NSW DEPARTMENT OF PRIMARY INDUSTRIES

REGIONAL WEED MANAGEMENT PLAN

1.1 PLAN TITLE: **Sydney-wide Regional Ludwigia Management Plan**

1.2 PLAN PROPONENTS

Regional Weeds Advisory Committee: **South West Sydney Regional Weeds Committee; Sydney Central Regional Weeds Committee; Sydney North Regional Weeds Committee; Sydney West ~Blue Mountains Regional Weeds Committee**
Contact person: **Phil Clunas - Noxious Weeds Officer**
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Signature: ..... Date: .....

1.3 NAME OF PLANT(S) **WONS** N

Botanical name(s):,	Common name(s):
Ludwigia peruviana	**Ludwigia, Peruvian Primrose**
Ludwigia longifolia	**Long Leaf Willow Primrose.**
Ludwigia repens	**Red Ludwigia**

NB: For the purposes of this plan, the term 'Ludwigia' refers to *Ludwigia peruviana* and *Ludwigia longifolia*.

1.4 PLAN PERIOD (not to exceed five years)

Starting date: **1 July 2008** Completion date: **30 June 2013**

1.5 AREA OF OPERATION: This plan extends over the geographical area represented by the four Regional Weeds Committees in the Sydney region.

1.6 AIM:

To reduce infestations and prevent the spread of Ludwigia on public and private land.

1.7 OBJECTIVES:

1. Determine the location and extent of new and existing Ludwigia infestations.
2. Strategically eradicate new Ludwigia infestations on public land within 2 years of detection
3. Contain and reduce existing Ludwigia infestations on public land within 5 years.
4. Ensure Ludwigia infestations on private land are controlled.
5. Increase the awareness, identification and control skills among Council/state agency staff and contractors.
6. Increase the awareness, identification and control skills among Bushcare/ Landcare volunteers and private landholders.
7. Obtain more information on the distribution, potential impact and control of *Ludwigia repens*.

2.0 STAKEHOLDERS

Signatories and other stakeholders include:
South West Sydney: Sutherland Shire Council, Wollondilly Shire Council, Camden Council, Campbelltown City Council, Liverpool City Council, Fairfield City Council, Bankstown City Council
Sydney Central: Canterbury City Council, Randwick City Council, Hurstville City Council, Botany Bay Council, Rockdale City Council
Sydney North: Warringah Council, Pittwater Council, Manly Council, Hornsby Council, Ku-ring-gai Council
Sydney West~Blue Mountains: Parramatta Council, Baulkham Hills Shire Council, and Hawkesbury River County Council
Participating State Agencies: Dept of Primary Industries (DPI), Department of Environment and Climate Change – NPWS (DECC), Centennial Parklands, Sydney Water Corporation, Department of Lands, Roads and Traffic Authority
Community: La Perouse Aboriginal Land Council, Cowan Catchment Weeds Committee, Ingleside Landcare Group, Dundundra Falls Bushcare group, and other private landholders and Bushcare and Landcare volunteers
All councils and stage agencies are critical to the success of this plan.

3.0 BACKGROUND and GENERAL FACTS

3.1 Weed Biology/Ecology

L. peruviana was introduced to Australia from Central and South America and cultivated at the Royal Botanic Gardens, Sydney, in 1907. It was first recorded as naturalised in Australia in the Botany Wetlands in 1970 and recognised as a potential weed in 1971. *Ludwigia peruviana* is a perennial wetland shrub which grows to approximately 4m in height. Leaves are 4-12cm long, broad, hairy, alternate and dark green or brownish green. The showy yellow flowers have 4 petals (rarely 5), only last one day, and are produced in succession at the end of the stems. In Sydney, flowering lasts from mid-summer to early-autumn. Four-angled fruit are produced, 1-2.5cm long, 0.6-1cm wide containing small seeds like finely ground pepper, with approximately 1000 – 3000 per capsule.

Ludwigia longifolia was first recorded in Australia near Sydney - National Herbarium of New South Wales Report 1993-94. An introduced aquatic plant from South America, it is an erect annual shrub up to 2.5 m tall. It has narrowly winged stems that usually branch near their ends, upper stems 4-angled. The alternate leaves are ovate to lanceolate, 5 to 35cm long and 0.5-2.5cm wide, covering upright, reddish stems. The flowers are pale yellow to cream, with notched petals about 2cm long. The fruit is similar to *L. peruviana* with tiny seeds approximately 1mm in size. Shallow fibrous roots.

Ludwigia repens, a native to California, is a new incursion in the Sydney North region. It was found and identified in the Lane Cove River in 2005 (originally mis-identified as *L. palustris)*. This is the only recorded occurrence of *L. repens* in NSW. It is an emergent aquatic herb with opposite green leaves that are red/purplish underneath broadly lanceolate-elliptic to suborbicular mostly 1–4.5 cm long, 4–27 mm wide, base tapering into a petiole 5–25 mm long. Tiny yellow flowers emerge during the warmer months, axillary, paired, bracteoles narrow, 1–5 mm long. Sepals 4, triangular. Petals 4, yellow, 1–3 mm long. Stamens 4. Fruit oblong, corners rounded to barely angled, 5–7 mm long, c. 2.5 mm wide, seeds free, yellowish brown, in several rows.

There is also a native Ludwigia species in the Sydney region, *Ludwigia peploides ssp. montevidensis* – a herb with creeping or floating vegetative stems and erect flowering stems to 50cm tall which is fairly common in ponds and streams on the Cumberland Plain.

3.2 Method of Spread

Ludwigia propagates by seed as well as vegetatively. The tiny seeds which are produced prolifically, readily adhere to moist surfaces and feathers, and are dispersed by water, wind, birds (especially ducks), machinery, footwear, clothing and mud. Machinery used to clean out drains, four wheel drive

vehicles and boats can easily spread the minute seeds. Stem layering can occur where stems come into contact with moist soil. Dislodged branches and stem pieces can take root after dispersal by flood or machinery during removal, and develop into new plants.

3.3 Description of the Problem

Ludwigia is a vigorously opportunistic plant, clogging wetlands, slow moving watercourses and waterways, limiting their usefulness for recreational and navigational purposes as well as reducing biodiversity. Reducing the rate of flow in streams causes wide ecological damage through increased sedimentation and accumulation of additional organic material resulting in the deoxygenation of the water column. This leads to the death of aquatic fauna and a change in flora species composition. Dense stands of Ludwigia can intercept almost all incident light, dominate all other water plants and in some cases lead to the loss of native plants and animals. For example, in the Botany Wetlands, *Ludwigia peruviana* displaced all other wetland vegetation to the extent that bird populations were significantly reduced.

Ludwigia peruviana seedlings flower approximately two years after germination. Seed viability is high (up to 99% in the first year) declining significantly within 2 years. The small seeds germinate readily in spring, especially in drying mud at the edges of swamps and streams. According to a report on the Botany Wetlands (Jacobs, S. et. al., 1994), seed production in 1990-1991 was approximately 450 000 seeds m^2. In addition there were approximately 65 000 seeds m^2 in the soil seed bank and approximately 300 000 seeds m^2 in old fruits that remained on the stems over winter. An estimated 20% of seed may remain dormant for over 10 years, allowing dispersal through time.

According to Csurches and Edwards (1998), *L. longifolia* has the potential to spread along the eastern and northern coasts of Australia. Ecosystems most at risk include wetlands and riparian communities. *L. longifolia* plants can form dominant colonies that result in reduced biodiversity and habitat, threatening native species. It is not known how long *Ludwigia longifolia* seeds remain viable. In extreme growing conditions *L. longifolia* has been recorded as growing from a small seedling to a flowering plant in 2 months.

Ludwigia peruviana and *L. longifolia* were identified in the TOP 20 priority weeds in the Sydney Metropolitan CMA region in 2007, due to their invasive nature, current limited distribution and potential for spread.

Ludwigia repens is widely distributed and sold as an aquarium plant in Australia. It has been assessed as a high risk species requiring further information and evaluation, as part of a NSW DPI and National Aquatic Weeds Management group project which undertook the weed risk assessment of over 400 aquarium plants. It is a weed in other countries including the US. Very little is known about its current extent, potential impact and effective control.

3.4 Reason for the Plan

This plan has been developed to coordinate the regional, strategic management of Ludwigia in the Sydney region where it is listed as a high priority weed. Although its potential for spread is considerable, due to its current limited extent successful control and eradication is achieveable if adequate funds are available, as demonstrated in the Botany Wetlands and Warriewood Wetlands.

The initial five year Sydney-wide Ludwigia regional plan expired in June 2008. Implementation of that plan resulted in a significant reduction in levels of infestation in many areas. *Ludwigia peruviana* has now been eradicated from the Kogarah, Ku-ring-gai, Woollahra and Willoughby LCAs, and significantly reduced in the Canterbury, Hurstville and Manly LCAs. However, due to Ludwigia's high seed production and viability, on-going regional control and maintenance is still required, especially in the larger infestations and where significant seed sources remain. The previous plan also produced in an increased awareness of Ludwigia and the implementation of extensive survey and mapping which resulted in the discovery of new infestations, some only recently.

In Australia, *Ludwigia peruviana* is currently found only in the Sydney region where it is now well established and has spread south to Heathcote, north to Gosford and west to Campbelltown and Liverpool. At present it does not appear to be established elsewhere in Australia.

Ludwigia longifolia is less extensive in Sydney and mostly found in the Sydney North region. It has the potential to become as extensive as *Ludwigia peruviana*. Large infestations already exist in the Port Stephens LCA in the Hunter Valley.

Ludwigia repens has been included in this revised plan as it is a new incursion to the region. It has the potential to spread much further than its current limited distribution and requires close monitoring, further investigation and potential declaration as a Class 5 noxious weed. There is currently a need to understand more about its invasiveness, potential impact, potential distribution, and the feasibility of eradication.

The null hypothesis approach could result in Ludwigia becoming a major weed not only throughout the Sydney region, but up and down the east coast and along the north coast of Australia, to the detriment of native flora and fauna in wetland and riparian environments. It has already naturalised world wide and is recognised as a major weed problem in Asia, Indonesia and North America. Ludwigia would spread to new areas throughout the Sydney region, including LCAs where it does not currently occur. For example, Ludwigia is currently not found in the upper reaches of the Nepean River in the South West Sydney region, and if no action is taken, it could become established there and further impact the Hawkesbury Nepean Catchment.

In Sydney, controlling and reducing the spread of Ludwigia will help conserve the integrity of endangered ecological communities classified under the *Threatened Species Conservation Act 1995*, such as the Sydney Freshwater Wetlands and Swamp Sclerophyll Forest on Coastal Floodplains**.**

The control of Ludwigia will also ensure the protection of rare or threatened species, for example the rare plant *Grevillea longifolia* in the Sutherland LCA, due to its presence in the same habitat niche as Ludwigia infestations. Also in the Sutherland LCA, many of the wetlands on the Kurnell Peninsula are potential habitat of the (respectively) endangered and vulnerable amphibian species - *Litorea aurea* (Green and Golden Bell Frog) and *Crinia tinnula* (Wallum Froglet).

3.5 Distribution of the infestations

Considerable distribution mapping of Ludwigia was carried out by the Sydney Weeds Committees and the SMCMA during 2006 and 2007. Please refer to the maps on the following pages (5 – 6).

The South West Sydney Regional Weeds Committee established priority areas of works via the development of a matrix (see Attachment 1) which took into account variables, such as; impact on biodiversity, class of creek, impact on recreation, agricultural productivity, dispersal via commercial activity, core or isolated site and likeliness of success in treatment.

The Sydney West~Blue Mountains Weeds Committee established priority areas of works based on variables, such as; location in catchment, core or isolated site and likeliness of success in treatment.

As all the Sydney Central and Sydney North Ludwigia infestations are relatively small and isolated, but with significant potential for spread to new areas, all sites are managed as Priority 1 areas.

Insert Map here

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4.0 LEGISLATIVE and REGULATORY SITUATION

4.1 Current Declaration

Ludwigia peruviana is a declared Class 3 noxious weed under the Noxious Weeds Act 1993 in all the LCAs covered by this plan, except for Camden and Wollondilly. Class 3 means '*The plant must be fully and continuously suppressed and destroyed*'.

Ludwigia longifolia is a declared Class 3 noxious weed under the Noxious Weeds Act 1993 in all the LCAs covered by this plan. Class 3 means '*The plant must be fully and continuously suppressed and destroyed*'. It is also declared a Class 5 noxious weed throughout NSW *"The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with"* to prohibit its sale, propagation and distribution.

Ludwigia repens is not currently declared as a noxious weed anywhere in Australia. The Sydney Metropolitan CMA and Sydney North Regional Weeds Committee have listed *L. repens* as a Weed Alert.

4.2 Declaration Changes

It is proposed that *Ludwigia peruviana* be listed as a Class 3 noxious weed in the Camden and Wollondilly LCAs so they are consistent with the other LCAs in the region, and due to the fact that small infestations of this weed have been found and eradicated in both of these areas. This is not expected to result in a change in the estimated costs to control the weed, as the minimal work that is currently required to monitor the sites is already being undertaken.

NSW DPI and the National Aquatic Weeds Management group are investigating the possibility of a national ban for *Ludwigia repens* which would include listing it as a Class 5 noxious weed in NSW to prohibit its sale, propagation and distribution in aquariums. This plan supports the declaration of *Ludwigia repens* as a Class 5 noxious weed if, after further investigation, the National Aquatic Weeds Management group recommends a national ban on the species.

5.0 CONSIDERATIONS and OPPORTUNITIES

5.1 Opportunities to be exploited

To assist in the implementation of this plan, sources of funding will continue to be sought from state and federal government departments, including the Dept of Primary Industries and various regional funding programs through the Sydney Metropolitan and Hawkesbury Nepean catchment management authorities. For example, the Sydney Metro CMA funded the control of Ludwigia on DECC land during 2005/06 and 2006/07 and the catchment-wide mapping of Ludwigia in 2007/08.

Grants for weed control on Crown land will also continue to be sought from the Dept of Lands by Sutherland and Randwick LCAs.

5.2 Species Management

The **Noxious and Environmental Weed Control Handbook** (2007) published by DPI lists the following control techniques for Ludwigia:

Ludwigia peruviana:
Non-chemical options: Small plants can be manually removed. Dense stands can be slashed and burnt. Take care not to spread the seed.

Chemical and concentration	Rate	Comments
Glyphosate 360 g/L Various trade names for aquatic use only.	10 mL in 1 L of water	Actively growing at or beyond the early bloom stage of growth but before autumn change of colour. Thorough coverage is necessary for best results.
2, 4-D amine 500g/ L Various trade names. PER 6199 PER 7381 These are limited use permits.	125 mL in 100 L of water	Apply as direct application to foliage, minimising run-off from leaf surface. **Do not apply as a broadcast spray over water.**
Picloram 45 g/kg Vigilant ®	Undiluted	Cut stump/stem injection application. Apply a 3-5mm layer of gel for stems less than 20mm. Apply 5mm layer on stems above 20mm (see label).

Ludwigia longifolia:
Non-chemical options: small plants may be manually removed, taking care not to spread seed. For further information see the *Long-leaf Willow Primrose* Weed Alert.

Chemical and concentration	Rate	Comments
Glyphosate 360 g/L Various trade names for aquatic use only. PER 7344	1.0 L per 100 L of water. Undiluted.	Spot spray application. Scrape and paint.

No information is available on the control of *Ludwigia repens*.

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

No known research has been conducted on introduced biological control agents, although there is some evidence of ecological control by shading under dense planting. Because Ludwigia seedlings require high light levels for germination, it can be appropriate in some locations to establish dense, shady cover following clearing, thereby gaining lasting control. In the long term, reducing nutrient levels entering water bodies can also lower the risk of invasion or spread.

Chemical control should ideally be undertaken from just after the hibernation period (over wintering) to the flowering period. Where water bodies and/or native vegetation are within close proximity, initial manual slashing prior to flowering or stem scraping of dense stands can be undertaken, followed by the spraying of regrowth with Glyphosate 360 g/L. This reduces the risk of over spray of herbicide onto native flora and into water bodies. Results can be improved by slashing stands prior to flowering, then spraying the regrowth 2-4 weeks later. Repeat applications may be required for larger plants, and a follow up program will be required to deal with seedlings. If resources are not available for chemical control, branches can be removed during or just after the flowering period.

<u>Prevention of spread</u>
Correct disposal of seeding material is essential. Where fruit is formed, cut and bag these before removing the rest of the plant. Unless suitably contained on site, all seed capsules should be carefully handled and bagged in single use rip-proof bags and then carefully disposed of in domestic garbage.

Care should also be taken not to inadvertently spread seed attached to clothing. In addition, discarded plant material should never be left in contact with the soil as it may take root.

5.3 Extension and Education

The main focus of continuing education and extension activities will be to increase the skills of relevent council and public authority staff, bushcare volunteers and private landholders in the identification and control of Ludwigia, and make them aware of its regional importance. This will be carried out by:

- Undertaking regional aquatic weed field days/workshops which include Ludwigia
- Training of staff and volunteers in each organisation
- Media articles in local newspapers
- Ludwigia alerts and other brochures to be sent to private landholders with potential for Ludwigia establishment
- Inspections of nurseries re. sale of *Ludwigia longifolia* seedlings.

5.4 Links to other Strategies

The area covered by this plan falls within the Southern Metropolitan Catchment Management Authority (SMCMA) and the Hawkesbury Nepean Catchment Management Authority (HNCMA) regions. Consequently, this plan assists in the implementation of the following Catchment Action Plans:

Draft Sydney Metropolitan Catchment Action Plan:

- Catchment Target B5 – Invasive Species and Threats. By 2016, the impact of terrestrial and freshwater invasive species on biodiversity is reduced by decreasing the number, distribution and impact of invasive weeds, pest animal and pathogens

- Management Target B5.1 – Weed Management. By 2011, the actions identified in the Weed Management Strategy for the Sydney Metropolitan CMA Region have been reviewed and implemented.

Hawkesbury Nepean Catchment Catchment Action Plan:

- River Health Target – RH1: By 2016, an identifiable improvement in the health of riparian lands will be achieved as determined by:
  - maintenance of the condition of all lands identified as being in good condition in the RHS (this includes most reaches within national parks)
  - an increase in the extent and connectivity of native riparian vegetation in areas identified as a priority in the RHS
  - a decrease in key weed species (e.g. canopy invading species/new outbreaks) identified as a priority.

- Biodiversity Target B4: By 2016 there is a reduction in the negative impact of invasive species on both biodiversity and sustainable primary production in terrestrial and aquatic ecosystems.

The plan also contributes to the Natural Resource Commissions (NRC) Statewide target; 'By 2015 there is a reduction in the impact of invasive species'.

This plan sits under both the Weed Management Strategy for the Sydney Metropolitan CMA Region 2007-2011 and the draft Hawkesbury Nepean Catchment Weed Management Strategy 2007-11 (not yet released).

Weed Management Strategy for the Sydney Metropolitan CMA Region 2007-2011

Goal 2: Reduce the impact of existing priority weed problems.

Objective 2.2 Implement coordinated and cost-effective solutions for priority weeds and weed problems.

Action 1. Coordinate the development and implementation of regional weed management plans and projects for priority weeds.

The following National and State weed strategies also guide the overall direction of this plan:

The Australian Weeds Strategy .
This plan assists in the implementation of Goal 1 of the Strategy: “Prevent new weed problems” and the following objectives:
1.2 Ensure early detection of, and rapid action against, new weeds.
1.3 Reduce the spread of weeds to new areas withing Australia

NSW Weeds Strategy
The plan also meets several 'Desired Outcomes' of the **NSW Weeds Strategy**:

- The development and implementation of programs to reduce environmental degradation and the loss of biodiversity through weed invasions. This can be achieved through monitoring river systems and wetlands to identify aquatic weed problems at an early stage so that they can be controlled with minimal environmental damage, and implementing control programs for weeds which cause major environmental problems;
- The implementation and monitoring of weed control programs on public and State-owned and Crown Land to ensure that objectives are achieved in an efficient and cost effective manner.
- An effective and efficient system for delivery of noxious weeds control and the enforcement of weeds legislation.
- Community participation is supported and follow-up controls are integral to the plan to provide sustainable long-term benefits.

5.5 Barriers and Contingencies

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

1. Lack of information on precise extent of Ludwigia in the region (Action 6.1);
2. Ease of spread of the weed and the need to control it before it seeds (Action 6.2);
3. Effective management requires strategic control of Ludwigia on public land (Actions 6.3 and 6.4);
4. Inability to treat Ludwigia on private land (Action 6.5);
5. Lack of awareness of Ludwigia and the potential it has to cause significant environmental degradation (Actions 6.6 and 6.7);
6. Lack of knowledge of the distribution, potential impact and control of the new incursion *Ludwigia repens* (Action 6.8)

6.0 ACTIONS and PERFORMANCE INDICATORS

ACTION PLAN FOR CONTROL	PERFORMANCE INDICATOR	WHO	ADDRESSES WHICH OBJECTIVES
6.1 Undertake surveys to locate and record new and existing Ludwigia infestations. Identify sites that are at risk of having new incursions.	- Surveys and inspections undertaken during Spring each year - All known infestations mapped on local and regional GIS systems by June 2009. - New infestations are recorded immediately. - Followup mapping undertaken annually to monitor progress and success of the plan	LCA's, DECC, CMAs, Sydney Water, RTA, DOL, Centennial Parklands	1. Determine the location and extent of new and existing Ludwigia infestations.
6.2 Strategically eradicate new Ludwigia infestations	- All new infestations are treated within 6 months of detection.	LCA's, DECC, Sydney Water, RTA, DOL Centennial Parklands	2. Strategically eradicate new infestations on public land within 2 years of detection
6.3 Plan and prioritise Ludwigia works eg. Target marginal infestations before core infestations; start at top of catchment; target sites of high biodiversity values first	- All infestations prioritised for treatment by June 2009 - Project plans developed by June 2009.	LCA's, DECC, Sydney Water, RTA, DOL Centennial Parklands	3. Contain and reduce existing infestations on public land within 5 years.
6.4 Control existing Ludwigia infestations on public land according to project plans and available funding.	- No. of hectares/m^2 of existing infestations treated per annum. - Infestations contained by stopping the seeding cycle.	LCA's, DECC, Sydney Water, RTA, DOL Centennial Parklands	3. Contain and reduce existing infestations on public land within 5 years.
6.5 Inspections, notifications and enforcement of the Noxious Weeds Act 1993 undertaken to control Ludwigia infestations on private land.	- No. of inspections and notifications - No. of private landholders who have undertaken Ludwigia control. - Follow up with s.18 notices if no action taken within 3 months.	LCA's, private landholders	4. Ensure Ludwigia infestations on private land are controlled
6.6 Educate and train LCA and agency staff (including management) in Ludwigia ID and control. Information sharing among staff and main contractors about control practices and weed seed spread protocols.	- 1 training workshop per region per year - 1 staff field day - Weed Seed Spread protocols for Ludwigia are distributed to LCA/agency staff and main contractors undertaking control. - Weed Seed Spread protocols are implemented by all LCA/agency/ contractor staff. - Management are aware of responsibilities to control Ludwigia - Ludwigia included in regional weed brochures, WEEDeck and the	LCA's, DECC, Sydney Water, RTA, DOL Centennial Parklands	5. Increase the awareness, identification and control skills among Council/state agency staff and contractors

	committees' website.		
6.7 Provide information, education and training for volunteers and landholders.	- Ludwigia alerts are sent to all high risk properties each year (ie properties with waterways, wet areas, ideal growing habitat) - Educational material attached to enforcement notices - Information distributed at 3 information stalls in the region each year. - 1-2 training workshops per region per year	LCA's, DECC, volunteers, private landholders	6. Increase the awareness, identification and control skills among Bushcare/ Landcare volunteers and private landholders
6.8 Undertake and encourage further investigation of the invasiveness, distribution, potential impact, and the feasibility of eradication of *Ludwigia repens*.	- Surveys of Lane Cove River undertaken annually - Distribution of *L. repens* on Lane Cove River mapped by June 2009 - Information on *L. repens* sought from all sources and disseminated. - Participate in research trials to develop best management practice - Support provided to DPI and National Aquatic Weeds Management Group during investigations and research of *L. repens* and for any subsequent recommendation for a national ban and declaration of Class 5 in NSW. - Weed Alert information on *L. repens* distributed to committee members.	LCA's, DECC, DPI, Royal Botanic Gardens, National Aquatic Weeds Management Group	7. Obtain more information on the distribution, potential impact and control of *Ludwigia repens*

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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, in their reports to weeds committee meetings and annual reports for funding. The plan will also be reviewed annually to allow for any additional/new information.

All treated infestations will be monitored, and follow-up control undertaken where required, as part of the on-going implementation of the action plan. This control will be subject to agency priorities and available funding. The effectiveness of the control techniques will also be monitored and modified as required.

Followup mapping will be undertaken annually to measure changes in the extent of Ludwigia infestations and thus the success of this plan.

8.0 BENEFITS

The implementation of this plan will reduce the environmental damage caused by Ludwigia infestations on both public and private land, and prevent the establishment of new infestations in areas where it is not yet found, thus resulting in significant long term cost savings. Ludwigia has the potential to occupy every wetland and creekline in the Sydney region (as well as other parts of Australia) and the signatories to this plan are committed to preventing this from happening.

Controlling Ludwigia will be of enormous benefit to the biodiversity of both native flora and fauna in wetlands and riparian areas. It will assist in the conservation of various Endangered Ecological Communities and Threatened Plants listed under the *Threatened Species Conservation Act 1995*. It will also result in less sedimentation in wetlands and waterways due to excess organic matter causing deposition. This deposition can cause eutrophication resulting in deoxygenation of the water column, death of fauna and loss of biodiversity. Controlling Ludwigia will prevent the reduction of the rate of flow in waterways, which can result in flooding and will also ensure the continual use of waterways for recreational and navigational purposes.

9.0 RESOURCES

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Ensbey, R & Johnson, A. *Noxious and Environmental Weed Control Handbook – a guide to weed control in non-crop, aquatic and bushland situations 3rd edition* (2007) NSW DPI.

Robinson, L. (1994). *Field Guide to the Native Plants of Sydney*. Kangaroo Press, Sydney

NSW Agriculture (2003). *Weed Alert - Longleaf Willow Primrose Ludwigia longifolia*

http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/144644/longleaf-willow-primrose.pdf
http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Ludwigia~repens
http://www.sydneyweeds.org.au
http://www.weeds.org.au
http://www.weeds.crc.org.au/weed_management
http://www.dpi.nsw.gov.au

ATTACHMENT 1

Matrix to determine Priority Areas of Works for Aquatics / Semi-Aquatic Weeds

Developed by the South West Sydney Weeds Committee – July 2007

Variable		score
Isolated site - mobile		4
Isolated site - contained		1
Core site		1
Class of Creek	Class 1	4
	Class 2	3
	Class 3	2
	Class 4	1
Conservation significance	Endangered species, Endangered community, Endangered population	5
	Site is very close to endangered bushland, endangerd species etc, or is part of a regional corridor.	4
	Intact local bushland	3
Impact on recreation	High	5
	Med	3
	Low	1
New infestation		4
Commercial activity - dispersal nurserys, aquariums, market gardens, car boot sales, earth works	High	5
	Med	3
	Low	1
Likliness of success	Eradication	3
	Reduction	2
	Containment	1
Agricultural productivity		5
Totals	**13 + = High Priority**	
	11-12 = Medium Priority	
	10 and less = Low Priority	