



Luronium natans (*Floating Water-plantain*)



This plan is in need of review, it is hoped that a review will be undertaken in 2009.

Floating Water-plantain occurs in a range of freshwater situations but thrives best in open areas with a moderate degree of disturbance, where the growth of emergent vegetation is held in check. Populations of this species can fluctuate greatly in size. In what is believed to be its core natural habitat in the lakes of Snowdonia and mid Wales, this species favours slightly acidic lakes with low nutrient levels (Preston C.D. 1994) that restrict the growth of other plants. From these sites it may have spread eastwards via the canal system (fed by Welsh rivers) and canal sites account for approximately half of the national records (UKBAP 1995); in canal sites this species tends to grow in neutral or slightly basic mesotrophic water (Preston C.D. 1994).

In Shropshire, canal is one of three different freshwater situations where it has been found. It was first found in canal (Llangollen canal near Colemere) in 1880. It is now found, rarely, in the Montgomery Canal on the English side of the Welsh border but has not been recorded there since 1994, when its distribution appears to have diminished to one site only (Aston Locks SSSI); there are several older more widespread records (1880 until the 1980s) and the canal, on the Welsh side, is a key site for this species, such that the canal in Wales has been designated a SAC (it is also an SSSI). Floating Water-plantain tends to flourish best in sections of canal that have been restored i.e. disturbed, but are isolated (usually due to dropped bridges) and infrequently used by boats. Attempts have been made to accommodate this species in canal off-line reserves but with no success in Shropshire.

The second type of site in Shropshire is the mere; meres have no obvious link with Wales and the Floating Water-plantain here may be genetically different. The first record in the county (1796) was from a mere. Once known from several meres, recent records are from Bomere Pool (2003) with an older record from Brown Moss (1986). Loss from meres is likely to be due to eutrophication, a scenario of all the meres, with loss of rare species. Bomere Pool has, for many years, been used for water-skiing and the margins disturbed by wash i.e. emergent vegetation has been held in check; it is one of the least eutrophic meres in Shropshire and falls within an SSSI. Brown Moss has been designated a SAC (because of the presence of Floating Water-plantain); it is also an SSSI and local nature reserve.

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The third type of site in Shropshire is on farmland in the Severn-Vyrnwy floodplain, in a pool with fluctuating water levels, a silty clay substrate and grazed by cattle. The site lies in an area which is subjected to prolonged flooding in winter but which dries out in late summer. This is a very localised but flourishing population that, in summer, may be found in a robust terrestrial form (one of three forms for this species). This site was only discovered in 2003 and appears to be the only farmland site in Britain; it has thus added a new dimension to previous comments and ideas regarding this species.

1 Objectives and Targets

1.1 Objectives

- A. Protect and maintain the known sites of *Luronium natans* in Shropshire.
- B. Establish and maintain a comprehensive understanding of the ecological requirements of *Luronium natans* in Shropshire through research, survey and monitoring.
- C. Extend the geographical range of *Luronium natans* by re-creating connectivity, between the English and Welsh sections of the Montgomery Canal and off-line reserves, to facilitate re-colonisation. Re-location of plants to canal off-line reserves should also be employed.
- D. Promote communication, education and awareness of the status and needs of *Luronium natans*.

1.2 Targets

- Maintained presence of *Luronium natans* at all known sites as, at least, a group of plants at each site and with evidence of spreading by stolons.
- Further studies, relating to the ecological requirements of *Luronium natans* to have been carried out by 2008 to ensure some success in re-colonisation and re-location to canal off-line reserves.
- Genetic studies on sites other than canals, carried out by 2007, to try and establish if there is more than one source site, for use in re-location.
- A large new off-line reserve established with an aquatic area of 4.5 ha, equivalent to the present canal (CMS 2005), which is now effectively lost to species that cannot tolerate motorised boat traffic. The new reserve should be designed, in part, to meet the ecological requirements (found in the above and past studies) of *Luronium natans*, should have continuity with the canal and with other off-line reserves, and should be no wider than 30 ms (by 2010).
- The dry section of the Montgomery Canal (Gronwen to Llanymynech, 6 km) restored, with attention to channel profile and canal bed materials, to re-connect Welsh and English sections by 2015.
- A more widespread presence established, by re-colonisation and re-location, along the Montgomery canal in Shropshire or, at least, in off-line reserves, by 2010. Return of *Luronium natans* to Brown Moss by effective management.
- Inflows to the canal designed to enable shutoff of water flow to protect against major pollution incidents (by 2010).
- Water quality maintained at all sites, through promotion of agri-environmental schemes generally (by 2010).
- Good water transparency maintained in canal off-line reserves, if necessary using silt screens (by 2010).

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- All farms in the area of all the known sites entered into the Higher Level Stewardship scheme with at least buffer zones established and grazing levels reviewed by 2008.
- Re-located plants of this species monitored annually with presence maintained, at least, in new reserve (s).
- Condition assessment of the off-line canal reserves carried out 3 yearly (using Common Standards Monitoring); these should attain favourable condition by 2010. Standards required include the presence of a number of positive species (see CMS 2005); *Luronium natans* should be added to this list since it is, historically, a member of this part of the canal.
- Condition assessments of open water at Bomere Pool and Brown Moss SSSIs to reach at least 'unfavourable, recovering' by 2010.
- Improvement (for conservation) of the navigable canal channel, with development and maintenance of soft banks and 1 metre of marginal vegetation, along each side, south of Keeper's Bridge (CMS 2005) by 2010.
- All canal off-line reserves and all *Luronium natans* sites designated at some level (preferably as SSSIs) by 2010.

2 Current Status

2.1 Importance

Luronium natans is endemic to Europe. It is predominantly a western European species but extends eastwards into Yugoslavia, Bulgaria and Poland. It is rare and decreasing over much of its European range. Britain holds a significant population of this species which has, therefore, been included in the most recent Red Data List (2005); on this list it falls into the category of 'Least Concern' since it is strictly a nationally scarce, not rare, plant. Its largest and most extensive population in Britain is in the Montgomery Canal in Wales. Many of its sites in Britain are now designated SACs.

2.2 Trends

Luronium natans appears to have always been localised in the UK. In the past, however, it occurred in a variety of other natural habitats including lowland lakes and pools, streams, ditches and slow-moving rivers. In Shropshire it was found in several meres, pools and rivers, with early records from such sites dating from the late 18th and early 19th century.

The last river record was in 1924 and the number of mere sites declined. Eutrophication and algal blooms have probably been the main factors in this decline. Records in canals in Shropshire began in the late 19th century and the number of sites increased until the 1980s. Restoration of the Montgomery canal, with subsequent use of some sections by motorised boat traffic, has coincided with almost complete loss of this species in the Shropshire section, although pollution is also thought to be a contributory factor (Newbold 2001).

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2.3 Population and Distribution

Nationally *Luronium natans* is localised, with recent records from Wales, the West Midlands and northern England; it also occurs as an introduction to the Norfolk Broads and a few localities in Scotland. The species has been recorded from 52 ten km squares since 1987 (Atlas 2000) with approximately half of them from canals (UKBAP 1995) i.e. it is a nationally scarce plant. The largest and most extensive population in Britain is in the Welsh part of the Montgomery canal.

There are three post 1990 Shropshire populations. The canal population is clearly unstable since the number of canal records has become reduced to one site and that not since 1994. The frequency of this species in the continuation of the canal into Wales provides considerable opportunity for it to regain ground. The Bomere site could be considered to be stable since this species has been noted from this site over a span of 130 years but condition assessment of the mere was 'unfavourable, no change' in 2004. The farmland site appears to be a vigorous population but its history is unknown; this site is particularly vulnerable to changes in farming methods. Records from the 1980s are from the canal and from Brown Moss. Brown Moss has proved to be unstable for this species; there have been changes to water levels (to facilitate fishing and through natural causes), loss of common land grazing and now seasonal presence of numerous Canada Geese. Clearing the pool margins of trees appears to have raised the water levels (Whild et al 2004).

2 Current Factors Affecting the Species:

Nationally, this species has been affected by conifer planting in the west (and water acidification), canal neglect, canal restoration with boat traffic producing turbidity, and eutrophication of water bodies.

In Shropshire many of these and some other factors apply as follows:

- Fertilizer run-off and eutrophication of water bodies, with associated algal blooms (rivers and meres).
- Disturbance, usually by motor boat activity, causing turbidity of the water (canal).
- Spread of tall marginal vegetation (includes woody species) due to lack of grazing and/or increased nutrient levels (Brown Moss)
- Changes in grazing regimes and species; seasonal grazing by cattle appears to be appropriate.
- Loss of original substrate (puddled clay over limestone blocks) in canals; this factor applies more to the canal off-line reserves and may be a factor contributing to the lack of success in relocation of *Luronium natans*.

4 Current Action

4.1 Policy and Protection

- Listed on Annexes II and IV of the Habitats Directive and Appendix I of the Bern Convention
- Protected under the Schedule 4 of the Conservation (Natural Habitats, etc) Regulations 1994 and Schedule 8 of the Wildlife & Countryside Act (1981)

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- It is also listed under the following categories:
 - Red Data plant list (2005); internationally important; 'least concern'
 - Scarce British Plants
 - UKBAP (1995)
 - UK Species of Conservation Concern short list (1995)
 - Shropshire Species of Conservation concern (1996)
- The Montgomery Canal in Wales is an SSSI and a SAC; the primary reason for its selection for the latter is the presence of a large population of *Luronium natans*.
- Part of the Montgomery Canal in Shropshire is SSSI (Aston Locks to Keeper's Bridge).
- Bomere Pool is part of the Bomere, Shomere and Betton Pools SSSI.
- Brown Moss has been designated a SAC because of the presence of *Luronium natans*.
- Brown Moss is an SSSI and a Local Nature Reserve (Shropshire County Council).
- Brown Moss and Bomere Pool lie within the Midland Meres and Mosses Ramsar site
- The 2000 Countryside and Rights of Way Act requires positive management of SSSIs.
- The Severn-Vyrnwy site has no status

4.2 Management, Research and Survey

- Both Brown Moss and the Welsh part of the Montgomery Canal have recently become Special Areas of Conservation.
- A Conservation Management Strategy was prepared in 2005, to provide a framework for the future restoration of the Montgomery Canal (in both Shropshire and Wales); this was prepared under the guidance of the Montgomery Canal Partnership which includes several bodies such as CCW, EN, BW, EA and EH. There has always been conflict between those involved with the canal's restoration and those concerned with conservation of its uncommon species; there has therefore had to be some compromise and the importance of canal off-line refuge sites is clear. Several such sites have been created for wildlife but *Luronium natans* has not yet been relocated successfully in Shropshire. A large new reserve to 'replace' the existing aquatic area of the canal has been proposed, with management to reach higher standards than previously attained. Some improvements (for conservation) to the canal channel have also been proposed.
- Common Standards Monitoring Guidance for canals was introduced in 2005 by JNCC; this was adapted for the Montgomery Canal in 'Montgomery Canal Conservation Objectives and Standards' drawn up by CCW and EN in April 2005.
- The Shropshire part of the Montgomery Canal is considered to be in unfavourable condition (decline in aquatic plant assemblage and water quality, with turbidity) due to recent dredging and re-opening to navigation (also unfavourable in Wales in 2003, although favourable in respect of *Luronium natans*).
- The open water at both Brown Moss and Bomere Pool have been assessed as being in 'unfavourable condition, no change' (BM 2005, BP 2004).

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- The new agri-environmental schemes were introduced in 2005 and many farms in the county have already entered into the Higher Level Stewardship.
- The global status of *Luronium natans* was re-assessed in 2005 against IUCN criteria for rare species; although it does not match any of the categories, it is scarce in Britain, which holds a significant proportion of its global population.
- The Montgomery Canal surveys, particularly BW's survey of 1988 prior to restoration (and another in 1997), have provided good baseline material for monitoring purposes in Shropshire. The canal reserves survey (Newbold 2003) provides a good baseline for future monitoring of reserves.
- Genetic studies have been carried out on some populations.

5 Key Habitats

Nationally:

- Slightly acidic lakes with low nutrient levels and some fluctuation in water levels
- Canals with neutral to slightly basic mesotrophic water, and with periodic disturbance
- Rarely, slow-moving mesotrophic river

Locally, as above, with the following detail:

- Canal, much of which is fed by Welsh rivers (restored but with no or little motorised boat traffic)
- Small pools with fluctuating water levels and grazing or past history of grazing, sometimes fed by Welsh rivers during winter flooding
- Large open mere (almost totally surrounded by woodland, with margins disturbed by wave action).

6 Complementary Plans

UK	<i>Luronium natans</i> SAP (lead partner BW)
UK	<i>Potamogeton compressus</i> SAP (lead partner BW)
UK	Coastal and floodplain grazing marsh HAP
UK	Eutrophic standing waters HAP
UK	Mesotrophic lakes HAP
UK	Standing open water Broad Habitat Statement
UK	Canals Broad Habitat Statement
UK	Rivers and streams Broad Habitat Statement
Shropshire	Standing open water HAP
Shropshire	Floodplain grazing marsh HAP
Shropshire	Rivers and streams HAP
UK & Shropshire	SAPs for other species e.g. Club-tailed Dragonfly, Water Vole and Great Crested Newt.

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5. Action Plan

Habitat / Species	Action code	Action text	Location of action	Start date	End date	Lead	Assisting
<i>Luronium natans</i>	SHR FWP AP 02	Integration of <i>Luronium natans</i> with floodplain grazing marsh HAP.	Edgerley	2006	-	RS	FWAG, SC, SWT
<i>Luronium natans</i>	SHR FWP AP 03	Integration of <i>Luronium natans</i> SAP with Shropshire Rivers & Streams HAP, particularly in relation to water quality and flood alleviation.	Edgerley Canal	2006	-	EA	NE, SC
<i>Luronium natans</i>	SHR FWP AP 04	Monitor known sites for continued presence; also monitor new reserves for colonisation and/or monitor re-location sites.	All known sites	2006	2010	BW	SBS SC
<i>Luronium natans</i>	SHR FWP HC 01	Restore the dry section of the Montgomery Canal, using best possible methods	Montgomery Canal	2006	2015	BW	
<i>Luronium natans</i>	SHR FWP HC 02	Create off-canal refuge site (s) with an aquatic area equalling that of the present canal. Land will need to be acquired for the reserve (s).	Montgomery Canal	2006	2010	BW	
<i>Luronium natans</i>	SHR FWP HC03	Achieve favourable management through sensitive canal restoration and management, as proposed in the CMS.	Non-SSSI areas of the Montgomery Canal	2006	2010	BW	
<i>Luronium natans</i>	SHR FWP HS 02	Achieve favourable management at designated sites; on some sites this will require regular cutting of marginal vegetation with removal of cuttings.	Montgomery Canal, Bomere Pool and Brown Moss.	2006	2010	SC C&R team	SC
<i>Luronium natans</i>	SHR FWP HS 03	Ensure similar grazing levels continue (as in 2004) and that grazing continues to be by cattle at Edgerley.	Edgerley	2006	2008	RS	NE SC
<i>Luronium natans</i>	SHR FWP HS 04	Re-introduce cattle or horse grazing at Brown Moss	Brown Moss	2006	2010	NE	SC C&R team
<i>Luronium natans</i>	SHR FWP HS 06	Phase dredging activities, see CMS.	Montgomery Canal	2006	ongoing	BW	
<i>Luronium natans</i>	SHR FWP HS 08	Control effects of pollution by having inflow control (canal) and buffer zones	All sites	2006	2008	BW SC	RS FWAG

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<i>Luronium natans</i>	SHR FWP HS 09	Control woody species on water body margins, where there is no grazing, particularly on sites historically grazed	Montgomery Canal Brown Moss	2006	ongoing	BW	SC C&R team SC
<i>Luronium natans</i>	SHR FWP HS 10	Water level management; repair breaches in canal, also woody species control, particularly at Brown Moss	Montgomery Canal Brown Moss	2006	ongoing	BW NE	SC C&R team
<i>Luronium natans</i>	SHR FWP RE 02	Develop techniques that will lead to successful re-colonisation and relocation of this species in off-line reserves.		2006	2008	BW	SC
<i>Luronium natans</i>	SHR FWP SM 02	Species-specific habitat creation may need to be incorporated into new canal off-site reserves.	Montgomery Canal	2006	2010	BW	MCP
<i>Luronium natans</i>	SHR FWP SU 01	Monitor for presence, at least, in present and old sites, and in relocation sites. In the canal this could be done in conjunction with the suggested canal and reserves condition assessment	All sites, with special attention to the canal and canal off-line reserves.	2006	2009	BW SBS	
<i>Luronium natans</i>	SHR FWP SU 02	Survey Brown Moss for <i>Luronium natans</i> at least twice by 2015.	Brown Moss	2009	2015	SC C&R team	

Key to organisations

BW	British Waterways	NE	Natural England
RS	Ruralscapes	SC C&R team	Shropshire Council Conservation & Ranger Team
FWAG	Farming and Wildlife Advisory Service		
SC	Shropshire Council		
SBS	Shropshire Botanical Society		
EA	Environment Agency		

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