

**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:

S2492 - Vendace (*Coregonus albula*)

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 England** and refers only to the state of the habitat/species in **England** - 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.

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>	
0.2 Species	0.2.1 Species code	S2492
	0.2.2 Species scientific name	<i>Coregonus albula</i>
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	Vendace

1.1 Maps			
1.1.1 Distribution map		Sensitive	False



1.1.2 Method used - map	Complete survey/Complete survey or a statistically robust estimate		
	The species is native to only two sites in England, which are monitored for the species annually. Two refuge sites have been established for the two natural populations, but since these are translocations outside of the natural range these are not considered in this report.		
1.1.3 Year or period	2007-2012		
1.1.4 Additional	False		

distribution map	
1.1.5 Range map	

2.1 Biogeographical region & marine regions	ATL
2.2 Published sources	<p>"Winfield, Ian J.; Fletcher, Janice M.; James, J. Ben 2010. Rare Fish Monitoring Final Report , Centre for Ecology and Hydrology, http://nora.nerc.ac.uk/13743/1/Rare_fish_monitoring_Final_Report.pdf</p> <p>Winfield et al, 2008. Conservation of the vendace (<i>Coregonus albula</i>), the U.K.'s rarest freshwater fish. In: Tallmann, Ross F.; Howland, Kimberley L.; Rennie, Michael D.; Mills, Kenneth, (eds.) <i>Biology and management of coregonid fishes - 2008</i>. Stuttgart, E. Schweizerbart, 547-559 http://www.schweizerbart.de/publications/detail/isbn/9783510470655/Biology_and_Management_of_Coregonid_Fishes_2008</p> <p>Winfield, Ian J.; Fletcher, Janice M.; James, J. Ben. 2010. Refinement of hydroacoustic methodology for vendace population assessment and monitoring. Final Report. NERC/Centre for Ecology and Hydrology, 34pp. (CEH Report Ref. No. LA/C03598/3), 2010. Winfield et al http://nora.nerc.ac.uk/id/eprint/9474</p> <p>J. Alex; Bell, Victoria A. 2011. Predicting the potential long-term influence of climate change on vendace (<i>Coregonus albula</i>) habitat in Bassenthwaite Lake, U.K. <i>Centre for Ecology and Hydrology, Freshwater Biology</i>, 56. 395-405. http://nora.nerc.ac.uk/10797/</p> <p>Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17</p> <p>CEH (Unpublished) Monitoring the Fish Populations of Bassenthwaite Lake and Derwent Water, 2011. Report to the Environment Agency by Centre for Ecology and Hydrology.</p> <p>Winfield, Ian J.; Fletcher, Janice M.; James, J. Ben. 2009 Investigation of vendace spawning grounds in Derwent Water. Final Report. NERC/Centre for Ecology and Hydrology, 42pp. (CEH Report Ref. No: LA/C03635/3) (Unpublished) http://nora.nerc.ac.uk/id/eprint/7151</p> <p>Winfield, I.J.; Fletcher, J.M.; James, J.B. 2011 Invasive fish species in the largest lakes of Scotland, Northern Ireland, Wales and England: the collective U.K. experience. <i>Hydrobiologia</i>, 660. 93-103. 10.1007/s10750-010-0397-2</p>

	<p>Winfield, Ian J.; Fletcher, Janice M.; Lyle, Alexander A.. 2008 Assessment of the vendace refuge population of Loch Skeen. Final Report. NERC/Centre for Ecology and Hydrology (CEH Report Ref No: LA/C02539/3, Scottish Natural Heritage Commissioned Report No.281, ROAME No. R06AC601A) (Unpublished) http://nora.nerc.ac.uk/id/eprint/2181</p> <p>Winfield, Ian J.; Fletcher, Janice M.; Lyle, Alexander A.. 2007 Assessment of the vendace refuge population of Loch Skeen. Draft Final Report. Lancaster, NERC/Centre for Ecology and Hydrology, 20pp. (CEH Report Ref No: LA/C02539/2) (Unpublished)</p> <p>Lyle, A. A.; Maitland, P. S.; Winfield, I. J.. 2006 Translocation of vendace from Derwentwater to safe refuge locations (2005/6) Final Report. Centre for Ecology and Hydrology, 31pp. (CEH: Project Report Number C02852) (Unpublished)</p> <p>Maberly, S.C et al. 2011 A survey of the lakes of the English Lake District: The Lakes Tour 2010. NERC/Centre for Ecology & Hydrology, (CEH Project Number: C04357) http://nora.nerc.ac.uk/14563/2/N014563CR.pdf</p> <p>Common Standards for Monitoring assessment of Bassenthwaite Lake, 2009. (University College London for Natural England) (unpublished)</p> <p>Warburton, J. Sediment Transfer in Steep Upland Catchments (Northern England, UK): Landform and Sediment Source Coupling.2010. Landform - Structure, Evolution, Process Control Lecture Notes in Earth Sciences Volume 115, 2010, pp 165-183 http://link.springer.com/chapter/10.1007%2F978-3-540-75761-0_11?LI=true</p>
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2.3 Range	
2.3.1 Surface area Range	
2.3.2 Method used Surface area of Range	Complete survey/Complete survey or a statistically robust estimate
2.3.3 Short-term trend Period	2001-2012
2.3.4 Short term trend Trend direction	stable
	The Bassenthwaite population became extinct from its natural site by the start of the short-term trend period. As such the short-term trend in range is considered to be stable since Bassenthwaite has remain unchanged since extinction.

2.3.5 Short-term trend Magnitude	a) Minimum	
	b) Maximum	
2.3.6 Long-term trend Period	1989-2012	
2.3.7 Long-term trend Trend direction	decrease >1%/year	
	The long-term trend period includes the extinction of the population at Bassenthwaite, such that the long-term trend in range is one of considerable decline in England (with the loss of one out of only two naturally occupied sites).	
2.3.8 Long-term trend Magnitude Optional	a) Minimum	
	b) Maximum	
2.3.9 Favourable reference range	a) Value in km²	
	b) Operator for FRR	
	c) FRR is unknown (indicated by "true")	False
	d) Method used to set FRR	
2.3.10 Reason for change Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to...	a) Genuine change?	True
	The Bassenthwaite extinction had not been confirmed at the time of the last reporting round, such that a genuine loss of range in England is only now being reported.	
	b) Improved knowledge/more accurate data?	False

	c) Use of different method (e.g. "Range tool")?	False

2.4 Population		
2.4.1 Population size estimation (using individuals or agreed exceptions where possible)	a) Unit	number of individuals
	b) Minimum	242
	c) Maximum	29000
2.4.2 Population size estimation (using population unit other than individuals) Optional (<i>if 2.4.1 filled in</i>)	a) Unit	
	b) Minimum	
	c) Maximum	
2.4.3 Additional information on population estimates / conversion Optional	a) Definition of "locality"	Bassenthwaite Lake Derwent Water
	b) Method to convert data	
	c) Problems encountered to provide population size estimation	
2.4.4 Year or period	2007-2012	
2.4.5 Method used Population size	Complete survey/ Complete survey or a statistically robust estimate	
2.4.6 Short-term trend Period	2001-2012	
2.4.7 Short-term trend Trend direction	decrease 1% or less/year	
2.4.8 Short-term trend Magnitude		

	a) Minimum	
	b) Maximum	
	c) Confidence interval	
2.4.9 Short-term trend Method used	Complete survey/Complete survey or a statistically robust estimate	
2.4.10 Long-term trend – Period	1995-2012	
2.4.11 Long-term trend Trend direction	decrease >1%/year	
2.4.12 Long-term trend Magnitude Optional	a) Minimum	50
	b) Maximum	64
	c) Confidence interval	
2.4.13 Long term trend Method used	3	
2.4.14 Favourable reference population	a) Number of individuals/agreed exceptions/other units	
	b) Operator	much more than
	c) FRP is unknown indicated by	False

	"true"	
	As per the previous reporting round, considering the wide gap between minimum and maximum population estimates, it is not considered appropriate to estimate a reference population size. However, it is judged that it is much more than current.	
	d) Method used to set FRP	
2.4.15 Reason for change Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	a) Genuine change?	True
	b) Improved knowledge/more accurate data?	False
	c) Use of different method (e.g. "Range tool")?	False

2.5 Habitat for the species		
2.5.1 Area estimation	5.43	
	This is the area of Derwent Water, the only remaining occupied natural site in England since the extinction of the population at Bassenthwaite.	
2.5.2 Year or period	2012-	
2.5.3 Method used Habitat for the species	Complete survey/Complete survey or a statistically robust estimate	
2.5.4 Quality of the habitat	a) Habitat quality	Moderate
	This assessment is based on the quality of the remaining occupied natural habitat (Derwent Water), which is affected by the invasion of <i>Crassula helmsii</i> , ruffe and roach. Although the impact on the vendace population is not clear, <i>Crassula</i> spreads across the shallow sub-littoral zone where vendace spawning occurs, so there is a clear risk of impact on the species. In Bassenthwaite Lake where the species has become extinct, the habitat is affected by nutrient enrichment, the siltation of vendace spawning substrates, <i>Crassula</i> , ruffe and roach. The spawning substrates in Bassenthwaite are not of suitable quality to attempt re-introduction of the species. If the assessment included the quality of Bassenthwaite habitat, it would be assessed as Bad.	
	b) Assessment method	SAC condition assessment of Bassenthwaite and Derwent Water. Further general surveys of the Cumbrian Lake District, and specific spawning

		substrate assessments.
2.5.5 Short-term trend Period	2001-2012	
2.5.6 Short-term trend Trend direction	decrease This assessment is based on the quality of the remaining occupied natural habitat (Derwent Water), which has been colonised by <i>Crassula</i> within the short-term trend period. In Bassenthwaite Lake where the species has become extinct, habitat quality has been improving through measures to reduce nutrient enrichment and siltation.	
2.5.7 Long-term trend Period	1995-2012	
2.5.8 Long-term trend Trend direction	decrease	
2.5.9 Area of suitable habitat for the species	a) Value in km²	
	This is the area of Derwent Water, the only remaining occupied natural site in England since the extinction of the population at Bassenthwaite. Bassenthwaite Lake may become suitable once more if measures to address habitat quality issues bring about sufficient improvement - this would bring the area of suitable habitat to 1.5km ² . Other lakes in England are either known or thought to be suitable, including those being used as refuge sites for the Derwent Water and Bassenthwaite populations. However, there are no records that these sites ever supported vendace in the past and are therefore not considered to be part of the species' natural range.	
2.5.10 Reason for change Is the difference between the value reported at 2.5.1 and the previous reporting round mainly due to	a) Genuine change?	False
	b) Improved knowledge/more accurate data?	False
	c) Use of different method (e.g. "Range tool")?	True

2.6 Main pressures		
a) Pressure	b) Ranking	c) Pollution qualifier
	H = high importance	

	M = medium importance L = low importance	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	H	X
I01: invasive non-native species	H	
I02: problematic native species	H	
J02: human induced changes in hydraulic conditions	H	
C01: Mining and quarrying	M	
F02: Fishing and harvesting aquatic resources	M	
M01: Changes in abiotic conditions	L	

C01/H01 - Pollution sources include nutrients from domestic sources, nutrients and fine sediment from agriculture, and a mixture of pollutants from mining.

F02 - Angling is responsible for the introduction of ruffe and roach (as livebait) into vendace sites (see I02 below).

I01 - *Crassula* has invaded both Derwent Water and Bassenthwaite Lake and has spread across much of the sub-littoral zone where vendace spawn. Problems may be more acute in Bassenthwaite Lake where suitable spawning substrates are more infrequent and where other pressures (such as siltation) have a stronger effect in combination.

I02 - Ruffe and roach have been accidentally introduced into both English sites. Ruffe in particular is known to predate whitefish eggs and can have a considerable effect on whitefish populations.

J02 - Enhanced fine sediment loads largely originate from historical river channel engineering works upstream of Derwent Water and Bassenthwaite Lake. Channel straightening and oversizing increase reduce fine sediment deposition on the floodplain and in backwaters and therefore increase conveyance to the downstream lakes.

M01 - Climate change is creating temperature rises that are likely to be affecting this coldwater species.

2.6.1 Method used – Pressures	mainly based on expert judgement and other data
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2.7 Threats		
a) Threat	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	H	X
I01: invasive non-native species	H	
I02: problematic native species	H	
J02: human induced changes in hydraulic conditions	H	
C01: Mining and quarrying	M	

M01: Changes in abiotic conditions	L	

Most of the pressures in 2.6 are set to continue into the future. Many of the pressures/threats listed are being acted on through specific conservation measures which need to be continued and strengthened - however, there are currently no viable methods available to control Crassula or ruffe (see also notes on 2.9).

2.7.1 Method used – Threats	expert opinion

2.8 Complementary information

2.8.1 Justification of % thresholds for trends	

2.8.2 Other relevant information	

2.8.3 Trans-boundary assessment	

2.9 Conclusions (*assessment of conservation status at end of reporting period*)

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*)

3.1 Population

3.1.1 Population size	a) Unit	
	b) Minimum	
3.1.2 Method used		

Estimation of population size included in the SAC network

3.1.3 Trend of population size within the network (short-term trend)	

3.2 Conservation measures

Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.

3.2.1 Measure	3.2.2 Type					3.2.3 Ranking H = high importance M = medium importance L = low importance	3.2.4 Location where the measure is PRIMARILY applied			3.2.5 Broad evaluation of the measure					
	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	f) Not evaluated

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