

Water Primrose *Ludwigia grandiflora*
A Management Guide for Landowners

Version 1 (2016)



Introduction

This document provides practical guidance and tools for the control and eradication of water primrose *Ludwigia grandiflora*, one of the most potentially damaging invasive species threatening our wetlands. It also provides the basis of an agreement between the Environment Agency and the landowner or person responsible for a site containing water primrose. This will help to deliver the eradication of the plant of behalf of the landowner. The national programme for the eradication of water primrose is being coordinated by the Environment Agency.

What is Water Primrose?

Water primrose *Ludwigia grandiflora* is a perennial plant associated with wetlands and the margins of watercourses, ditches, ponds and lakes. It has become a serious invader of wetlands in Western Europe, where it spreads by vegetative fragments and forms dense carpets of growth that exclude native species, increase flood risk and siltation and degrade amenity.



Water primrose is native to South and Central America and parts of the USA. It was introduced to France in 1830 and has become one of the most damaging invasive plants in that country. It has been introduced into the United Kingdom through the ornamental plant trade, but was banned from sale in England in April 2014.

In 2010 the GB Non-Native Species Secretariat (NNSS) identified a high risk that water primrose could spread across the whole UK. Water primrose then became the target of an Invasive Species Action Plan (ISAP) which describes plans for its eradication and tasks the coordination of that role to the Environment Agency (EA). The ISAP is shown in Appendix 1. Many of the ISAP actions are now complete and it will be updated shortly.

The task is urgent. It has been estimated that it will cost £73K to eradicate water primrose from GB, saving £242 million from what would be required if it spread unchecked (Defra commissioned report from CABI 2010: *The Economic Cost of*

Invasive Non-Native Species to the British Economy). Currently we know of 30 sites (29 in England, 1 in Wales), and we believe that ten of these sites have been eradicated successfully. If we succeed in eradicating water primrose, British wetlands may in the future achieve a particular European significance because we have preserved them from water primrose inundation.

Identification of *Ludwigia*

The plant has several growth forms depending on habitat and time of year, and can be hard to identify when not in flower. In the spring its stems spread out along mud or the surface of water, with small oval leaves. During summer the leaves become more spear shaped and the stems grow upwards. From July until October, distinctive bright yellow 5-petaled flowers form. In the winter the plant dies back leaving brown stems and seed pods.

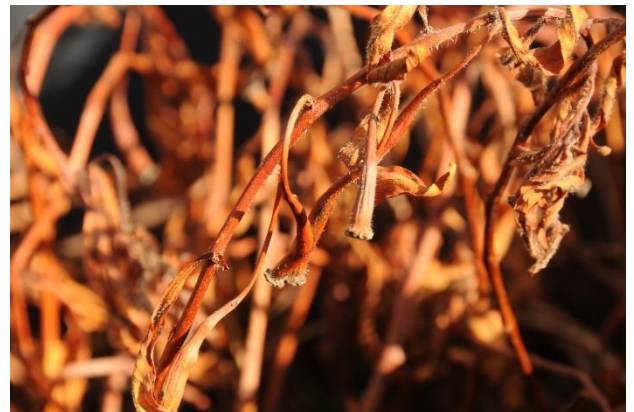
Spring



Summer/Autumn



Winter



Good identification aids are readily available including identification sheets and images by the [Non-Native Species Secretariat](http://www.nonnativespecies.org/)¹ (see Appendix 2) and a guide produced by [Qbank](http://www.q-bank.eu/)².

Environment Agency staff can also verify possible records.



Several other species may be confused with *Ludwigia grandiflora*. Brooklime *Veronica beccabunga* (right hand image, above, taken in Feb) can resemble *Ludwigia* (left hand image, above, taken in May). Brooklime has more rounded leaves, and achieves this growth form in late winter/early spring, when water primrose is still dormant. Other plants with leaves that might be confused with *Ludwigia* include Water mint *Mentha aquatica* (characteristic minty smell), amphibious bistort (*Persicaria amphibia*) and forget-me-not *Myosotes scorpioides* (see Appendix 2).

Other Invasive *Ludwigia*

Ludwigia peploides is similar to *L. grandiflora*, but has not yet been confirmed in the wild in the UK. *L. peploides* stems grow more horizontally and it has petals usually 1.0-1.5 cm long, and anthers 1.0-1.7 mm, whereas *L. grandiflora* stems grow vertically and have larger petals and anthers. Additionally, the small leaves at the base of the flower are triangular to egg-shaped in *L. peploides*.

¹ <http://www.nonnativespecies.org/index.cfm?sectionid=47>

² <http://www.q-bank.eu/Plants/BioloMICS.aspx?Table=Plants%20-%20Species&Rec=64&Fields=All>



Ludwigia x kentiana is a hybrid between the rare native Hampshire purslane *Ludwigia palustris* (below) and another non-native ornamental *Ludwigia repens*. It is essential to verify that the plant is not the rare native species before any control is performed. This requires genetic analysis, which [Trevor Renals](#) from the Environment Agency can facilitate on your behalf. If you believe your *Ludwigia* may not be *L. grandiflora*, seek advice from your EA contact.



Ludwigia palustris, Hampshire purslane. A rare native *Ludwigia*.

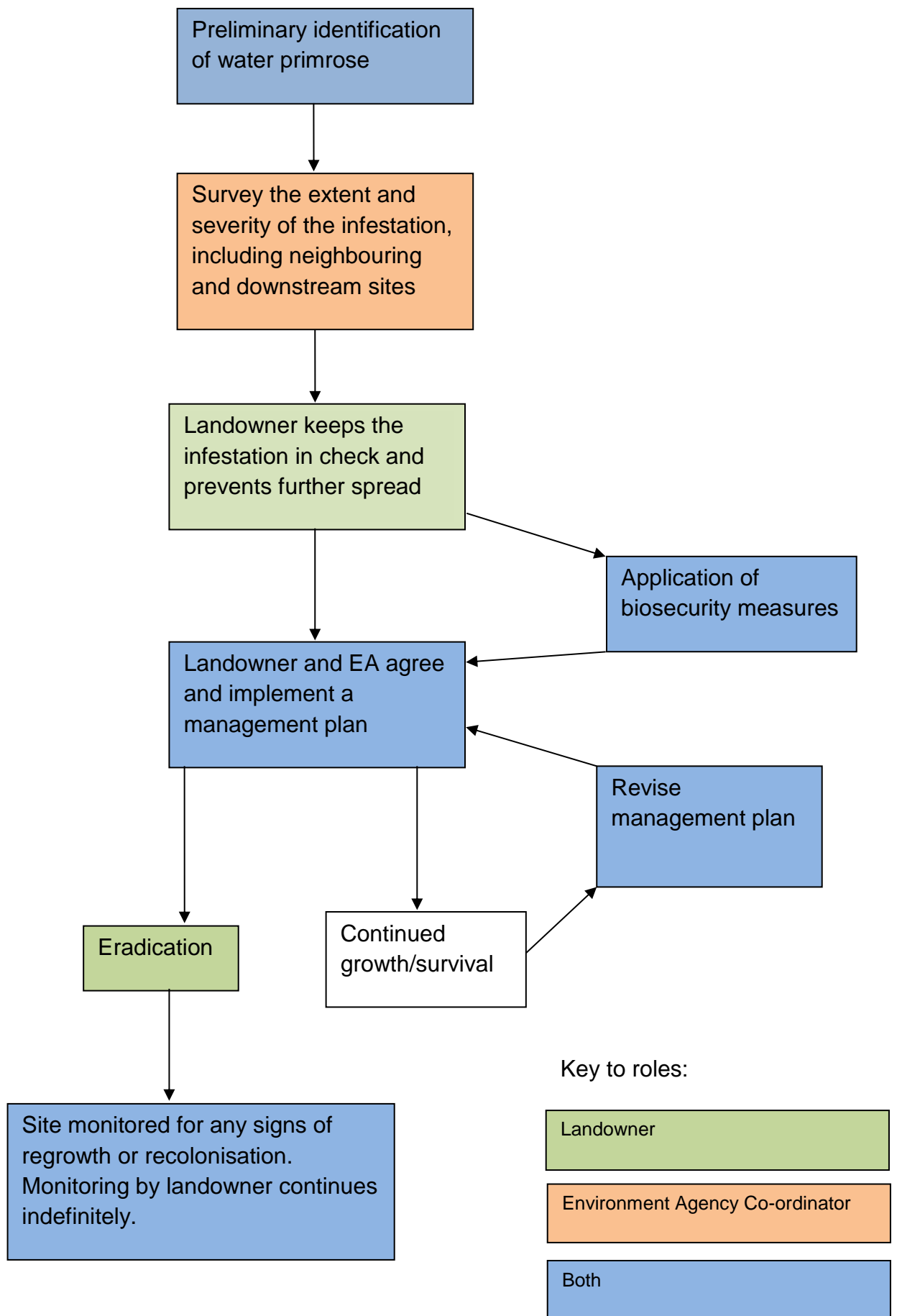
I believe I have water primrose. What do I do now?

If you believe you have water primrose, the first step should be to contact the Environment Agency who can arrange for it to be verified.

Once a new record of water primrose is verified, a programme of control should be planned and undertaken, culminating in eradication. Swift and effective action to eradicate the plant from your land is vitally important, and responsibility for this management rests with you. Most importantly, you must ensure the plant is kept contained. Allowing or causing it to spread may lead to prosecution. Your local EA contact will provide all possible help and support, and some financial help may be available.

The flow chart below shows steps that can be involved in eradication and these are explained in the following sections.

Flowchart showing steps in eradication of water primrose



Surveying the extent and severity of the infestation

As the landowner, you may have detected water primrose yourself and reported it, or been contacted by an EA officer who has verified that the plant is present. Water primrose is believed to be spread largely, and possibly solely, by vegetative propagation in GB, and you may be aware of important details of the site history. If there is no record of how the plant was introduced to the location, EA staff may survey potential routes of invasion and suitable nearby habitat and downstream water bodies to establish whether water primrose is established beyond the site of initial discovery. If the site is on-line with a watercourse, it is especially important for them to survey suitable habitats downstream. If you know where the water primrose originated from, please let the EA know. If you have given away any plant material to friends and neighbours for their ponds or lakes, please ensure they are made aware of the risk and perform a thorough inspection. If water primrose has established in their water feature, they will need to contact the Environment Agency.

My neighbour has water primrose but refuses to treat it. What should I do?

It is possible that water primrose may be present on your neighbour's property, and that they are not as willing as you to tackle the problem. The Invasive Alien Species (IAS) Regulation brings new powers to control invasive species listed under the regulation, which includes water primrose. Under Article 7 listed species may be not be kept, allowed to reproduce in or released from a contained holding. This will complement the current provisions of the Wildlife and Countryside Act (1981) under which it is illegal to allow water primrose to spread from your property.

In addition, under the Infrastructure Act 2015, Species Control Agreements (SCAs) have been introduced, with more stringent Species Control Orders (SCOs) obliging landowners to undertake control of species such as water primrose if a SCA proves ineffective. In effect this will introduce powers to encourage landowners to take action on invasive non-native species or permit others to enter the land and carry out those operations. The intention is that these powers should be used in exceptional circumstances where a voluntary approach cannot be agreed and there is a clear and significant threat from inaction. It is also intended that they will be used primarily to support national eradication programmes, as is the case with water primrose.

More detail on legislation is given in the Appendix 4 and 5

Containing the infestation and preventing further spread

Once the extent of infestation on your land is established, it is vital to prevent further spread from the site through effective biosecurity. The risk of escape may be influenced by site features. For example public access may increase the possibility of further spread or re-introduction, and water movement or fish stocking may present a risk of transferring propagules. Infestations that are in flowing water, or in sites that

discharge to a watercourse are at high risk of causing spread and must be contained or isolated.

Water primrose is normally spread through transport of plant fragments, rather than seed which is thought to be rarely viable in the UK. Viable material can be transported by flowing water (e.g. between linked ponds), by movement of plant material or unscreened water (e.g. fish transfers), attached material (e.g. contaminated mud) on footwear, boats, tyres, livestock etc., or by deliberate re-planting by people with access to the infested site.

Containment of the site with barriers or fencing to prevent unauthorised access is a valuable first step, together with signage (e.g. 'This is a Water Primrose Eradication Site, please keep out') to raise awareness and highlight biosecurity.

All potential pathways for propagules leaving the site should be identified and practical measures taken to prevent further spread. This should include application of the 'Check-Clean-Dry' biosecurity protocol:

<http://www.nonnativespecies.org/checkcleandry/>

Agreeing and implementing a management plan

Each site will be different, and, together with your EA contact it is important to agree and implement a management plan. This needs to include an agreed initial approach to management techniques, communication and monitoring.

In order to adopt the most effective plan you will need to consider factors that may influence the control strategy. These include:

- Your wishes as landowner; for example you may prefer not to use herbicide or a mechanical digger.
- Designated conservation status at the site or the presence of protected species which may influence control choices and require early engagement with other bodies such as Natural England.

Site features and other vegetation that can influence the choice of control method. For example the site may be too deep or unsafe for manual removal, dense vegetation may hinder spraying, or fluctuating water levels may make herbicide use impossible at certain times. A great deal of experience has been gained from work at the 30 sites currently under management (see map in Appendix 3), and the EA contacts for these sites are a valuable resource of experience and advice. Four case histories are outlined below to illustrate different approaches:

i. Successful eradication of a small infestation

Lake at Watton, Norfolk. A small infestation detected at an early stage in 2010 and controlled by a Local Action Group. Initial hand removal including boat access led to

apparent eradication. Small amounts re-occurred in 2011 and 2012 but following further hand removal the site is now believed to be clear.

ii. **Longer term problem with changes in control methods**

WWT London Wetland Centre. This was the first water primrose site to be managed in England. Hand pulling for several years from 1998 did not eradicate the plant, so control was changed to herbicide treatment in 2008 which worked well. However after apparently being clear for 3 years it re-appeared in 2013, prompting a change in guidance that a site needs to be clear for 5 years before declaring water primrose eradicated.

iii. **Larger established population treated with herbicide**



Farm pond, Isle of Wight. Pond 60m x 20m completely covered by water primrose. The site has been treated with herbicide (Glyphosate + Topfilm adjuvant) using a long lance sprayer from 2008 – 2014, with manual removal in 2015. The bulk of the plant was successfully eradicated in the first year or so, but subsequent years have seen the plant growing around the wetted margins of the pond. Not yet eradicated.

iv. **Complex situation with fluctuating water table and protected species present**

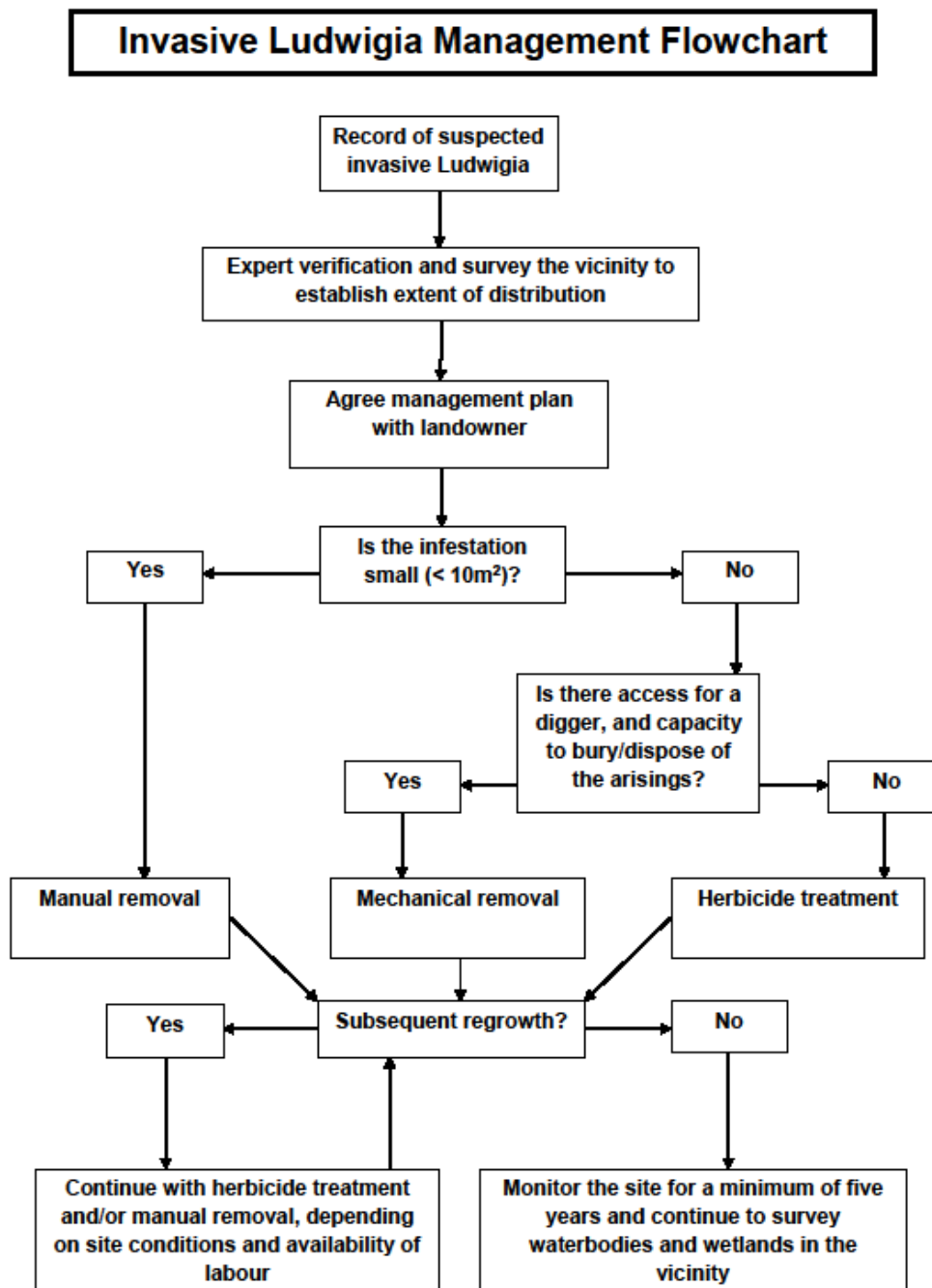


Breamore marsh SSSI, Hants. Water primrose was discovered in this SSSI in 2009. The site was subjected to 5 years of treatment including spraying several times a year and manual removal in 2010 and 2012. The site presented complex challenges including fluctuating water levels which interfered with herbicide application, introduction of grazing livestock, infestation with another invasive non-native plant and the presence of protected species including great crested newts. In November 2014 the infested silts were mechanically removed with a swing-shovel and taken off-site for burial. This required translocation of newts, planning permission and the creation of a Regulatory Position Statement (RPS 178) to permit the burial off-site. There has been

subsequent manual removal of small quantities of water primrose from surviving propagules.

Management techniques

The management flow chart below provides a framework to choose the most appropriate control method: manual removal, herbicide treatment or mechanical removal. Use of the flow chart is not prescriptive and may be influenced by site considerations, such as those described in the case histories, above, and the table, below.



| Method: | Manual removal | Herbicide treatment | Mechanical removal |
|-----------------------|---|---|--|
| Options | Small patches of <i>Ludwigia</i> can be carefully pulled up or dug using spades or forks. It can have thick, long rhizomes so digging may be more effective than hand pulling. This method also reduces the amount of damage to non-target species. After manually removing individual plants markers such as canes or GPS records can aid re-checking the exact spot the following year. | Two herbicides effective against <i>Ludwigia</i> are currently approved for use in or near water. Glyphosate (usually applied with an adjuvant such as Topfilm or codecide oil to aid adhesion to leaves) can be applied in or near water. 2,4-D amine is not approved for use in water unless an exemption is obtained from the Health & Safety Executive (HSE), but it can be applied near the water's edge. The use of an approved herbicide requires agreement from the Environment Agency via the AQHERB form approval process. A number of contractors have experience in spraying <i>Ludwigia</i> , and your EA co-ordinator can provide advice. | Mechanical removal is the favoured method of management in mainland Europe, where the use of herbicides in or near water is much more restricted. This involves using machinery (digger, dredger or bulldozer) to scrape off the top 10-20cm of infested material, followed by burial or other disposal that will not allow re-infestation. The Environment Agency has developed a Regulatory Position Statement (RPS 178) to facilitate the burial of silts infested with water primrose and other invasive alien plants without the need for a permit. |
| Advantages | Careful manual removal of small populations or plants re-growing following initial treatment can be an effective aid to eradication. Relatively cheap for small infestations. Doesn't require specialist equipment or training. Minimal non-target damage and waste generation. | Herbicides can provide effective treatment, especially where access is limited for manual or mechanical removal. Glyphosate is translocated into underground parts or material without affecting other vegetation, and if re-growth occurs in subsequent years spot spraying may be an effective aid or alternative to hand-pulling which may leave parts of roots behind. Herbicide treatment also clears surrounding vegetation, allowing <i>Ludwigia</i> regrowth to be detected more easily. | It provides rapid, effective control which is well understood. Providing sufficient material is removed there is a low risk of fragmentation, and it is easy to apply herbicide treatment or manual removal to any re-growth after digging. Mechanical removal also reduces the growing medium for any remaining <i>Ludwigia</i> propagules. |
| Dis-advantages | Not appropriate for large infestations which may require initial herbicide treatment or mechanical removal with manual removal of re-growth in subsequent years. The application of | Glyphosate is only effective on emergent or floating material (not underwater) so herbicide treatment may not be appropriate where water levels fluctuate. If possible you may need to reduce the water levels by | This approach is only feasible if there is access for a digger, a suitable site for disposal, and the capacity to bury or otherwise dispose of the arisings. This method is often the most expensive |

| | | | |
|---------------|---|--|---|
| | <p>this method is limited by potential access difficulties, such as water depth, and available manpower.</p> | <p>pumping to expose the plant to chemical control and maintain these levels for at least 48 hours to allow the herbicide to take effect. Great care must be taken to avoid spreading fragments by pumping, for example by screening outlets to allow water flow but to catch fragments.</p> <p>Herbicide treatment often gives rise to 'bonsai' water primrose (see photo below) which is hard to detect. Herbicide treatment can require 7+ years of treatment to achieve eradication.</p> | <p>option. Mechanical removal must be undertaken in a methodical fashion with great care to prevent fragmentation, dispersal and further spread. Seeking a suitable disposal option is often the most problematic and costly aspect of this method and must be undertaken before the removal commences.</p> |
| Timing | <p>Best carried out during the growing season, although efforts to dig up rhizomes of marked plants (see below) can continue in the dormant season when access may be easier.</p> | <p>Spraying in early spring is most effective. Spraying later in the season can be hindered by other vegetation.</p> | <p>Mechanical removal is possible throughout the year, but timing may be restricted by factors such as access, water levels, vegetation and presence of nesting birds or protected species.</p> |
| Advice | <p>Great care needs to be taken not to break rhizomes when digging or pulling, as these can re-grow. In Wales hand pulling has been aided by floatation vests with careful pulling to 'feel' the roots coming out.</p> <p>Manual removal is hard work, but it can raise positive awareness with the public.</p> | <p>Adding an adjuvant (Topfilm, Ecoflex or Codecide oil) to the Glyphosate formulation aids sticking to leaves. A good option is to use an approved Glyphosate formulation such as Roundup Pro-biactive at 4 litres / hectare mixed with Topfilm at 1.2 l/ha.</p> <p>If approval for its use is obtained, 2,4-D amine can be more effective than Glyphosate if used alone or if mixed with it to aid translocation: use the normal level of Glyphosate plus 10% 2-4 D amine.</p> | <p>Address any required consents and permissions at an early stage, as these can take a long time to obtain. These might include ordinary water course consent, waste exemptions, waste permits, SSSI consent, planning permission, protected species licences and possible re-location of protected species (e.g. great crested newts). Your EA contact can support you with this.</p> |



Re-growth of 'bonsai' Ludwigia after spraying

Communication and monitoring

It is rare to know the source of a water primrose infestation, and good communication with other landowners and local residents may provide information on possible sources or new infestations, reduce the risk of further spread and lessen concerns about the control activity. Your EA contact can provide leaflets and letters to distribute in the area, and signage can be erected on site to raise awareness.

The involvement of volunteers or Local Action Group members can aid communication and positive publicity, and the use of Environmental Outcome Days for control by EA staff can also raise awareness and assist with manual removal.

Effective monitoring is required to assess the effectiveness of control and to check for re-growth. A monitoring plan should be established at the outset, and it is helpful to collect regular fixed-point photographs with known reference points throughout the control programme. If the source of infestation is not known then monitoring needs to continue after eradication in case of re-introduction.


The site should be revisited several times each year, between June and October, by a person familiar with the growth forms of water primrose. Monitoring should then continue for at least 5 years: water primrose has been known to re-appear several years after presumed eradication.

Since eradication may take several years it is helpful to maintain consistency of the personnel involved if possible. If contractors are employed it can be useful to monitor their activity by joint visits to ensure as many plants as possible are tackled, and to reinforce the goal of eradicating water primrose, rather than simply keeping it in check.

Appendix


1. Invasive Species Action Plan (ISAP)

<http://www.nonnativespecies.org/index.cfm?sectionid=92>



INVASIVE SPECIES ACTION PLAN
Version: 1.1. Last updated: August 2010

Water Primrose (*Ludwigia grandiflora*)



GB Priority - HIGH

Timescale - Immediate

Aim: To eradicate *Ludwigia grandiflora** from GB and prevent its re-invasion.

Objectives:

1. Consider use of legislation to prevent sale, release and improper disposal in GB
2. Increase public awareness about this species
3. Eradicate the known populations in England and south Wales
4. Set up suitable monitoring of water bodies in Wales and England
5. Maintain surveillance in Scotland and rapidly respond if found
6. Minimise the risk of re-establishment from releases and movement from existing locations

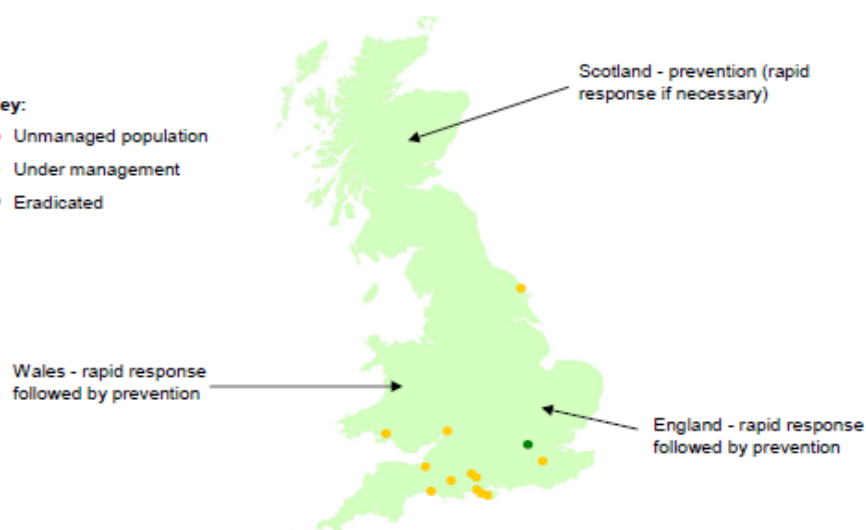
| Aim | Action | Where | Co-ordinating body | Support | Start date |
|---|--|-----------------|--------------------|----------------------------------|-----------------|
| Prevention | Commence Public Awareness Campaign for water users and gardeners | GB | NNSS | Various | Complete |
| | Discourage sale and proliferate the message that this species should not be planted or released in GB and appropriate disposal methods should be used to remove it wherever it grows | GB | NNSS | plantlife EA, OATA, HTA | Ongoing |
| | Provide advice on recognition and disposal | GB | NNSS | plantlife | Ongoing |
| Surveillance / early detection / rapid response | Monitor existing/controlled sites | E / W | EA / NNSIP | BSBI / plantlife | Ongoing |
| | Survey suitable locations | E / W | EA / NNSIP | BSBI / plantlife | Ongoing |
| | Eradicate in England and Wales | E / W | EA | plantlife | Ongoing |
| | Watching brief and contingency plan for eradication in Scotland | S | SNH / SEPA | RAFTS | Ongoing |
| Legislation | Consider adding to Schedule 9 subject to normal consultation process. | GB | Defra, WAG, SG | - | Complete |
| | Consider banning the sale of this species subject to normal consultation process. | GB | Defra, WAG, SG | - | Ongoing |
| Research | Investigate management techniques (e.g. DeCLAIM project) | GB/ Netherlands | Defra | - | Mar 2009 |

*References to *Ludwigia grandiflora* include the following:
Ludwigia pepioides synonyms: *Jussiaea californica*, *J. patibicensis*, *J. pepioides*, *J. polygonoides*, *J. repens*. sub-species: *L. pepioides*, *L. glabrescens*, *L. montevidensis*. *Ludwigia grandiflora* synonyms: *Jussiaea grandiflora*, *L. uruguayensis*, *J. uruguayensis*. *Ludwigia hexapetala*

www.nonnativespecies.org

Key:

- Unmanaged population
- Under management
- Eradicated



| Risk Register | | |
|--|-------------------|--|
| Risk | Location | Mitigation |
| Refused access to land to enable control | England and Wales | Work closely with landowners to gain compliance. Consider whether access can be obtained under nuisance legislation. |
| Continued release: a. garden ponds b. water body owners | England and Wales | PR Campaign – on planting in the wild and disposal of aquatic plants Ban on Sale |

Measurable Outcomes:

- Elimination of water primrose as a threat to the GB environment
- Increased understanding by the public of responsible plant management and disposal

Updating and review:

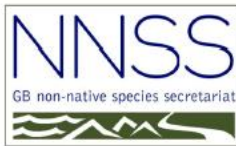
- This ISAP is subject to continual review and modification. See www.nonativespecies.org for most current version.
- This ISAP will be reviewed and re-issued, at the latest, by 1 April 2011

Supporting Documentation:

- Link to [risk assessment documents](#)
- Link to [ID sheet](#)
- Link to website fact sheet containing [TBC]:
 - Summary and technical information about the species
 - Distribution map
 - Identification guidance
 - Links to management information
 - Guidance on relevant legislation
 - Additional sources of information
- Links to other relevant websites ([Pondcheck](#), [RISC](#), [RAFTS](#))
- CEH report '[Development of eradication strategies for Ludwigia species](#)'
- Links to DeCLAIM project webpages (link to [EUPHRESCO](#))

2. Identification of *Ludwigia*

Non-native Species Secretariat Identification Sheet:



www.nonnativespecies.org

Produced by Olaf Booy, Max Wade and Vicky White of RPS

Water Primrose

Species Description

Scientific name: *Ludwigia grandiflora*

AKA: Often incorrectly identified as *L. peploides* and labelled in garden centres as *Jussiaea*; Briallen d ŵr (Welsh)

Native to: South America

Habitat: Still or slow-flowing water

Quite distinctive in floating form, more care is needed to distinguish it from other species when it is growing in the margins of water bodies. Best searched for when in flower (July to August). Spreads primarily by plant fragmentation but also by seeds. There are few native species in the UK that are similar.

Only known from a few sites in the UK and it has been eradicated from some of these. *L. x kentiana* is the only other non-native species of *Ludwigia* known to occur in the UK. Distinguishing between non-native species of *Ludwigia* is very difficult. If this is required expert consultation may be necessary.

Introduced to Europe as an ornamental and water garden plant. Causes severe negative impacts, including out-competing native species and clogging waterways.

Water Primrose is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

For details of legislation go to www.nonnativespecies.org/legislation.



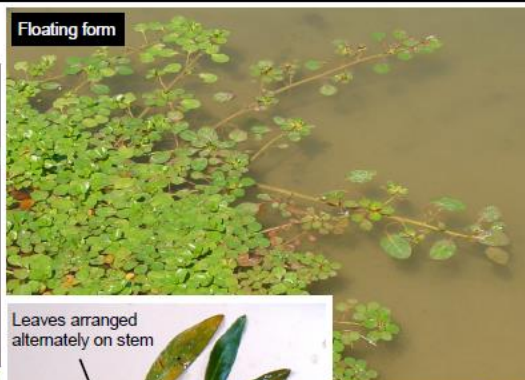
Key ID Features



Leaves can vary in shape from long and slender to round or egg shaped



Emergent form



Floating form



Leaves arranged alternately on stem

Stems can be smooth or hairy

Up to 9 cm

Stems fleshy and grow to between 20cm and 300cm long



Approx 3 cm

Bright yellow flowers with five petals



Fruit containing small seeds



Dark green with a lighter green central vein (midrib)

Identification throughout the year

Flowers from July to August. Vegetation dies back in winter leaving distinctive brown stems.



Distribution

Has been present at a limited number of sites across the British Isles although it has been eradicated from some of these.

Source: redrawn from Defra 2007



Similar Species

There are few similar species with which Water Primrose could be confused. The leaves of aquatic forget-me-nots (*Myosotis* species) have a distinctive midrib with less distinctive branching veins, unlike Water Primrose. When the floating leaves of amphibious bistort first appear they resemble Water Primrose, but are significantly larger when full grown with dissimilar flowers. Hampshire purslane (*Ludwigia palustris*) is a very rare plant of boggy areas. Although closely related to Water Primrose, it is considerably smaller.

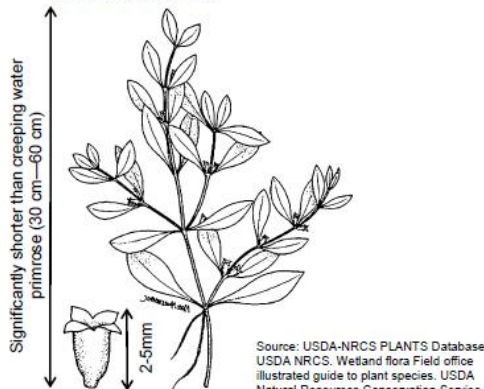
Water forget-me-not
Native
(*Myosotis scorpioides*)



Amphibious bistort
Native
(*Persicaria amphibia*)



Hampshire-purslane
Native
(*Ludwigia palustris*)



References and further reading:

Blamey, M, Fitter, R and Fitter, A (2003) *The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora*. A & C Black

Defra (2007). "Eradication strategies for invasive non-native *Ludwigia* species—PH0422". Defra

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) *New Atlas of the British and Irish Flora*. Oxford University Press

Stace, C (1999) *Field Flora of the British Isles*. Cambridge University Press

4. Legislation pertaining to water primrose.

Article 7 of the **EU Invasive Alien Species Regulation** states that:

1. Invasive alien species of Union concern shall not be intentionally:

- (a) brought into the territory of the Union, including transit under customs supervision;
- (b) kept, including in contained holding;
- (c) bred, including in contained holding;
- (d) transported to, from or within the Union, except for the transportation of species to facilities in the context of eradication;
- (e) placed on the market;
- (f) used or exchanged;
- (g) permitted to reproduce, grown or cultivated, including in contained holding; or
- (h) released into the environment.

2. Member States shall take all necessary steps to prevent the unintentional introduction or spread, including, where applicable, by gross negligence, of invasive alien species of Union concern.

Ludwigia is listed under this Regulation, which will remain in force whilst the UK remains part of the European Union.

The purpose of section 14 of the **Wildlife and Countryside Act 1981 (WCA 1981)** is to prevent the release into the wild of certain plants and animals which may cause ecological, environmental, or socio-economic harm. To achieve this, section 14 prohibits the introduction into the wild of any animal of a kind which is not ordinarily resident in, and is not a regular visitor to, Great Britain in a wild state, or any species of animal or plant listed in Schedule 9 to the Act.

Three species of water primrose are listed under Schedule 9 WCA 1981; *Ludwigia peploides*, *L. grandiflora* and *L. uruguayensis*. The hybrid, *L. x kentiana* is not listed. To date, the only species (as opposed to hybrid) recorded in the wild has been *Ludwigia grandiflora*.

With respect to plants, section 14(2) states:

'(2) Subject to the provisions of this Part, if any person plants or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9, he shall be guilty of an offence.'

In 2009, Defra published clarification (amended in 2010) on the interpretation of section 14 ([Guidance on section 14 of the Wildlife and Countryside Act 1981](#)). One of

the issues that had prevented the use of section 14 had been what constituted 'in the wild'. The guidance states that:

In principle, we would define 'the wild' as being:

"The diverse range of natural and semi-natural habitats and their associated wild native flora and fauna in the rural and urban environments in general. This can also be broadly described as the general open environment."

However, whether an introduction (release or escape) is into 'the wild' may well be dependent on the ecology of the species in question and the potentially affected environment: as such, what constitutes the wild must be judged on a case-by-case basis.

For the offence to be committed, a release or allowing to escape into the wild or planting or causing to grow in the wild must occur. Therefore, to understand the application of section 14, one must also understand the offence in its entirety. These issues are considered in detail below.

The guidance then describes what may constitute 'planting or causing to grow in the wild':

The legislation aims to prevent the planting of Schedule 9 listed plant material in the wild where it then poses a threat to our native biodiversity and ecosystems. Our views on the meaning of 'the wild' have been discussed above. We consider that planting in the wild would constitute intentionally placing viable plant material in or on suitable medium so that it can grow. This can include, for example, whole plants, seeds, rhizomes, bulbs, corms and cuttings.

Although it is impractical to attempt to describe all possible circumstances, we would not consider planting on managed land, where it is expected that the spread of the plant will be kept under control, and where the plant is not having an appreciable adverse impact on habitats and their native biodiversity, as planting in the wild. It would follow that planting in private gardens would not be considered planting in the wild and, in general, this is also likely to apply to larger scale gardens, estates and amenity planting. Conversely, where the plant is inadequately managed or contained and is likely to have an adverse effect on habitats and their native biodiversity, it is more likely that the offence will have been committed. Therefore, whether or not planting is an offence should be judged on a case-by-case basis, taking into account the potential impacts on habitats and native flora and fauna of planting the species in question, and the existence or extent of management practices employed. Again it is worth noting that the legislation provides a defence if the accused can prove that all reasonable steps have been taken, and all due diligence has been exercised, in order to avoid committing the offence.

Causing to grow in the wild

Section 14 does not impose an explicit obligation to manage Schedule 9 species not introduced onto your land by your own actions. However, the law is not entirely clear as to the full scope of the phrase "causes to grow". See for example case law on cases involving the offence in section 85(1) of the Water Resources Act 1991 (offence of 'causing' or 'knowingly permitting' polluting matter to enter controlled waters). Based on certain indications in that case law, it may be possible to argue that a landowner who knowingly allows a Schedule 9 species that he did not introduce, to accumulate

on his land and create a problem as it spreads to other areas of the wild, and who makes a conscious decision to do nothing about it, is 'causing it to grow'. However, this interpretation has not been tested, and whether the offence could apply in these circumstances would have to be established in the courts. The Department is therefore unable to offer a firm view on circumstances of that nature. The requirements of the defence in section 14(3) of the Act should be borne in mind.

We would expect that where plants listed in Schedule 9 are grown in private gardens, larger scale gardens, estates and amenity areas etc, reasonable measures will be taken to confine them to the cultivated area so as to prevent their spreading to the wider environment and beyond the landowner's control. It is our view that any failure to do so, which in turn results in the plant spreading to the wild, could be considered as 'causing to grow in the wild' and as such would constitute an offence. If the person responsible for the presence of a species in this way does not have sufficient ability or the resources to manage it so as to prevent its spreading to the wild, thereby exposing him or herself to the risk of committing an offence, he/she should seriously consider whether planting a Schedule 9 species is appropriate.

Negligent or reckless behaviour, such as inappropriate disposal of garden waste, where this results in a Schedule 9 species becoming established in the wild would constitute an offence.

In essence, in England and Wales a landowner may be breaking the law if he/she allows unmanaged *Ludwigia* to harm biodiversity or spread. Case law for section 14 is poor, and the guidance has yet to be tested. However, it does provide a very useful clarification that does enable us to describe an incentive for management to landowners. In Scotland, the [Wildlife and Natural Environment \(WANE\) Act 2011](#) creates provision for species control agreements with landowners which, if not completed, can result in species control orders enforcing the eradication of invasive non-native species.

A Species Control Order will allow a Defra agency access onto land for the purposes of managing an invasive non-native species. **The Infrastructure Act 2015**, which came into force on 12 Feb 2015, makes provision for species control agreements and orders. These powers may be exercised by the Secretary of State, the Environment Agency, Natural England and the Forestry Commission. SCOs are a last resort, if a species control agreement has been refused or breached. For the large majority of sites, we will continue to cooperate with landowners without the need for a formal agreement or order.

The new powers allow enforcing bodies to compile Species Control Agreements (SCA) with landowners to permit access to manage invasive non-native species. If the agreement is not honoured, a Species Control Order (SCO) may ensue. The Secretary of State must be informed of any agreement or order, and landowners have a right of appeal.

The powers extend to any non-native plant or animal, introduced by humans, that is likely to cause environmental or socio-economic detriment. It also includes formerly native animals, such as Eurasian Beaver. The powers are intended for species that are the target of national or local eradication programmes or a threat to sensitive areas. Control measures need to be viable and proportionate.

5. Regulatory Position Statement 178 pertaining to the disposal of Ludwigia

The treatment and disposal of invasive non-native plants

If you comply with the requirements below, we will allow you to dispose of invasive non-native plant material, and the substrate in which it is rooted,

Background

Invasive non-native plants have been introduced into the environment from a variety of sources, usually from ponds and gardens. They lack the pests and diseases that moderate their growth in their native environment. In their invaded range they have the potential to form dense monocultures that exclude native species, increase flood risk, degrade amenity and cause a variety of other social, environmental and economic impacts.

There are a number of drivers for invasive plant management. The Great Britain Invasive Non-Native Species Strategy 2015 establishes a framework for prioritising invasive species management, based on risk assessment. This requires public bodies to contribute towards controlling invasive species. Legislation, including the Wildlife & Countryside Act 1981, requires landowners to prevent the spread of invasive species, and prevent them from causing nuisance. The EU Invasive Alien Species Regulation 2015 also places additional responsibilities on Member States to prevent the transportation of invasive non-native species of EU concern, which are listed within the Regulation.

Due to increasing restrictions on the use of biocides, particularly in or near water, options for invasive plant management are becoming highly restricted. Demand for mechanical control options for invasive plants is likely to increase and we need an appropriate waste position on the fate of material arising from these operations. The disposal of waste into or on land requires an environmental permit. However, we consider that this would be disproportionate for the safe burial and treatment of invasive plants and substrate.

Our approach

We will not pursue an application for an environmental permit for the treatment and/or burial of any non-native invasive species plant material where:

You have made and maintain a document, such as a knotweed management plan, which sets out how the material will be excavated, treated or buried so that further growth and/or spread of the invasive species beyond the site is prevented. The document to be available to us on request.

Burial takes place on land that is of low habitat value in an area that is likely to be undisturbed, more than 7 metres away from an adjacent landowner's site.

The material does not contain pollutants likely to pose a threat to groundwater quality.

Once excavated the material is stored for less than 12 months prior to treatment or burial

And where in addition either 1, 2 or 3 below is followed

1. Burial of plant material, other than Japanese knotweed

Burial only takes place because other options which reduce the volume of material, and its reuse for composting and/or soil improvement, have been discounted because they are a less preferred environmental option, for example they pose an unacceptable bio-security risk.

The majority of the plant material for burial consists of invasive non-native plant species from aquatic, riparian and wetland habitats.

The total volume of material to be buried does not exceed 1000 tonnes.

2. Burial of soils containing plant propagules, other than Japanese Knotweed

Burial of soils containing seeds, rhizomes, corms, viable vegetative fragments, etc is carried out to a minimum depth of 2 metres on the site of production

3. Burial and disposal of Japanese knotweed (including propagules)

Japanese knotweed, ash from burned knotweed and/or soils containing potential Japanese knotweed is buried on the site where it arises.

Japanese knotweed material is buried, either:

with at least 5 metres of cover, or:

encapsulated in a geotextile membrane and buried with at least 2 metres of cover, where that geotextile membrane is:

- used without damage;
- large enough to minimise the need for seals;
- sealed securely;
- Can remain intact for at least 50 years;
- Can resist UV damage if exposed to sunlight.

We are notified at least one week prior to the burial.

NB Where Japanese knotweed cannot be suitably disposed of on-site it must go to an appropriately permitted landfill site or incineration facility. We should be notified of its removal from site and destination.

And in addition to all the above

You meet the relevant objectives of the Waste Framework Directive;

'... ensuring that waste management is carried out without endangering human health, without harming the environment and in particular:

- (i) without risk to water, air, soil, plants or animals;
- (ii) without causing a nuisance through noise or odours; and
- (iii) without adversely affecting the countryside or places of special interest.'

To note: Plant material may be burned at the site of production

You will need to register a paragraph D7 exemption, which also covers storage of material prior to burning.

You must take into account local by-laws and not cause a nuisance.

Ash and remaining material should be disposed of on-site (as described in parts 2 and 3, above) or taken for appropriate disposal to a permitted landfill.

Enforcement

In not pursuing an application for a permit, we will not normally take enforcement action unless the activity has caused, or is likely to cause, pollution or harm to health. For a more detailed

explanation of this enforcement position, please see our [Enforcement and Sanctions](#) statement.

This statement is based on our understanding of the relevant legislation. It applies to England only. You can get advice on the approach being taken in Wales from Natural Resources Wales.

This regulatory position will be reviewed by 2018

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