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

Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the species:

S1013 - Geyer's whorl snail (*Vertigo geyeri*)

WALES

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this species, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this species is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; (iii) the field was not relevant to this species (section 12 Natura 2000 coverage for Annex II species) and/or (iv) the field was only relevant at UK-level (sections 9 Future prospects and 10 Conclusions).
- For technical reasons, the country-level future trends for Range, Population and Habitat for the species are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (Wales information only)**
1.2 Species code	**1013**
1.3 Species scientific name	**Vertigo geyeri**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Geyer's whorl snail

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2004-2017
2.3 Distribution map	Yes
2.4 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
2.5 Additional maps	No

3. Information related to Annex V Species (Art. 14)

3.1 Is the species taken in the wild/exploited?	No	
3.2 Which of the measures in Art. 14 have been taken?	a) regulations regarding access to property	No
	b) temporary or local prohibition of the taking of specimens in the wild and exploitation	No
	c) regulation of the periods and/or methods of taking specimens	No
	d) application of hunting and fishing rules which take account of the conservation of such populations	No
	e) establishment of a system of licences for taking specimens or of quotas	No
	f) regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens	No
	g) breeding in captivity of animal species as well as artificial propagation of plant species	No
	h) other measures	No

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3.3 Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)

a) Unit

b) Statistics/ quantity taken	Provide statistics/quantity per hunting season or per year (where season is not used) over the reporting period					
	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
Min. (raw, ie. not rounded)						
Max. (raw, ie. not rounded)						
Unknown	No	No	No	No	No	No

3.4. Hunting bag or quantity taken in the wild Method used

3.5. Additional information

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

Fowles, A.P. 2013. 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: S1013 - Geyer's Whorl Snail (Vertigo geyeri).
Killeen, I.J. & Moorkens, E. 2004. Condition monitoring of Vertigo geyeri on Cors Erddreiniog & Waun Eurad, Corsydd Mon/Anglesey Fens candidate Special Area of Conservation, Wales. CCW Contract Science No. 625. Countryside Council for Wales, Bangor.
Killeen, I.J. & Moorkens, E. 2008. Condition monitoring of Vertigo geyeri on Waun Eurad and Cors Erddreiniog SAC. CCW Environmental Monitoring Report No. 42. Countryside Council for Wales, Bangor.
Lloyd, D. 2005. The condition of Vertigo geyeri on Corsydd Llyn / Lleyn Fens SAC. CCW File note, 17 October 2005. Countryside Council for Wales, Bangor.
Lloyd, D. 2008. The condition of Vertigo geyeri on Corsydd Llyn / Lleyn Fens SAC. CCW File note, 10 October 2008. Countryside Council for Wales, Bangor.
Sharland, E. 2000. Autecology of Vertigo angustior and Vertigo geyeri in Wales. CCW Contract Science No. 392. Countryside Council for Wales, Bangor.
Sharland, E.C. 2001. Autecology of Vertigo angustior and Vertigo geyeri in Wales. Ph.D., University of Sheffield.
Lloyd, D. 2014. The condition of Vertigo geyeri on Waun Eurad 2014- Anglesey Fens SAC. NRW File note, 10 September 2014. Natural Resources Wales, Bangor.
Willing, M.J. 2012. The status and distribution of Geyer's Whorl Snail Vertigo geyeri at Craig y Cilau National Nature Reserve in 2011, with a wider search of

other sites in south-east Wales supporting base-rich seepages. CCW Contract Science No. 1018. Countryside Council for Wales, Bangor.
Willing, M.J. 2017. A survey for Geyer's Whorl Snail Vertigo geyeri on Cors Erddreiniog SSSI and Cors Geirch SSSI in 2016. NRW Evidence Report No. 209. Natural Resources Wales, Bangor.
Willing, M.J. 2018. Surveys for Desmoulin's Whorl Snail Vertigo moulinsiana on Cors Geirch NNR/SSSI and the Afon Penrhos floodplain & for Geyer's Whorl Snail Vertigo geyeri on Cors Geirch NNR in 2017. NRW Evidence Report No. 258. Natural Resources Wales, Bangor.

5. Range

5.1 Surface area (km²)		
5.2 Short-term trend Period		
5.3 Short-term trend Direction	Decreasing (-)	
5.4 Short-term trend Magnitude	a) Minimum	b) Maximum
5.5 Short-term trend Method used		
5.6 Long-term trend Period		
5.7 Long-term trend Direction		
5.8 Long-term trend Magnitude	a) Minimum	b) Maximum
5.9 Long-term trend Method used		
5.10 Favourable reference range	a) Area (km²) b) Operator c) Unknown d) Method	
5.11 Change and reason for change in surface area of range	Genuine change The change is mainly due to:	Genuine change
5.12 Additional information		

6. Population

6.1 Year or period	2004-2017	
6.2 Population size (in reporting unit)	a) Unit	number of map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	5
6.3 Type of estimate	Best estimate	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value	
6.5 Type of estimate		

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6.6 Population size Method used	Based mainly on extrapolation from a limited amount of data
6.7 Short-term trend Period	2004-2017
6.8 Short-term trend Direction	Decreasing (-)
6.9 Short-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval
6.10 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data
6.11 Long-term trend Period	1985-2017
6.12 Long-term trend Direction	Decreasing (-)
6.13 Long-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval
6.14 Long-term trend Method used	Based mainly on extrapolation from a limited amount of data
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size b) Operator c) Unknown d) Method
6.16 Change and reason for change in population size	Genuine change The change is mainly due to: Genuine change
6.17 Additional information	

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (to maintain the species at FCS)?	No
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	No
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on extrapolation from a limited amount of data	
7.3 Short-term trend Period	2004-2017	
7.4 Short-term trend Direction	Decreasing (-)	
7.5 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data	
7.6 Long-term trend Period		
7.7 Long-term trend Direction		
7.8 Long-term trend Method used		
7.9 Additional information		

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking

Intensive grazing or overgrazing by livestock (A09)	H
Extensive grazing or undergrazing by livestock (A10)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H
Accumulation of organic material (L03)	H

Threat	Ranking
Intensive grazing or overgrazing by livestock (A09)	H
Extensive grazing or undergrazing by livestock (A10)	H
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	H
Accumulation of organic material (L03)	H
Natural processes of eutrophication or acidification (L04)	M
Abstraction from groundwater, surface water or mixed water (K01)	M
Drainage (K02)	M
Modification of hydrological flow (K04)	H
Change of habitat location, size, and / or quality due to climate change (N05)	M

8.2 Sources of information

8.3 Additional information

9. Conservation measures

9.1 Status of measures

a) Are measures needed? Yes

b) Indicate the status of measures Measures identified and taken

9.2 Main purpose of the measures taken

Restore the habitat of the species (related to 'Habitat for the species')

9.3 Location of the measures taken

Only inside Natura 2000

9.4 Response to the measures

Medium-term results (within the next two reporting periods, 2019-2030)

9.5 List of main conservation measures

Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Stop mowing, grazing and other equivalent agricultural activities (CA06)
Management of habitats (others than agriculture and forest) to slow, stop or reverse natural processes (CL01)
Improvement of habitat of species from the directives (CS03)

9.6 Additional information

10. Future prospects

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10.1 Future prospects of parameters	a) Range b) Population c) Habitat of the species
10.2 Additional information	

11. Conclusions

11.1. Range	
11.2. Population	
11.3. Habitat for the species	
11.4. Future prospects	
11.5 Overall assessment of Conservation Status	
11.6 Overall trend in Conservation Status	
11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to: b) Overall trend in conservation status No change The change is mainly due to:
11.8 Additional information	

12. Natura 2000 (pSCIs, SCIs and SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network (on the biogeographical/marine level including all sites where the species is present)	a) Unit	number of map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	5
12.2 Type of estimate	Best estimate	
12.3 Population size inside the network Method used	Based mainly on extrapolation from a limited amount of data	
12.4 Short-term trend of population size within the network Direction	Decreasing (-)	
12.5 Short-term trend of population size within the network Method used	Based mainly on extrapolation from a limited amount of data	
12.6 Additional information		

13. Complementary information

13.1 Justification of % thresholds for trends	

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13.2 Trans-boundary assessment

13.3 Other relevant Information

Distribution Map

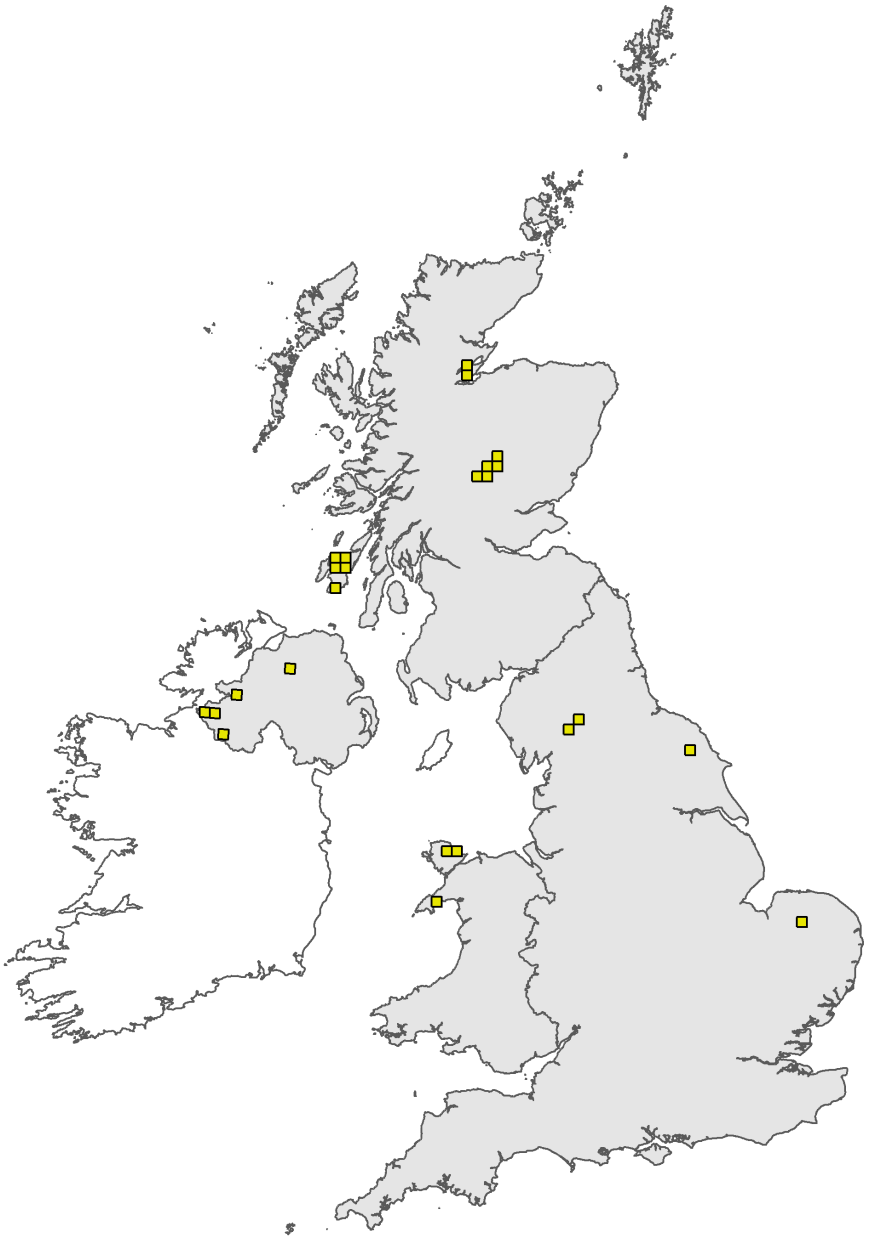

Figure 1: UK distribution map for S1013 - Geyer's whorl snail (*Vertigo geyeri*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km grid square distribution map is based on available species records within the current reporting period. For further details see the 2019 Article 17 UK Approach document.

Range Map

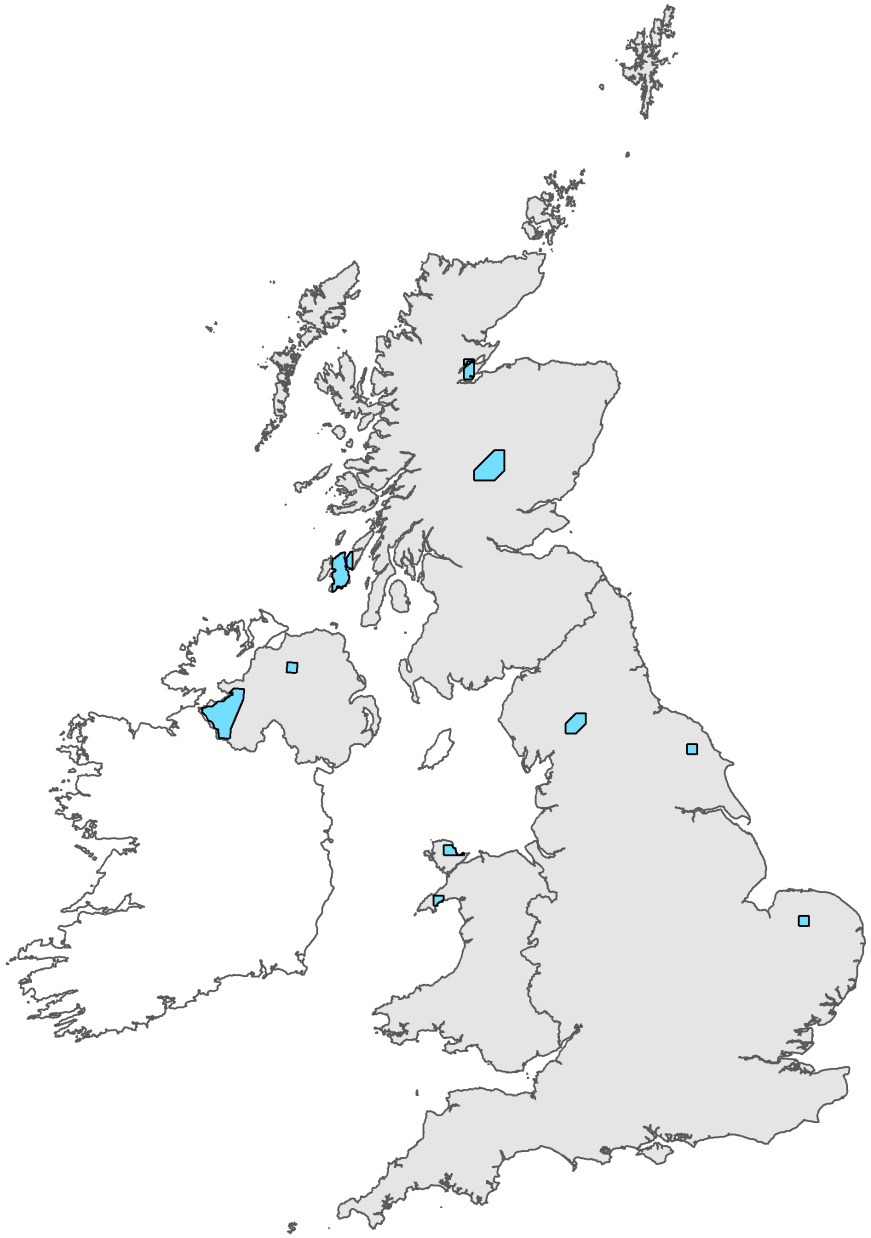

Figure 2: UK range map for S1013 - Geyer's whorl snail (*Vertigo geyeri*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this species was 20km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Species name: Vertigo geyeri (1013) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	See 5.11
5.11 Change and reason for change in surface area of range	Whilst Vertigo geyeri was recorded on Waun Eurad in 2014 and the population is likely to persist, surveys for the snail on Cors Erddreiniog and Cors Geirch in 2016 and 2017 have failed to find any specimens. Declines in numbers on Cors Erddreiniog had been reported in 2007 when it was last recorded on the site, and the snail has not been recorded on Cors Geirch since 2005 (with a possible record in 2008 having no voucher material). Whilst the snail can be overlooked, suitable habitat at both sites is scarce and declining and it is assumed for the purpose of current Article 17 reporting that it is extinct on these sites, leaving just a single population in Wales on Waun Eurad.
6.8 Short term trend; Direction	Whilst Vertigo geyeri was recorded on Waun Eurad in 2014 and the population is likely to persist, surveys for the snail on Cors Erddreiniog and Cors Geirch in 2016 and 2017 have failed to find any specimens. Declines in numbers on Cors Erddreiniog had been reported in 2007 when it was last recorded on the site, and the snail has not been recorded on Cors Geirch since 2005 (with a possible record in 2008 having no voucher material). Whilst the snail can be overlooked, suitable habitat at both sites is scarce and declining and it is assumed for the purpose of current Article 17 reporting that it is extinct on these sites, leaving just a single population in Wales on Waun Eurad.
6.9 Short term trend; Magnitude	Within the period a decline from 5 to 1, 1x1km grid squares.
6.14 Long term trend; Method used	Whilst Vertigo geyeri was recorded on Waun Eurad in 2014 and the population is likely to persist, surveys for the snail on Cors Erddreiniog and Cors Geirch in 2016 and 2017 have failed to find any specimens. Declines in numbers on Cors Erddreiniog had been reported in 2007 when it was last recorded on the site, and the snail has not been recorded on Cors Geirch since 2005 (with a possible record in 2008 having no voucher material). Whilst the snail can be overlooked, suitable habitat at both sites is scarce and declining and it is assumed for the purpose of current Article 17 reporting that it is extinct on these sites, leaving just a single population in Wales on Waun Eurad. It should be noted that population size fluctuates dramatically in Vertigo species from year to year in response to habitat changes, vegetation structure, humidity, hydrology and other factors. Coupled with episodic monitoring, it is difficult to determine if populations have been lost from sites and more regular and extensive survey work may relocate the snail on Cors Erddreiniog and Cors Geirch

7.2 Sufficiency of area and quality of occupied habitat; Method used	Lloyd (2005) mapped 4306 sq metres of potential habitat at Cors Geirch and Killeen & Moorkens (2004) mapped c. 6250 sq m. at Waun Eurad. Cors Erddreiniog has not been investigated in such detail but Killeen & Moorkens (2008) reported that compartments amounting to 11.45ha contained suitable habitat. It is likely that less than 10% of these compartments actually supports sedge lawn so there will be a maximum of 11.500 sq metres on Cors Erddreiniog that could be occupied by Vertigo geyeri (though this figure may be a substantial over-estimate). During repeat monitoring of Cors Geirch in 2008 (Lloyd 2008) no habitat was classified as being in optimal condition and only 38% of the habitat was found to be in sub-optimal condition. On Waun Eurad, Killeen & Moorkens (2008) found that the amount of suitable habitat was unchanged but there had been a slight decline in quality. It was suspected that this was due to the exceptionally wet conditions that summer, resulting in some areas losing vegetation cover, and that this natural event did not give cause for concern. In contrast, much of the habitat on Cors Erddreiniog was reported as being unsuitable due to inadequate grazing levels. Substantial areas have since been strimmed and grazed to improve quality. It is thought that size and quality of habitat has continued to deteriorate on Cors Erddreiniog and Cors Geirch to the present.
8.3 Additional information	Pressures: Vertigo geyeri is associated with short, open, calcareous seepages and flushes. These are very narrow and highly vulnerable ecotones which are very vulnerable to changes in grazing or hydrology, particularly as occupied seepages are often no more than a few square metres in area. Both overgrazing (A09) and undergrazing (A10) can cause a deterioration in habitat quality. A lack of grazing also results in natural succession and a ranker sward (L02) and a build up of litter (L03). On Welsh sites, the hydrological regime is primarily under control of NRW and hence seasonal fluctuations in rainfall pattern are the major influence on groundwater levels. Two of the three sites, however, suffer from vegetation succession as a result of insufficient grazing and manual strimming has been necessary to keep seepage fen open. Threats: As with Pressures (which are expected to continue), small seepages are vulnerable to modification of hydrological flow (K04), eutrophication (L04), drainage (K02) and water abstraction (K01). Climate change may cause increased drying out of seepages and result in habitat changes (N05).
10.2 Additional information	Whilst restricted to Waun Eurad SSSI which supports just 6250 square metres of suitable habitat, the future prospects for Vertigo geyeri in Wales are very negative. The site does have statutory protection but this has not prevented the apparent loss of the snail from its two other Welsh localities.
12.6 Additional information	The population has apparently been lost from Corsydd Llyn SAC (last recorded with certainty in 2005). On Corsydd Mon, the population is extant on Waun Eurad SSSI (last recorded in 2014) but has apparently been lost from Cors Erddreiniog SSSI (last recorded in 2008).