

The GB Water Primrose *Ludwigia grandiflora* eradication programme: 2018 progress report

Background



Water primrose *Ludwigia grandiflora* is an ornamental perennial plant native to South and Central America, associated with wetlands and marginal zones of watercourses, ditches, ponds and lakes. The plant has been introduced into the UK through the ornamental aquatic plant trade. It primarily spreads by vegetative fragments and forms dense carpets of growth that

exclude native biodiversity, increases flood risk and siltation and degrades amenity.

A coordinated GB eradication programme commenced in 2009. In 2010, the GB Non-Native Species Secretariat Programme Board issued a risk assessment that identified a high risk of establishment and spread across the whole UK. This was largely based on the impact it was already having elsewhere in Western Europe, particularly



France (right). For this reason, water primrose became the target of the first Invasive Species Action Plan, which described procedures for its eradication in GB and tasked the coordination of that role to the Environment Agency. Due to concern over potential escapement and spread of this species, prior to 2014, the sale of water primrose had been discouraged by a voluntary code of practice. To prevent any further introductions, in April 2014 water primrose was banned from sale in England and Wales.

2018 report focus

A summary of the location and nature of the sites was provided in the 2017 report and has not changed significantly since that publication. This report will focus on

what can be derived from the treatment records, and discuss why the efficacy of treatment appears so variable between sites.

Progress

Over the ten year period of the eradication programme, an additional twenty-three sites have been added to the fourteen originally identified in 2009. Of those thirty-seven sites, eight have been confirmed as eradicated, having been inspected and found to be free of regrowth for a period of five years. A further six sites are believed to be eradicated and are in their five-year inspection period. In addition to the fourteen sites believed eradicated, a further twenty-one sites are in active management. Most of those sites only have small areas of residual growth remaining. Of the two remaining sites, one is believed to have been eradicated in 2014 but has not been inspected during 2018, and another was included into the programme in 2018, but treatment was not undertaken until January 2019.

Figure 2, below, describes the progress to date. During 2018, there was a concerted effort to improve water primrose recording, which resulted in four new sites.

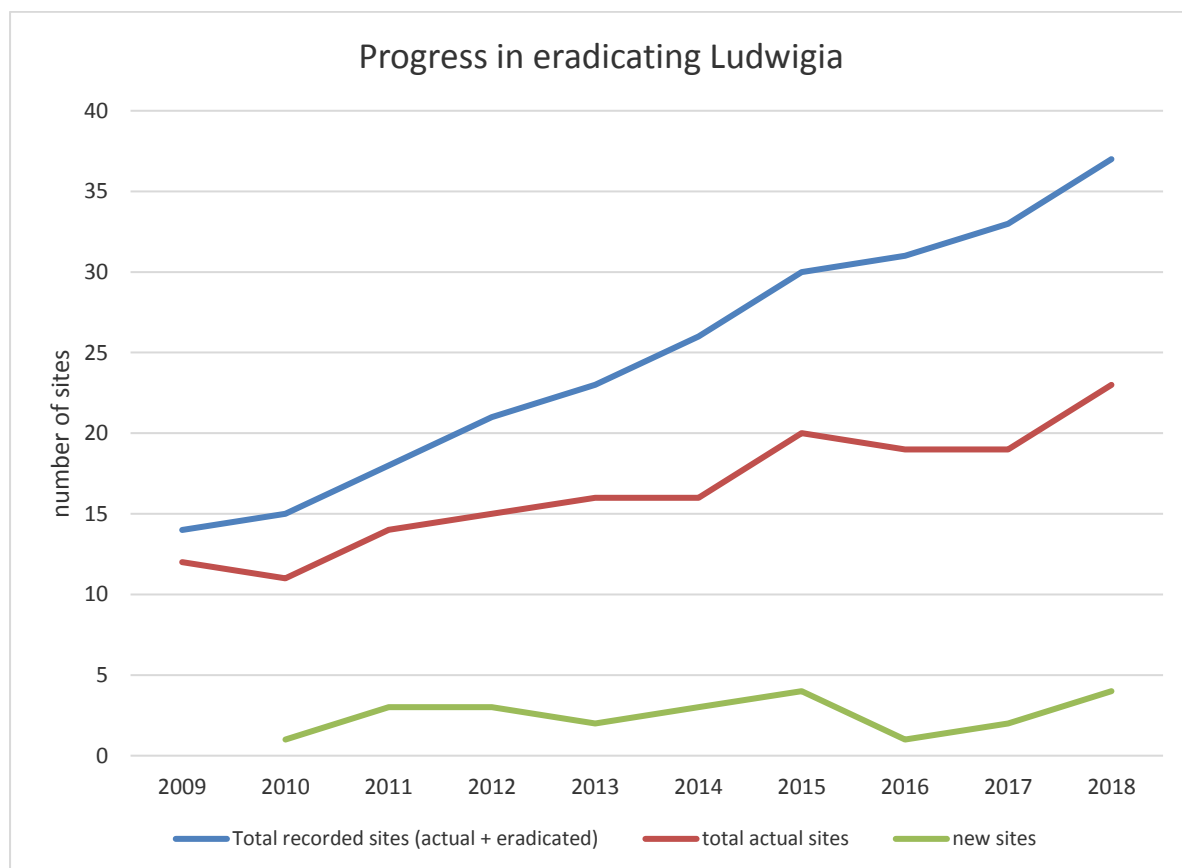


Figure 2. Progress of GB water primrose eradication programme

All known water primrose infestations have been subjected to management over the last 12 months. The revised estimate of water primrose cover for the end of 2017 was 802 m². As a result of the 2018 control programme, this total area has been reduced

to an estimated 178 m². The four new sites recorded in 2018 equate to a total area of 2621 m². All four new sites have been subjected to thorough manual and mechanical removal programmes during 2018 and early 2019, and further management is planned when regrowth appears in future growing seasons. Management at all four new sites was undertaken and resourced by the landowners.



Contractors removing 2500m² of water primrose at Stowmarket, Suffolk.

How long does it take to eradicate water primrose?

On average, it takes between three to four years to eradicate an infestation of water primrose, but many sites have been subjected to much longer periods of management without achieving eradication. Six sites have been under management for ten or more years. Reviewing the treatment records of persistent sites doesn't reveal a clear reason why eradication is taking longer than average. Table 1 reveals that a variety of mechanical, manual and chemical methods have been applied to these sites, with no apparent absence of commitment. West Bay has been subjected to mechanical excavation twice, chemical treatment twenty-five times and manual removal by an experienced contractor.



West Bay, Dorset 2010 (left) and 2017 (right). Duckweed *Lemna* spp. domination may be as a consequence of the protracted use of glyphosate at the site.

In general, the persistent sites in table 1 often tend to be deeper than the sites that have been eradicated, listed in table 2. There are exceptions, but deeper sites, or sites that are prone to inundation during the chemical treatment periods, tend to persist longer. This may reflect poor translocation of herbicide to the roots when the plant produces longer stems to reach the water surface. The eradicated infestations tend to be smaller, possibly reflecting an early stage of invasion which may also reflect limited root and rhizome establishment.

It is clear that chemical treatment can have variable efficacy against water primrose. This may reflect a variety of environmental and site factors, but a better understanding

of application rates, formulations, adjuvants, etc. may provide important details on how this technique can be refined.

It should be noted that at all the persistent sites, water primrose has been reduced to a residual population, and therefore the treatment programmes are clearly working. Across the ten persistent sites, a combined initial coverage of 5260m² has been reduced to a total of 14m². Water primrose is a tenacious plant, and has the ability to reappear as a few isolated plants, despite annual management. A better understanding of how the plant persists, in what form and what management is most appropriate against residual growth, would be an important contribution towards shortening the duration of treatment necessary in order to eradicate infestations.

It is safe to conclude that the goal of eradicating this plant would become extremely challenging if water primrose were allowed to spread from its primary sites of invasion into larger waterbodies.

Thanks

I would like to record my thanks to everyone who has agreed to coordinate the eradication of one or more of the water primrose sites.

Recommendations

- Funding for control is secured for the duration of the eradication programme;
- The 'Be Plant Wise' campaign should be promoted amongst gardeners and the horticultural industry to reduce the incidence of disposal of water primrose, and other invasive non-native plants, into the wild;
- Water primrose recording should be encouraged annually between August and October via social media outlets and recorder groups;
- An analysis of spray records should be undertaken to potentially refine chemical control guidance;
- Site managers are encouraged to establish the nature of persistent water primrose regrowth and how it can be effectively eradicated.

Trevor Renals, Senior Technical Advisor, Invasive Species

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Table 1: persistent sites that have taken longer than average to eradicate

Area	site name	county	site type	approx. size of original infestation (m ²)	2018 aggregate remaining area of Ludwigia (m ²)	earliest record	duration of treatment (years)	management undertaken
Solent & South Downs	Chappel Furlong Farm	IoW	farm pond	1500	1	2008	11	13 spray applications over 7 years, followed by manual digging
Solent & South Downs	Barton on Sea Golf Club 1	Hants	golf course pond	800	1	2001	10	12 spray applications, with manual removal
West Midlands	Pool near Lydney Harbour	Gloucestershire	fishery	150	1	2005	10	manual removal
Wessex	Breamore Marsh	Hampshire	nature reserve pond	300	1	2009	10	9 spray applications over 5 years, mechanical removal, followed by manual removal
Wessex	West Bay	Dorset	ditch	80	1	2009	10	25 spray applications over 10 years, early mechanical removal and manual removal in year 10.
Wessex	Coles Lane Farm	Dorset	farm pond	2000	1	2009	10	spray treatment over 10 years with manual removal and partial in-filling
Kent, South London and East Sussex	Gabriel's Fishery, Lingfield	Kent	fishery	20	2	2011	8	spray treatment over 4 years with manual removal, and manual removal only in last 3 years
West Midlands	Bishampton, Broad lane	Worcestershire	fishery	10	1	2011	8	manual removal only, over a 7 year period
Wessex	Bridgwater Bay SSSI	Somerset	ditch	100	3	2013	6	spray treatment over 6 years, plus partial in-filling
Solent & South Downs	Barton on Sea Golf Club 2	Hants	golf course pond	300	2	2014	5	spray treatment and mechanical removal over a 5 year period

Table 2: eradicated sites

Area	site name	county	site type	approx. size of initial infestation (m ²)	first recorded	last recorded	time taken to eradicate (years)	management undertaken
Kent, South London and East Sussex	WWT London Wetland Centre	London	nature reserve	25	1998	2013	16	10 years of manual clearance, followed by 2 herbicide applications (by weed
Yorkshire	Scarborough	Yorkshire	urban lake	10	2005	2009	1	2 spray applications
Wessex	Sloway Lane to Bleak Bridge	Somerset	river	5	2005	2006	1	1 spray application
Solent & South Downs	Scammell Farm	Hants	farm pond	1100	2008	2010	3	3 spray applications over 2 years
Solent & South Downs	Holden Farm	IoW	farm pond	700	2008	2011	4	8 spray applications over 4 years
Kent, South London and East Sussex	Hever castle ornamental pond	Kent	garden pond	90	2008	2008	1	single spray application
Natural Resources Wales	Garngoch ponds	Swansea	wild lake	3000	2008	2014	7	5 spray applications over 4 years, followed by manual removal over 3 years
Kent, South London and East Sussex	Kidbrooke Green nature reserve	London	urban pond	25	2009	2015	6	single spray application, followed by 5 years of manual removal
East Anglia	Watton	Norfolk	golf course pond	2	2010	2012	3	3 years of manual removal
West Midlands	Nr Frampton Pool SSSI	Gloucestershire	fishery	20	2011	2017	6	manual removal over a six year period
Lincolnshire and Northamptonshire	Gorse Lodge	Lincolnshire	fishery	20	2011	2016	5	single spray (glyphosate and Topfilm) for 5 years
Wessex	Langport	Somerset	ditch	30	2012	2013	2	3 spray applications over 2 years
Herts & North London	Chesham Bois Pond	Buckinghamshire	urban lake	1	2012	2013	3	manual removal over 2 years and subsequent spray
Thames	Twynersh Lakes	Surrey	fishery	15	2012	2014	4	1 spray followed by manual removal over 4 year period
Yorkshire	Harrogate	Yorkshire	farm pond	9	2014	2015	1	single application of glyphosate and Topfilm