

**European Community Directive  
on the Conservation of Natural Habitats  
and of Wild Fauna and Flora  
(92/43/EEC)**

Supporting documentation for the  
Third Report by the United Kingdom under  
Article 17

on the implementation of the Directive  
from January 2007 to December 2012  
Conservation status assessment for

Species:

S1831 - Floating water-plantain (*Luronium natans*)

**IMPORTANT NOTE – PLEASE READ**

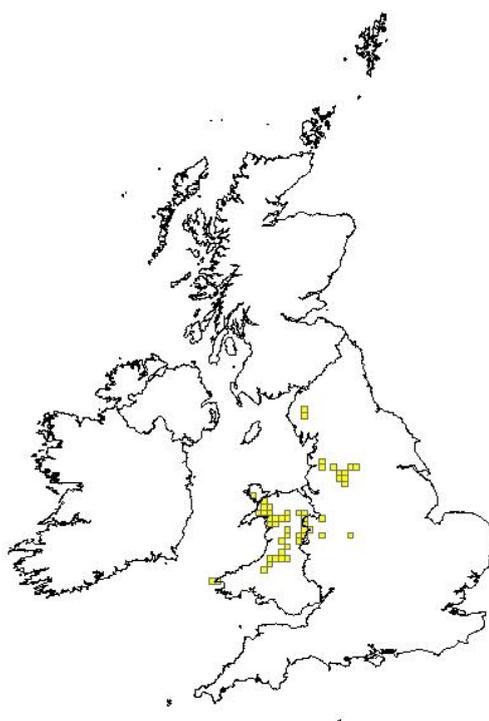
- The country-level reporting information contained in this document is a contribution to the Article 17 UK report for the habitat/species concerned.
- It has been provided by **Natural Resources Wales** and refers only to the state of the habitat/species in **Wales** - it does not constitute an assessment for the whole of the UK.
- The Article 17 UK Approach document provides details on how this information has been used and, combined with information supplied by other Statutory Nature Conservation Bodies
- The format of the document is closely aligned to that set out by the European Commission for Member State reporting – as a result, some of the fields are not applicable at a country-level and have deliberately been left blank – in addition, the content of most fields is constrained by the EC reporting categories.

As of 1 April 2013, the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales became Natural Resources Wales/Cyfoeth Naturiol Cymru

**Reporting format on the 'main results of the surveillance under Article 11' for Annex II, IV & V species**

<i>Field name</i>	<i>Brief explanations</i>	
<b>0.2 Species</b>	<b>0.2.1 Species code</b>	<b>S1831</b>
	<b>0.2.2 Species scientific name</b>	<b><i>Luronium natans</i></b>
	<b>0.2.3 Alternative species scientific name</b> Optional	
	<b>0.2.4 Common name</b> Optional	<b>Floating water-plantain</b>

<b>1.1 Maps</b>		
<b>1.1.1 Distribution map</b>		<b>Sensitive</b> <b>False</b>



<b>1.1.2 Method used - map</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b>
	Thorough, quantitative surveys for such a widespread species would require major effort, especially in its remote mountain lake localities. The data on deep-water (2m+) populations is, therefore, largely partial / extrapolated but the more accessible lowland sites are relatively well-mapped..
<b>1.1.3 Year or period</b>	<b>2001-2011</b>
	Data from before 2007 (post 2001) is included here, as there are only infrequent records for this inconspicuous and relatively inaccessible

	species and monitoring data (eg. Chater, 2010) shows that populations can very often persist in the same site over long periods. For that reason, older records (back to 2001), particularly in oligotrophic lakes, can generally be represent occurrence in the reporting period.
<b>1.1.4 Additional distribution map</b>	<b>False</b>
<b>1.1.5 Range map</b>	

<b>2.1 Biogeographical region &amp; marine regions</b>	<b>ATL</b>
<b>2.2 Published sources</b>	<p><b>"Botanical Society of the British Isles Distribution Database <a href="http://bsbidb.org.uk">bsbidb.org.uk</a></b></p> <p><b>Burgess, A., Goldsmith, B. &amp; Hatton-Ellis, T. (2006) Site Condition Assessments of Welsh SAC and SSSI Standing Water Features. Countryside Council for Wales Contract Science Report No: 705</b></p> <p><b>Burgess, A., Goldsmith, B., Hatton-Ellis, T., Hughes, M. &amp; Shilland, E. (2008) CCW Standing Waters SSSI Monitoring 2007-08. Countryside Council for Wales Contract Science Report No. 855</b></p> <p><b>ECUS Environment Consultancy (2010), Montgomery Canal Monitoring Report 2009. Unpublished Report to British Waterways. Ellesmere.</b></p> <p><b>Evans, D. &amp; Jones, D. (1994) Vegetation in Llyn Glasfryn, 1994. Internal Report, Countryside Council for Wales.</b></p> <p><b>Chater, A.O. (2010) Flora of Cardiganshire. Aberystwyth 730pp</b></p> <p><b>Creer J. (2007) Draft Monitoring report of Luronium Natans within Afon Gwyrfa and Llyn Cwellyn SAC. CCW internal report.</b></p> <p><b>Duigan CA, Monteith DT, Carvalho L, Bennion H, Hutchinson J, Seda JM, Evans F. (2003) The current ecological and conservation status of Llyn Tegid (Bala Lake), Snowdonia National Park, and aspects of its management. In: Llyn Tegid Symposium - The ecology, conservation and environmental history of the largest natural lake in Wales, 27-48, University of Liverpool.</b></p> <p><b>Evans F, Benoit PM. (2003) Wetland and aquatic plants on the margins of Llyn Tegid. In: Llyn Tegid Symposium - The ecology, conservation and environmental history of the largest natural lake in Wales, 79-92, University of Liverpool</b></p> <p><b>Gill A, Pepper A, Eaton JW, McAllister H, Neame C. (2005) Restoring the Afon Teifi at Cors Caron National Nature Reserve: a Project Plan. 685. 2005. Bangor, Countryside Council for Wales.</b></p> <p><b>Hatton-Ellis, T. (.2005) Llyn Glasfryn Site Visit. Internal report to Countryside Council for Wales</b></p> <p><b>Jones RA. (1996) Luronium natans (Floating water-plantain) at Llyn Tegid SSSI. Unpublished report to Countryside Council for Wales</b></p> <p><b>McCarthy, W. &amp; Dines, T.D. (2008) Rare Plant Register for Caernarfonshire. Botanical Society of the British Isles</b></p>

	<p><b>Miller J. (1999) A Study of the Habitat and Ecology of Floating Water-Plantain (<i>Luronium natans</i> (L.) Raf.) in Two Welsh Lakes, Comparing the use of Diving with Conventional Aquatic Macrophyte Survey Techniques.</b></p> <p><b>Southey, J. &amp; Broughton-Scott D. (2004) Development of monitoring methods to assess the condition of the 'Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and / or of the Isoeto-Nanojuncetea' Natura 2000 habitats and the <i>Luronium natans</i> population at Afon Teifi SAC. 13. Bangor, Countryside Council for Wales.</b></p> <p><b>Newbold, C (2001) The Montgomery Canal a Macrophyte Survey. Unpublished report for British Waterways.</b></p> <p><b>Thorne, A.K. &amp; Wainwright, M. (2009) The Rare Plants of Montgomeryshire. Botanical Society of the British Isles. 107pp</b></p> <p><b>Miller J. A Study of the Habitat and Ecology of Floating Water-Plantain (<i>Luronium natans</i> (L.) Raf.) in Two Welsh Lakes, Comparing the use of Diving with Conventional Aquatic Macrophyte Survey Techniques. 1999.</b></p> <p><b>Ref Type: Report</b></p> <p><b>Southey J, Broughton-Scott D. Development of monitoring methods to assess the condition of the 'Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and / or of the Isoeto-Nanojuncetea' Natura 2000 habitats and the <i>Luronium natans</i> population at Afon Teifi SAC. 13. 2004. Bangor, Countryside Council for Wales.</b></p> <p><b>Ref Type: Report</b></p> <p><b>14. Willby NJ, Eaton JW. (1993) The distribution, ecology and conservation of <i>Luronium natans</i> (L.) in Britain. <i>Journal of Aquatic Plant Mangement Society</i>, 31, 70-76.</b></p> <p><b>15. Willby NJ, Abernethy VJ, Demars BOL. (2000) Attribute-based classification of European hydrophytes and its relationship to habitat utilization. <i>Freshwater Biology</i>, 43, 43-74."</b></p>
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<b>2.3 Range</b>	
<b>2.3.1 Surface area Range</b>	
<b>2.3.2 Method used Surface area of Range</b>	<p><b>Estimate based on partial data with some extrapolation and/or modelling</b></p> <p>Thorough, quantitative surveys for such a widespread species would require major effort, especially in its remote mountain lake localities. The data on deep-water (2m+) populations is, therefore, largely partial / extrapolated but the more accessible lowland sites are relatively well-mapped.</p>
<b>2.3.3 Short-term trend Period</b>	<p><b>2001-2012</b></p> <p>Data from before 2007 (post 2001) is included here, as there are only infrequent records for this inconspicuous and relatively inaccessible</p>

	species and monitoring data (eg. Chater, 2010) shows that populations can very often persist in the same site over long periods. For that reason, older records (back to 2001), particularly in oligotrophic lakes, can generally be represent occurrence in the reporting period.	
<b>2.3.4 Short term trend Trend direction</b>		
	Most of the additional post 2001 10km sq (and some finer scale) records, eg SH62, SH94, SN96 & SN54 are newly discovered, already extant populations and not the results of active dispersal or a real increase in range. Some apparent losses eg SH53 are also due to revising earlier, mistaken locality data. There does seem to be a genuine loss in range, however, in at least one lowland lake (Llyn Glasfryn, SH4042), in one upland site (Llyn Cwmffynnon, SH6456) - assuming a correct earlier identification - and in parts of the canal system (eg. SJ286397).	
<b>2.3.5 Short-term trend Magnitude</b>	<b>a) Minimum</b>	
	The probable disappearance at Llyn Glasfryn SH4042 and in sections of the Llangollen canal g. SJ23 & SJ24 might have occurred prior to 2001. These represent genuine declines at the edge of the species' range. The possible disappearance at Llyn Cwmffynnon SH65 would have taken place around the same time within the species' core range. Both trends are compromised, however by the more recent discovery of numerous, previously-overlooked populations in rivers and upland lakes and indicate that the species' earlier range assessments were significantly underestimated.	
	<b>b) Maximum</b>	
	There is good evidence of recent, post 2001 range expansion in small sections of the canal system (eg. SJ2511) and a possible recolonisation here from native river / lake populations (at SJ2142). There is also evidence of very local expansion within heathland pools eg. SM62 (a new 10km sq locality but only 70m from the SM72 hectad boundary) and fluctuations in natural lake populations modified to form reservoirs (eg. Llyn Teifi and Llyn Egnant SN7868 & SN7967).	
<b>2.3.6 Long-term trend Period</b>		
	The two significant losses in range over the last 24 years (from Llyn Glasfryn, SH4042 and Llyn Cwmffynnon, SH6456 - if it was correctly identified there) continue earlier disappearances, eg. from Anglesey lakes in SH36-37 and upland sites (eg. Llyn Idwal SH65) prior to c.1970. The disappearance from parts of the Llangollen Canal (and the apparent recolonisation there) also continue a long-term, pre-1970 trend of expansion and regional decline.	
<b>2.3.7 Long-term trend Trend direction</b>		
	The long term trend in parts of the range edge is a gradual decline (especially in the canal system where there have previously been earlier, short-term expansions). By contrast, the core range rivers and upland lakes appears relatively stable - although marked by some fluctuation and local instances of decline - reinforced by extensive new discoveries.	
<b>2.3.8 Long-term trend</b>	<b>a) Minimum</b>	

<b>Magnitude</b>  Optional	The visible trend in long term decline (minus redeterminations and new discoveries) could be an overestimate, if small and relatively inaccessible colonies still remain at some of these supposedly lost colonies.	
	<b>b) Maximum</b>	
	The visible trend in long term decline could have also perhaps failed to register the disappearance of other inconspicuous and relatively inaccessible populations. Given the relative stability of deep water populations, however, there is a slightly greater likelihood of overestimating the decline.	
<b>2.3.9 Favourable reference range</b>	<b>a) Value in km<sup>2</sup></b>	
	<b>b) Operator for FRR</b>	
	<b>c) FRR is unknown (indicated by "true")</b>	<b>False</b>
	<b>d) Method used to set FRR</b>	
<b>2.3.10 Reason for change</b>  Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to...	<b>a) Genuine change?</b>	<b>True</b>
	Range losses in the canal system are thought to result from over-disturbance by boat traffic and excessive channel clearance. The disappearance from Llyn Glasfryn represents another continuing trend (as with the lakes in Anglesey), resulting from eutrophication. Other losses (ie. Llyn Cwmffynnon) are mysterious but could result from diffuse pollution (eg acid rain / nitrogen) or represent earlier misidentification.	
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	There is considerably improved knowledge of this species' distribution and abundance, due to better identification materials, targeted surveillance / surveys and monitoring of known population sites.	
	<b>c) Use of different method (e.g. "Range tool")?</b>	<b>False</b>
	It is unknown whether use of a different method (eg. "range tool") will have produced change.	

**2.4 Population**

<b>2.4.1 Population size estimation</b> (using individuals or agreed exceptions where possible)	<b>a) Unit</b>	
	<b>b) Minimum</b>	
	<b>c) Maximum</b>	
<b>2.4.2 Population size estimation</b> (using population unit other than individuals) Optional ( <i>if 2.4.1 filled in</i> )	<b>a) Unit</b>	<b>number of localities</b>
	Individual localities in canals and rivers are defined as colonies separated by more than 1km. This clarifies the definition used in 2007 (where river and canal populations were treated as single localities) and more accurately reflects the discontinuous distribution of this plant in specific parts of occupied watercourses. The definition is also subject to approximation, however (and perhaps especially in highly artificial habitats, such as canals), due the inconspicuous nature of submerged colonies - and possibility of continuous colonies occurring between named localities - and fluctuations caused by local extinctions and introductions. The definition is thus somewhat arbitrary (since notionally separate localities are almost certainly connected to some extent) and this is reflected in the wide range of maximum and minimum number of population size.	
	<b>b) Minimum</b>	<b>40</b>
	The number of localities in rivers and canals is open to interpretation, even where relatively clear survey data exist. Inconspicuous colonies may exist in between well-characterised sites, effectively creating a single locality where previous searches have recorded two populations and there are significant annual fluctuations in the canal population leading to the possibility of new localities for the species or a local disappearance. The best available data (bsbidb.org and ECUS, 2010) indicate the presence of at least 3 separate localities in the Afon Teifi SAC but give only uncertain and approximate information for the Montgomery Canal SAC and Llangollen Canal. Previous reporting rounds have reported "four or five separate colonies" in the Montgomery Canal but treat these (and, by implication, the equally scattered colonies in parts of the Llangollen Canal) as single sites. Adopting this minimal approach the Canal populations remain unchanged - although improved survey data on the Afon Teifi reveal an increase in the extents of recorded <i>Luronium</i> (although this is almost certainly not a genuine increase in range).	
	<b>c) Maximum</b>	<b>51</b>
(See note 2.4.2b, above) Previous reporting found "four or five" sites for <i>Luronium</i> in the Montgomery Canal SAC but aggregated these as one site. In view of wider discoveries in the river habitat (especially in the Afon Teifi SAC) these colonies - and those in the Llangollen Canal - are better understood as individual localities. The best available data (see previous) clearly shows more than 4-5 colonies in the Montgomery Canal and an aggregate of records back to 2001 shows at least 10 localities separated by more than 1 km (and 3 such localities in the Llangollen Canal).		
<b>2.4.3 Additional information on population estimates / conversion</b> Optional	<b>a) Definition of "locality"</b>	<b>A "locality" is a defined water body: either an individual lake, stretch of canal or river separated from the nearest population by more than 1km or group of</b>

		<b>heathland pools separated from the nearest neighbour by &gt;1km of unsuitable habitat.</b>
	Individual localities can sometimes coincide, most significantly in populations extending from a standing water (ie a lake) into the adjacent river. These are classed as one locality where the population does not extend for more than c.25 m downstream.	
	<b>b) Method to convert data</b>	
	<b>c) Problems encountered to provide population size estimation</b>	
<b>2.4.4 Year or period</b>	<b>2001-2012</b>	
	Given the fact that survey work on distribution has delivered the population unit data, see note 1.1.3	
<b>2.4.5 Method used Population size</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b>	
	The definition of localities for <i>Luronium</i> needs approximation, especially in lengths of continuous and disturbed watercourse (such as canals: see notes to 2.4.2b & c, above). There is significant variation in the age and extents of site information: individual localities for <i>Luronium</i> generally being confirmed by at least presence / absence data (eg in remote upland lakes) and more frequently described in terms of cover-abundance and reproductive vigour (in most rivers, heathland pools and a large number of lakes and regularly visited lengths of canal). There is also significant lack of detail in the larger and more remote lake populations and, also, in certain stretches of canal. Additionally, there is a significant area of potential habitat (especially in small parts of the river system and in deep, remote mountain lakes) that remains to be thoroughly surveyed. The occasional discovery of new, previously undetected localities for <i>Luronium</i> shows how the current population size data is likely to be partial and contain a degree of approximation.	
<b>2.4.6 Short-term trend Period</b>	<b>2001-2012</b>	
	As for 2.3.3	
<b>2.4.7 Short-term trend Trend direction</b>	<b>decrease &gt;1%/year</b>	
	Likely decline, as evidenced by disappearance from SH44 and small populations fluctuating in the canal system at SJ24 and SJ22 etc.	
<b>2.4.8 Short-term trend Magnitude</b>	<b>a) Minimum</b>	<b>2</b>
	At least one locality out of c.49 (=2% decline).	
	<b>b) Maximum</b>	<b>2</b>
	The disappearance from SH44 represents a greater than 2% range decline in Wales. As the exact maximum extent is unclear a 2% value	

	has again been provided.	
	<b>c) Confidence interval</b>	
<b>2.4.9 Short-term trend Method used</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b>	
	Thorough, quantitative surveys for such a widespread species would require major effort, especially in its remote mountain lake localities. The data on deep-water (2m+) populations is, therefore, largely partial / extrapolated but the more accessible lowland sites are relatively well-mapped.	
<b>2.4.10 Long-term trend – Period</b>	<b>1989-2012</b>	
	Only post-1989 records are included in this report (although older records may be used to indicate the direction of longer term trends).	
<b>2.4.11 Long-term trend Trend direction</b>	<b>decrease</b>	
	Despite annual fluctuations and very local movement (in rare instances crossing the 10km boundaries - as at SM62 - appearing to give range expansion), the long term trend is a decline in range, especially in Anglesey, Lleyn and the canals of NE Wales. This trend is masked by redeterminations (where inaccurate former records such as SH53 exaggerate the trend) and a significant number of newly discovered populations in upland lakes.	
<b>2.4.12 Long-term trend Magnitude</b>	<b>a) Minimum</b>	<b>4</b>
Optional	Disappearance from SH44 and probably SH37 (if correctly determined) represents a loss of 2 localities from a total of c.50 or about 4% decline in this period.	
	<b>b) Maximum</b>	<b>4</b>
	See note 2.4.12a	
	<b>c) Confidence interval</b>	
<b>2.4.13 Long term trend Method used</b>	<b>2</b>	
	As for note 2.3.2 etc.	
<b>2.4.14 Favourable reference population</b>	<b>a) Number of individuals/agreed exceptions/other units</b>	
	<b>b) Operator</b>	

	<b>c) FRP is unknown indicated by "true"</b>	<b>False</b>
	<b>d) Method used to set FRP</b>	
<b>2.4.15 Reason for change</b> Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	<b>a) Genuine change?</b>	<b>True</b>
	The majority of change between current distribution and the former reported range in 2001 is due to new discoveries (of long extant populations) and revisions to former inaccurate records. The distribution of <i>L. natans</i> has also undergone a significant change in this period, however, in its disappearance from SH44 and recolonisation in the canals around SJ2511.	
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	As in the previous note, 2.4.15b, there continues to be an improvement in survey data (recording new sites) and analysis of historic materials (occasionally deleting misidentified records).	
	<b>c) Use of different method (e.g. "Range tool")?</b>	<b>False</b>

<b>2.5 Habitat for the species</b>	
<b>2.5.1 Area estimation</b>	<b>15.6</b> This records the surface area of occupied water bodies rather than just the zone of active growth (around lake margins, for instance) but does not extend to the wider catchment. The habitat for <i>Luronium</i> is relatively localised, especially in large lakes but this clearly incorporates the whole water body. It is impractical, however, to extend this area of occupancy to the wider catchment.  There is thought to be a sufficient amount of habitat in the UK to support a viable population of the species.
	<b>2.5.2 Year or period</b> <b>2001-2012</b> Including records from before 2007, since it is impractical to conduct frequent surveys for <i>Luronium</i> over the whole of Wales and there is consequently no more recent data on several localities.
<b>2.5.3 Method used Habitat for the species</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b> The surface area of habitat for <i>Luronium</i> has has been calculated from

	Ordnance Survey data on water bodies and the list of known localities in Botanical Society of the British Isles distribution database.	
<b>2.5.4 Quality of the habitat</b>	<b>a) Habitat quality</b>	<b>Moderate</b>
	All the native river and heathland pool populations and the majority of populations in upland, stony-bottomed lakes are judged to be in good habitat. However, a small proportion of the upland lake habitat and a large proportion of the canal habitat is evidently in poor condition (largely as a result of eutrophication, recreational pressures and perhaps invasive species).	
	<b>b) Assessment method</b>	<b>Luronium has a relatively wide ecological amplitude and its presence is the best indicator of habitat condition. The quality of habitats is therefore assessed, in the first instance, on presence - absence data, with more detailed distribution and abundance records to provide finer-grained habitat assessment.</b>
<b>2.5.5 Short-term trend Period</b>	<b>2001-2012</b>	
	As for 2.3.3	
<b>2.5.6 Short-term trend Trend direction</b>	<b>decrease</b>	
	As for 2.4.7 (since the species is itself the best indicator of habitat)	
<b>2.5.7 Long-term trend Period</b>	<b>1989-2012</b>	
	Only post-1989 records are included in this report (although older records may be used to indicate the direction of longer term trends).	
<b>2.5.8 Long-term trend Trend direction</b>	<b>decrease</b>	
	The long term trend for this habitat is the same as for the species (as in note 2.4.11), since the species is the best indicator of habitat.	
<b>2.5.9 Area of suitable habitat for the species</b>	<b>a) Value in km<sup>2</sup></b>	<b>20</b>
	Luronium has a relatively wide ecological amplitude but it appears somehow restricted within its current range despite wider areas of apparently suitable habitat. There are numerous oligotrophic lakes with all the generally associated species apart from <i>Luronium natans</i> and this plant has been found to spread (vigorously) into new habitat in the canals. It is thought, therefore, that <i>L. natans</i> is restricted by unknown factors from occupying wider habitat and might expand its range given better dispersal vectors. At the same time, numerous oligotrophic lakes are unoccupied within the historic dispersal range of <i>L. natans</i> so this unoccupied territory cannot be very wide. An approximately 25% range for expansion is given here, to indicate a habitat potential for this species in Wales but this is no more than a hypothetical figure, calculated on the basis of water body surface areas in Ordnance Survey data.	
	<b>b) Absence of data indicated as '0'</b>	
<b>2.5.10 Reason for change</b>	<b>a) Genuine change?</b>	<b>True</b>
Is the difference between the value reported at 2.5.1 and the previous reporting round mainly due to	Despite the range of new localities, the annual fluctuations and the redetermination of erroneously identified material there is enough	

	evidence of decline at lowland localities (eg. SH44) to record this as a genuine change.	
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	The improved identification skills and survey techniques have contributed to this more accurate assessment (including the extension of the species' known range in formerly undiscovered localities and the redetermination of earlier inaccurate records).	
	<b>c) Use of different method (e.g. "Range tool")?</b>	<b>False</b>

2.6 Main pressures		
a) Pressure	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
G01: Outdoor sports and leisure activities, recreational activities	M	
F02: Fishing and harvesting aquatic resources	L	P
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	P

High levels of motorised recreational boat traffic (in canals) and water pollution continue to be threats from the last reporting round. This report adds Fishing and harvesting aquatic resources because a significant pressure on lowland lakes (in particular at Llyn Glasfryn in SH44) is commercial fisheries and / or feeding ducks, as a root cause for eutrophication. The main pressure on oligotrophic lake habitats and, in particular, small heathland pools is nutrient enrichment, although this is of local occurrence in lakes (a prevalence of filamentous green algae being noted, however, in a wide range of sites) and largely managed in the pool habitats by recurrent disturbance management or control of submerged vegetation.	
<b>2.6.1 Method used – Pressures</b>	<b>mainly based on expert judgement and other data</b> Site surveys and monitoring assessments are used to identify the pressures at individual sites (eg the pressure of outdoor sports and leisure / recreation in Newbold, 2001). There is an unavoidable level of interpretation in assigning rank order (High - Medium - Low) to these pressures affecting <i>Luronium</i> over a wide range of habitats (and growth forms) and, for this reason, the methods of assessment also involve a measure of expert judgement.

2.7 Threats		
a) Threat	b) Ranking	c) Pollution qualifier

	H = high importance M = medium importance L = low importance	
G01: Outdoor sports and leisure activities, recreational activities	M	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	P
H07: Other forms of pollution	L	N

High levels of motorised boat traffic (G01) can directly suppress the growth of *Luronium* through increased water turbidity and various forms of water pollution (H01 & H07), especially phosphorus and nitrogen stimulate the growth of other competitive plant species.

<b>2.7.1 Method used – Threats</b>	<b>expert opinion</b> The threat to submerged <i>Luronium</i> from motorised boat traffic has been modelled from a wide range of data but the wider threats from (which also apply to canal populations) are directly assessed and interpreted by expert opinion. For this reason the code for expert opinion is given here.
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<b>2.8 Complementary information</b>	
<b>2.8.1 Justification of % thresholds for trends</b>	
<b>2.8.2 Other relevant information</b>	
<b>2.8.3 Trans-boundary assessment</b>	

<b>2.9 Conclusions (<i>assessment of conservation status at end of reporting period</i>)</b>
Please refer to the United Kingdom assessment for this species.

**3 Natura 2000 coverage & conservation measures - Annex II species**  
*(only applies to species listed under Annex II of the Directive)*

<b>3.1 Population</b>		
<b>3.1.1 Population size</b>	<b>a) Unit</b>	<b>number of localities</b>

Estimation of population size included in the SAC network	As for notes against 2.4.2a and 2.4.3a	
	<b>b) Minimum</b>	<b>22</b>
	As for notes against 2.4.2a & b above.	
	<b>c) Maximum</b>	<b>31</b>
As for notes against 2.4.2a & b above		
<b>3.1.2 Method used</b>	<b>Estimate based on partial data with some extrapolation and/or modelling</b>	
See note for 2.4.5, above.		
<b>3.1.3 Trend of population size within the network</b> (short-term trend)	<b>decrease</b>	
	Despite the difficulties in defining population size (notes to 3.1.1b & c, above) and the need for approximation overall, there is evidence of local declines in <i>Luronium</i> within the SAC network - specifically within the Montgomery Canal. It should be emphasised that, for the majority of sites in oligotrophic lakes and rivers, there is no sign of decline and for the heathland pool populations on Dowrog and Ramsey there even appears to be a slight increase (as seen, for instance, in the recent SM62 locality). For the majority of localities in the Montgomery Canal SAC, however, there are clear signs of decline. The direct evidence in bsbidb.org etc is incomplete (see note 2.4.5) but indirect measurements, particularly surveys of associated vegetation (eg ECUS, 2010) show a significant decline in habitat quality. <i>Luronium</i> is unlikely to be present in areas of continuous emergent vegetation and the recent spread in <i>Glyceria maxima</i> and <i>Sparganium erectum</i> swamp communities indicates a probably overall decline.	

<b>3.2 Conservation measures</b>														
Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.														
<b>3.2.1 Measure</b>	<b>3.2.2 Type</b>					<b>3.2.3 Ranking</b>  H = high importance M = medium importance L = low importance	<b>3.2.4 Location</b>  where the measure is PRIMARILY applied			<b>3.2.5 Broad evaluation of the measure</b>				
	a) Legal/statutory	b) Administrative	c) Contractual	d) Recurrent	e) One-off		a) Inside	b) Outside	c) Both inside & outside	a) Maintain	b) Enhance	c) Long term	d) No effect	e) Unknown

4.1: Restoring/im proving water quality	Y			Y		M			Y	Y	Y	Y			
4.3: Managing water abstraction	Y		Y			M	Y			Y		Y			
6.1: Establish protected areas/sites	Y					H			Y	Y	Y	Y			
6.3: Legal protection of habitats and species	Y					H			Y	Y	Y	Y			

4.1 The pools on Dowrog Common and Ramsey Island have been restored and maintained to provide additional open water; 6.1 & 6.3 the largest populations and widest range of habitats for this species are located within protected areas (almost all within the SSSI series and the majority of sites in SACs); 4.3 the populations in reservoirs (especially those in Llyn Egnant and Llyn Teifi) are protected against excess water abstraction by agreement with the water utility company.