The effective management of aquatic weeds can be achieved by implementing the Action Plans detailed in Section 6.0 and overcoming the barriers listed below:

Contingencies – future events that may to occur and delay implementation of the Plan:

- Ongoing drought conditions, providing optimum conditions for some species to grow prolifically in waterways
- Ease of spread of the weed, continual reinfestation and demand for follow up control work
- Discovery of new and large infestations across the region – public and private land
- Funding for weed control is spread thinly

Barriers – what can get in the way of effective control:

- Inconsistency of effective weed management between land managers (Objective 4)
- Ease of spread of the weed and reinfestation (Objectives 1,2,3,4,5,6)
- Continual sale in nurseries and aquarium shops (Objective 6)
- High cost of mechanical removal (Objective 1,2,3 – chemical control)
- No access to a full-time aquatic weeds harvester in the region (Objective 1)
- Physical removal is labour intensive (Objective 1,2,3 – chemical control)
- Funding for follow up weed control is limited, but vital in preventing re-invasion (Objectives 1,2,3)
- Public perception of herbicide and chemical use in waterways. (Objective 5)
- Lack of success with bio control agents. (Objectives 1,2,3 – trials)
- Limited ability to do large scale control in habitat sensitive areas. (Objectives 1,2,3)
- Disinterest of private landholders, hobby farmers and absent rural landholders (Objectives 5,6)
- Some infested areas are difficult to access (Objectives 1,2,3)

6a. Draft ACTION PLAN for **ALLIGATOR WEED**

OBJECTIVE	ACTION	PERFORMANCE INDICATORS	By WHOM
<p>1. To reduce core infestations on public land using biological control, chemical, mechanical and manual removal, as required</p>	<ul style="list-style-type: none"> <li>• Inspect high risk areas and record outcomes of inspection</li> <li>• Supplement biological control with chemical control during “lag phase” on aquatic infestations</li> <li>• Carry out chemical and biological control as dictated by best practice at the time</li> <li>• Ongoing research and trials</li> <li>• Implement and evaluate sustainable control techniques.</li> <li>• Monitor existing and potential sites on a regular basis</li> <li>• Liaise and co-ordinate with neighbouring LCA’s.</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial &amp; ground inspections of core areas up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• Biological control releases in September and January.</li> <li>• Chemical control, 3 times per season (Nov-Feb)</li> <li>• Information on trials and sustainable techniques is shared and distributed within 6 months of results.</li> <li>• Core infestations are contained in the first 4 years of this plan.</li> </ul>	<p>LCA’s DPI</p>
<p>2. To reduce the incidence and control marginal infestations on public land within 4 years</p>	<ul style="list-style-type: none"> <li>• Inspect high risk areas and record status and outcomes of inspection</li> <li>• Determine high risk areas</li> <li>• Inspect and record new infestations immediately</li> <li>• Commence control program on new infestations (most suitable control method to be determined by size and location of infestation)</li> <li>• Alert neighbouring LCA’s about new infestations immediately after detection.</li> <li>• Supplement biological control with chemical control during “lag phase” on aquatic infestations</li> <li>• Carry out chemical and biological control as dictated by best practice at the time</li> <li>• Manually remove isolated plants and small infestations and dispose of in a legally permissible manner</li> <li>• Ongoing research and trials</li> <li>• Implement and evaluate sustainable control techniques.</li> <li>• Monitor existing and potential sites on a regular basis</li> <li>• Liaise and co-ordinate with neighbouring LCA’s.</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial &amp; ground inspections of marginal areas up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• Biological control releases in Sept and January.</li> <li>• Chemical control, 3 times per season (Nov-Feb)</li> <li>• Appropriate control method commenced within 5 working days of newly detected infestations.</li> <li>• A measurable % reduction in marginal infestations each year, in first 3 years of the Plan (% amount will depend on the amount of infestation and available resources in each LCA)</li> <li>• Target a number of marginal infestations for eradication within the life of the Plan.</li> <li>• Information on trials and sustainable techniques is shared and distributed within 6 months of results</li> <li>• Monitor sites during start &amp; end of growing season</li> <li>• Info sharing at quarterly Weeds Committee meetings</li> <li>• Hold an annual info sharing forum.</li> </ul>	<p>LCA’s DPI</p>
<p>3. To implement a control program on new infestations on public land within 5 working days of detection</p>	<ul style="list-style-type: none"> <li>• Map new infestations immediately</li> <li>• Commence control program (most suitable control method to be determined by size and location of infestation)</li> <li>• Monitor new infestations</li> </ul>	<ul style="list-style-type: none"> <li>• Mapping information updated within 1 month of detection</li> <li>• Appropriate control method commenced within 5 working days.</li> </ul>	<p>LCA’s</p>

	<ul style="list-style-type: none"> <li>Alert neighbouring LCA's about new infestations</li> </ul>	<ul style="list-style-type: none"> <li>Monitor sites during start &amp; end of growing season</li> <li>Neighbouring LCA's are notified within 1 month.</li> <li>Reports and info sharing at quarterly Weeds Committee meetings</li> </ul>	
4.To increase the identification and control skills of agency staff and contractors	<ul style="list-style-type: none"> <li>Teach identification skills to agency staff as part of in house training</li> <li>Provide updates on latest control protocols</li> <li>Annual opportunity to share information about BMP and control techniques</li> </ul>	<ul style="list-style-type: none"> <li>Annual staff training workshops/field days</li> <li>Updated and latest control protocols are publicised via Weeds Committees and contractor networks (eg. AABR) once a year.</li> <li>Hold an annual info sharing forum for aquatic weeds.</li> </ul>	LCA's DPI Agency staff, contractors
5.To increase the identification of Bushcare/Landcare volunteers and private landholders, and how to report aquatic weed infestations	<ul style="list-style-type: none"> <li>Update landholders near infestations on current control sites and programs</li> <li>Train landholders to inspect their land /dams on a regular basis, how to prevent spread and how to inform LCA's of any suspected outbreaks</li> <li>Aquatic weeds community sightings database</li> </ul>	<ul style="list-style-type: none"> <li>Community and Bushcare news articles published every 6 months</li> <li>Conduct training workshops annually in the region, to teach identification skills</li> <li>Educational material distributed at 3 field days/training days conducted across the region annually. Utilise Weedbuster Week to promote awareness and distribute information.</li> <li>Community sightings database set up within first year of the plan.</li> </ul>	LCA's  Bushcare/Landcare volunteers  Private landholder
6.To enforce <i>Noxious Weed Act</i> so that landholders control infestations on their land, and the sale of these aquatic weeds is prevented.	<ul style="list-style-type: none"> <li>Target private properties inspections near known infestations</li> <li>Re-inspected private properties after information/notices are issued</li> <li>Inspect aquarium shops, pet shops and nurseries in each LCA area</li> </ul>	<ul style="list-style-type: none"> <li>Private property inspections/reinspections carried out and recorded twice a year</li> <li>All aquarium shops, pet shops and nurseries in each LCA area are inspected at least once a year.</li> </ul>	LCA's

6b. Draft ACTION PLAN for **SALVINIA**

OBJECTIVE	ACTION	PERFORMANCE INDICATORS	By WHOM
<p>1.To reduce core infestations on public land using biological control, chemical, mechanical and manual removal, as required</p>	<ul style="list-style-type: none"> <li>• Inspect high risk areas and record outcomes of inspection</li> <li>• Supplement biological control with chemical control during “lag phase” on aquatic infestations</li> <li>• Carry out chemical and biological control as dictated by best practice at the time</li> <li>• Ongoing research and trials</li> <li>• Implement and evaluate sustainable control techniques.</li> <li>• Monitor existing and potential sites on a regular basis</li> <li>• Liaise and co-ordinate with neighbouring LCA’s.</li> <li>• Lobby and seek funding for access to a harvester for the HN River.</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial &amp; ground inspections of core areas up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• Biological control releases in September and January.</li> <li>• Chemical control, 3 times per season (Nov-Feb)</li> <li>• Information on trials and sustainable techniques is shared and distributed within 6 months of results.</li> <li>• Core infestations are contained in the first 4 years of this plan.</li> <li>• Secured annual access to a harvester for the HN River as long as harvesting required.</li> </ul>	<p>LCA’s DPI</p>
<p>2.To reduce the incidence and control marginal infestations on public land within 4 years</p>	<ul style="list-style-type: none"> <li>• Inspect high risk areas and record outcomes of inspection</li> <li>• Supplement biological control with chemical control during “lag phase” on aquatic infestations</li> <li>• Carry out chemical and biological control as dictated by best practice at the time</li> <li>• Manually remove isolated plants and small infestations and dispose of in a legally permissible manner</li> <li>• Commence control program on new infestations (most suitable control method to be determined by size and location of infestation)</li> <li>• Ongoing research and trials</li> <li>• Implement and evaluate sustainable control techniques.</li> <li>• Monitor existing and potential sites on a regular basis</li> <li>• Alert neighbouring LCA’s about new infestations.</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial &amp; ground inspections of marginal/isolated areas up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• Biological control releases in September and January.</li> <li>• Chemical control, 3 times per season (Nov-Feb)</li> <li>• A measurable % reduction in marginal infestations each year, in first 3 years of the Plan (% amount will depend on the amount of infestation and available resources in each LCA)</li> <li>• Target a number of marginal infestations for eradication within the life of the Plan.</li> <li>• Information on trials and sustainable techniques is shared and distributed within 6 months of results</li> <li>• Monitor sites during start &amp; end of growing season</li> <li>• Info sharing at quarterly Weeds Committee meetings</li> <li>• Hold an annual info sharing forum.</li> <li>• Mapping information updated within 1 month of detection</li> <li>• Appropriate control method commenced within 5 working days.</li> </ul>	<p>LCA’s DPI</p>

<p>3.To implement a control program on new infestations on public land within 5 working days of detection</p>	<ul style="list-style-type: none"> <li>• Map new infestations immediately</li> <li>• Commence control program (most suitable control method to be determined by size and location of infestation)</li> <li>• Monitor new infestations</li> <li>• Alert neighbouring LCA's about new infestations</li> </ul>	<ul style="list-style-type: none"> <li>• Mapping information updated within 1 month of detection</li> <li>• Appropriate control method commenced within 5 working days.</li> <li>• Monitor sites during start &amp; end of growing season</li> <li>• Neighbouring LCA's are notified within 1 month.</li> <li>• Reports and info sharing at quarterly Weeds Committee meetings</li> </ul>	
<p>4.To increase the identification and control skills of agency staff and contractors</p>	<ul style="list-style-type: none"> <li>• Teach identification skills to agency staff as part of in house training</li> <li>• Provide updates on latest control protocols</li> <li>• Annual opportunity to share information about BMP and control techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Annual staff training workshops/field days</li> <li>• Updated and latest control protocols are publicised via Weeds Committees and contractor networks (eg. AABR) once a year.</li> <li>• Hold an annual info sharing forum for aquatic weeds.</li> </ul>	<p>LCA's DPI Agency staff, contractors</p>
<p>5.To increase the identification of Bushcare/Landcare volunteers and private landholders, and how to report aquatic weed infestations</p>	<ul style="list-style-type: none"> <li>• Update landholders near infestations on current control sites and programs</li> <li>• Train landholders to inspect their land /dams on a regular basis, how to prevent spread and how to inform LCA's of any suspected outbreaks</li> <li>• Aquatic weeds community sightings database</li> </ul>	<ul style="list-style-type: none"> <li>• Community and Bushcare news articles published every 6 months</li> <li>• Conduct training workshops annually in the region, to teach identification skills</li> <li>• Educational material distributed at 3 field days/training days conducted across the region annually. Utilise Weedbuster Week to promote awareness and distribute information.</li> <li>• Community sightings database set up within first year of the plan.</li> </ul>	<p>LCA's  Bushcare/L andcare volunteers  Private landholder</p>
<p>6.To enforce <i>Noxious Weed Act</i> so that landholders control infestations on their land, and the sale of these aquatic weeds is prevented.</p>	<ul style="list-style-type: none"> <li>• Target private properties inspections near known infestations</li> <li>• Re-inspected private properties after information/notices are issues</li> <li>• Inspect aquarium shops, pet shops and nurseries in each LCA area</li> </ul>	<ul style="list-style-type: none"> <li>• Private property inspections/reinspections carried out and recorded twice a year</li> <li>• All aquarium shops, pet shops and nurseries in each LCA area are inspected at least once a year.</li> </ul>	<p>LCA's</p>

## 6c. Draft ACTION PLAN for WATER HYACINTH

OBJECTIVE	ACTION	PERFORMANCE INDICATORS	By WHOM
1. 1. To reduce core infestations on public land using biological control, chemical, mechanical and manual removal, as required	<ul style="list-style-type: none"> <li>• Map known core infestations to determine high risk areas</li> <li>• Inspect high risk areas and record status and outcomes of inspection</li> <li>• Supplement biological control with chemical control during “lag phase” on aquatic infestations</li> <li>• Investigate biological control options</li> <li>• Ongoing research and trials</li> <li>• Implement and evaluate sustainable control techniques.</li> <li>• Monitor existing and potential sites on a regular basis</li> <li>• Liaise and co-ordinate with neighbouring LCA’s.</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial &amp; ground inspections of core areas up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• Chemical control, 3 times per season (Nov-Feb)</li> <li>• Information on trials and sustainable techniques and bio control is shared and distributed within 6 months of results.</li> <li>• Core infestations are contained in the first 4 years of this plan.</li> </ul>	LCA’s DPI
2. To reduce the incidence and control marginal infestations on public land within 4 years	<ul style="list-style-type: none"> <li>• Map known marginal infestations to determine high risk areas</li> <li>• Inspect high risk areas and record status and outcomes of inspection</li> <li>• Carry out chemical control as dictated by best practice at the time</li> <li>• Manually remove isolated plants and small infestations and dispose of in a legally permissible manner</li> <li>• Ongoing research and trials</li> <li>• Implement and evaluate sustainable control techniques.</li> <li>• Monitor existing and potential sites on a regular basis</li> <li>• Liaise and co-ordinate with neighbouring LCA’s.</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial &amp; ground inspections of marginal/isolated areas up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• Chemical control, 3 times per season (Nov-Feb)</li> <li>• A measurable % reduction in marginal infestations each year, in first 3 years of the Plan (% amount will depend on the amount of infestation and available resources in each LCA)</li> <li>• Target a number of marginal infestations for eradication within the life of the Plan.</li> <li>• Information on trials and sustainable techniques is shared and distributed within 6 months of results</li> <li>• Monitor sites during start &amp; end of growing season</li> <li>• Info sharing at quarterly Weeds Committee meetings</li> <li>• Hold an annual info sharing forum.</li> </ul>	LCA’s DPI
3. To implement a control program on new infestations on public land within 5 working days of detection	<ul style="list-style-type: none"> <li>• Map new infestations immediately</li> <li>• Commence control program (most suitable control method to be determined by size and location of infestation)</li> <li>• Monitor new infestations</li> <li>• Alert neighbouring LCA’s about new infestations</li> </ul>	<ul style="list-style-type: none"> <li>• Mapping information updated within 1 month of detection</li> <li>• Appropriate control method commenced within 5 working days.</li> <li>• Monitor sites during start &amp; end of growing season</li> </ul>	LCA’s

		<ul style="list-style-type: none"> <li>• Neighbouring LCA's are notified within 1 month.</li> <li>• Reports and info sharing at quarterly Weeds Committee meetings</li> </ul>	
4. To increase the identification and control skills of agency staff and contractors	<ul style="list-style-type: none"> <li>• Teach identification skills to agency staff as part of in house training</li> <li>• Provide updates on latest control protocols</li> <li>• Annual opportunity to share information about BMP and control techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Annual staff training workshops/field days</li> <li>• Updated and latest control protocols are publicised via Weeds Committees and contractor networks (eg. AABR) once a year.</li> <li>• Hold an annual info sharing forum for aquatic weeds.</li> </ul>	LCA's DPI Agency staff, contractors
5. To increase the identification of Bushcare/Landcare volunteers and private landholders, and how to report aquatic weed infestations	<ul style="list-style-type: none"> <li>• Update landholders near infestations on current control sites and programs</li> <li>• Train landholders to inspect their land /dams on a regular basis, how to prevent spread and how to inform LCA's of any suspected outbreaks</li> <li>• Aquatic weeds community sightings database</li> </ul>	<ul style="list-style-type: none"> <li>• Community and Bushcare news articles published every 6 months</li> <li>• Conduct training workshops annually in the region, to teach identification skills</li> <li>• Educational material distributed at 3 field days/training days conducted across the region annually. Utilise Weedbuster Week to promote awareness and distribute information.</li> <li>• Community sightings database set up within first year of the plan.</li> </ul>	LCA's  Bushcare/ Landcare volunteers  Private landholder
6. To enforce <i>Noxious Weed Act</i> so that landholders control infestations on their land, and the sale of these aquatic weeds is prevented.	<ul style="list-style-type: none"> <li>• Target private properties inspections near known infestations</li> <li>• Re-inspected private properties after information/notices are issues</li> <li>• Inspect aquarium shops, pet shops and nurseries in each LCA area</li> </ul>	<ul style="list-style-type: none"> <li>• Private property inspections/reinspections carried out and recorded twice a year</li> <li>• All aquarium shops, pet shops and nurseries in each LCA area are inspected once a year.</li> </ul>	LCA's

## 6d. Draft ACTION PLAN for SENEGAL TEA PLANT

OBJECTIVE	ACTION	PERFORMANCE INDICATORS	By WHOM
<p>1. To reduce core infestations on public land using chemical, mechanical and manual removal, as required</p>	<ul style="list-style-type: none"> <li>• Map known core infestations to determine high risk areas</li> <li>• Inspect high risk areas and record status and outcomes of inspection</li> <li>• Undertake trials with chemical control</li> <li>• Investigate and evaluate control techniques</li> <li>• Monitor existing and potential sites on a regular basis</li> <li>• Liaise and co-ordinate with neighbouring LCA's.</li> </ul>	<ul style="list-style-type: none"> <li>• Ground inspections up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• Information on trials and sustainable techniques is shared and distributed within 6 months of results.</li> <li>• A measurable % reduction in core infestations each year, in the life of the Plan (% amount will depend on the amount of infestation and available resources in each LCA)</li> <li>• Ongoing research and trials</li> <li>• Info sharing at quarterly Weeds Committee meetings</li> <li>• Hold an annual info sharing forum.</li> </ul>	<p>LCA's DPI</p>
<p>2. To eradicate marginal infestations on public land</p>	<ul style="list-style-type: none"> <li>• Map known marginal infestations to determine high risk areas</li> <li>• Inspect high risk areas and record status and outcomes of inspection</li> <li>• Record and report all known infestations through annual inspections and maintain up to date maps.</li> <li>• Manually remove isolated plants and small infestations and dispose of in a legally permissible manner</li> <li>• Liaise and co-ordinate with neighbouring LCA's</li> </ul>	<ul style="list-style-type: none"> <li>• Ground inspections of marginal/isolated areas up to 3 times per annum.</li> <li>• Maintain up to date maps and records - annually</li> <li>• A measurable % reduction in marginal infestations each year, in first 3 years of the Plan (% amount will depend on the amount of infestation and available resources in each LCA)</li> <li>• Target a number of marginal infestations for eradication within the life of the Plan. Information on trials and sustainable techniques is shared and distributed within 6 months of results</li> <li>• Monitor sites during start &amp; end of growing season</li> <li>• Info sharing at quarterly Weeds Committee meetings</li> <li>• Hold an annual info sharing forum.</li> </ul>	<p>LCA's DPI</p>
<p>3. To implement a control program on new infestations on public land within 5 days of notification</p>	<ul style="list-style-type: none"> <li>• Monitor new infestations on a regular basis</li> <li>• Notify DPI</li> <li>• Notify Weeds Committee and neighbouring LCAs as an alert</li> </ul>	<ul style="list-style-type: none"> <li>• Mapping information updated within 1 month of detection</li> <li>• Appropriate control method determined and commenced within 5 working days.</li> <li>• Monitor sites during start &amp; end of growing season</li> <li>• DPI is notified within 1 week of detection.</li> <li>• Neighbouring LCA's are notified within 1 month.</li> </ul>	<p>LCA's</p>

		<ul style="list-style-type: none"> <li>• Reports and info sharing at quarterly Weeds Committee meetings</li> </ul>	
4. To increase the identification and control skills of agency staff and contractors	<ul style="list-style-type: none"> <li>• Teach identification skills to agency staff as part of in house training</li> <li>• Provide updates on latest control protocols</li> <li>• Annual opportunity to share information about BMP and control techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Annual staff training workshops/field days</li> <li>• Updated and latest control protocols are publicised via Weeds Committees and contractor networks (eg. AABR) once a year.</li> <li>• Hold an annual info sharing forum for aquatic weeds.</li> </ul>	LCA's DPI Agency staff, contractors
5. To increase the identification of Bushcare/Landcare volunteers and private landholders, and how to report aquatic weed infestations	<ul style="list-style-type: none"> <li>• Update landholders near infestations on current control sites and programs</li> <li>• Train landholders to inspect their land /dams on a regular basis, how to prevent spread and how to inform LCA's of any suspected outbreaks</li> <li>• Aquatic weeds community sightings database</li> </ul>	<ul style="list-style-type: none"> <li>• Community and Bushcare news articles published every 6 months</li> <li>• Conduct training workshops annually in the region, to teach identification skills</li> <li>• Educational material distributed at 3 field days/training days conducted across the region annually. Utilise Weedbuster Week to promote awareness and distribute information.</li> <li>• Community sightings database set up within first year of the plan.</li> </ul>	LCA's  Bushcare/ Landcare volunteers  Private landholder
6. To enforce <i>Noxious Weed Act</i> so that landholders control infestations on their land, and the sale of these aquatic weeds is prevented.	<ul style="list-style-type: none"> <li>• Target private properties inspections near known infestations</li> <li>• Re-inspected private properties after information/notices are issues</li> <li>• Inspect aquarium shops, pet shops and nurseries in each LCA area</li> </ul>	<ul style="list-style-type: none"> <li>• Private property inspections/reinspections carried out and recorded twice a year</li> <li>• All aquarium shops, pet shops and nurseries in each LCA area are inspected at least once a year.</li> </ul>	LCA's

## 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, via:

- “Agency Roundtable” reports at Weeds Committee meetings
- Annual project co-ordination meetings with neighbouring LCA’s
- Site meetings between participating LCA’s as required.
- Annual reports to DPI

The plan may also be amended before 2010 to allow for any additional/new information.

All infestation sites will be monitored, and follow-up treatments undertaken where required, as part of the on-going implementation of the action plan.

## 8.0 BENEFITS

Who will benefit from this plan and control of Alligator Weed, Salvinia, Water Hyacinth and Senegal Tea Plant?

- Natural area managers - with co-ordination and information sharing among Councils, funding and staff resources can be better utilised. All participating agencies are motivated to contribute to a region wide outcome.
- Agricultural landowners with dams and waterways
- Community – the public will be more aware and responsible.
- Foreseeable recreation benefits from the control of water weeds in the region eg, ease of boating activities and safe swimming.
- Biodiversity and freshwater ecosystems values will be protected.

This plan complements and works in conjunction with the regional plans for aquatic weeds in South West Sydney. These four aquatic weeds are a high priority and are actively being controlled across the Sydney region.

## 9.0 RESOURCES

### Brochures

*AgFact* Factsheets, WEEDeck, “Stop the Spread” regional brochures

### Websites

[www.weeds.org.au](http://www.weeds.org.au)

[www.agric.nsw.gov.au/weeds](http://www.agric.nsw.gov.au/weeds)

[www.sydneyweeds.org.au](http://www.sydneyweeds.org.au)

### Books

Agriculture & Resource Management Council of Australia & New Zealand, Australian & New Zealand Environment & Conservation Council and Forestry Ministers. **Weeds of National Significance Strategic Plans.** National Weeds Strategy Executive Committee, Launceston.

Blood, Kate (2001). **Environmental Weeds: A field Guide for SE Australia.** CRC Weed Management Systems, Melbourne.

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

Parsons, W.T. & Cuthbertson, E.G. (2001). **Noxious Weeds of Australia.** Melbourne: Inkata press.

Sainty, G.R. & Jacobs, S.W.L. (1994). **Waterplants of New South Wales.** CSIRO Division of Water Resources.