

**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:

S1441 - Shore dock (*Rumex rupestris*)

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>	
0.2 Species	0.2.1 Species code	S1441
	0.2.2 Species scientific name	<i>Rumex rupestris</i>
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	Shore dock

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 There is good survey data on the recent and current distribution of this species by local botanists and Country Agency staff monitoring SAC features. The potential habitat for this species is widely distributed around the Welsh coast and small populations of Shore dock could readily be overlooked. Despite this, there has been considerable effort put into searching suitable sites in north and south Wales in recent years and the current 10 km sq distribution is considered likely to be near complete.
1.1.3 Year or period	2007-2012

	There are continuous records from all sites since 2007.
1.1.4 Additional distribution map	False
1.1.5 Range map	

2.1 Biogeographical region & marine regions	ATL
2.2 Published sources	<p>"Bonner, I.R. (2007) Anglesey Rare Plant Register (revised edition). Botanical Society of the British Isles.</p> <p>Bsbiddb.org</p> <p>Creer, J. (2005) Abermenai - Aberffraw SAC. R. rupestris monitoring. (Countryside Council for Wales. Bangor.)</p> <p>Creer, J. (2012) in prep. Abermenai - Aberffraw SAC. R. rupestris monitoring. (Countryside Council for Wales. Bangor.)</p> <p>Evans, S.B. (2001) Rumex rupestris survey work in Pembrokeshire 2001. A brief report by S.B.Evans. (Unpublished report to Countryside Council for Wales. B.S.B.I.)</p> <p>Evans, S.B. (2012) Rumex rupestris survey work in Pembrokeshire 2011. A brief report by S.B.Evans. (Unpublished report to Countryside Council for Wales. B.S.B.I.)</p> <p>Jones, R.A. (1993) Shore dock (<i>Rumex rupestris</i>). Monitoring report. Countryside Council for Wales.</p> <p>Kay, Q.O.N. Draft Biological Flora of the British Isles: <i>Rumex rupestris</i> Le Gall. (Unpublished report submitted to the <i>Rumex rupestris</i> UKBAP Steering Group).</p> <p>McDonnell, E.J. & King, M.P. (2006) <i>Rumex rupestris</i> Le Gall (Shore Dock) in SW England: review of recent surveys and assessment of current status. (In: Leach, S.J., Page, C.N. Peytoureau, Y. & Sandford, M.N. eds. Botanical Links in the Atlantic Arc, pp. 201-209. BSBI, London.)</p> <p>Wilkinson, K. (2008) Dunraven Bay SAC. <i>Rumex rupestris</i> (1441) SAC Monitoring report Draft. (Unpublished report to Countryside Council for Wales)."</p>

2.3 Range

2.3.1 Surface area

Range		
2.3.2 Method used	Complete survey/ Complete survey or a statistically robust estimate	
Surface area of Range	There is good survey data on the recent and current distribution of this species by local botanists and Country Agency staff monitoring SAC features. The potential habitat for this species is widely distributed around the Welsh coast and small populations of Shore dock could readily be overlooked. Despite this, there has been considerable effort put into searching suitable sites in north and south Wales in recent years and the current 10 km sq distribution is considered likely to be near complete.	
2.3.3 Short-term trend		
Period	The 2001-2012 date-class provides the best information on range trend for <i>Rumex rupestris</i> in Wales.	
2.3.4 Short term trend		
Trend direction	The current 10 km sq range has fluctuated over the 2001-2012 period with the loss of <i>Rumex rupestris</i> from SH46, Newborough, Y Twyni o Abermenai I Aberffraw SAC and its reappearance following pond excavation. The overall trend therefore appears static (although this is artificially maintained by hand-clearance of associated vegetation and the population here would otherwise disappear).	
2.3.5 Short-term trend		
Magnitude	a) Minimum	
	The 10 km sq range in Wales has remained static.	
	b) Maximum	
	See note 2.3.5a	
2.3.6 Long-term trend		
Period	There is an apparent increase in range over the 24 year period with the discovery of new colonies of Shore dock in SM70 and the rediscovery (after an apparent loss) in SS87. This does not represent any actual range expansion, however, as neither population is newly established and the additional records are simply the result of improved survey.	
2.3.7 Long-term trend		
Trend direction	The long term trend in 10 km sq range is static.	
2.3.8 Long-term trend		
Magnitude	a) Minimum	
Optional	See note 2.3.6 above. Despite the discovery of new colonies during the period 1989-2012 there has been no overall change in the underlying distribution.	
	b) Maximum	
	See note 2.3.8a above.	
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?	False
	The 10 km sq distribution has remained stable since the last reporting round. The slight change in the mapped distribution reflects better mobilisation of records rather than any underlying change in the species distribution.	
	b) Improved knowledge/more accurate data?	True
	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
	Individual plants (both flowering and non-flowering) have been counted at all sites. Possible shore dock seedlings have been identified at one site (Pembrokeshire Coast) but are not included in the maximum total population. At the same time, it is worth noting that plants vary considerably in size (number of flowering / fruiting stems) and in seed output. A small number of individuals may represent a very large fruiting population ... and vice versa. There is a large margin of error in these population counts.	
	b) Minimum	298
	The latest data show 76 mature plants in Pembrokeshire (2011), 2 plants in Glamorgan (2011) and 220 plants in Anglesey (2012).	
	c) Maximum	298
	10 seedlings (possibly <i>R. rupestris</i>) were noted in the 2011 count for Pembrokeshire, but the total is the same as for adult plants (see note 2.4.1a above).	
2.4.2 Population size	a) Unit	

estimation (using population unit other than individuals) Optional (<i>if 2.4.1 filled in</i>)	b) Minimum	
	c) Maximum	
2.4.3 Additional information on population estimates / conversion Optional	a) Definition of "locality"	
	b) Method to convert data	
	c) Problems encountered to provide population size estimation	
2.4.4 Year or period	2008-2011	
	2008-2011 is the reporting period since there has been a comprehensive monitoring surveillance exercise on all sites during this time.	
2.4.5 Method used Population size	Complete survey/ Complete survey or a statistically robust estimate	
	All sites for Shore dock have been surveyed and individual plants counted (with additional data on size-class & flowering / non-flowering status, presence of candidate hybrid plants).	
2.4.6 Short-term trend Period	2001-2012	
	Data from the period 2001-2012 is available for two sites (Pembrokeshire Marine SAC and Y Twyni Abermenai I Aberffraw SAC) and from 2003 for Dunraven Bay SAC.	
2.4.7 Short-term trend Trend direction	increase	
	There has been a decline at Dunraven Bay SAC due to rockfall and fluctuations at Newborough, Y Twyni Abermenai I Aberffraw SAC due to generally unfavourable habitat conditions associated with forestry and artificial recovery.	
2.4.8 Short-term trend Magnitude	a) Minimum	51
	Populations clearly fluctuate greatly and trends between the latest and earliest (post 2001) counts may conceal other patterns. The first post-2001 counts for Anglesey, for instance, show c.100 plants but these were artificially restored from a much lower population size and, as all plants of shore dock, vary greatly in size and seed-output. The total number of plants at Dunraven fluctuated in this period between 14, 10 and 18 just prior to the rockfall when they declined to 9 and then subsequently 4 plants. The Pembrokeshire counts appear stable (around 70 plants) but this actually conceals a major fluctuation, where a significant cliff-base colony was extirpated by rockfall but, shortly afterwards, a further colony increased in size and a new subsite either germinated or was discovered by more careful searching. Overall, a	

	baseline would be 198 plants at the start of counting and 300 at the most recent counts (or 310 if seedlings were included). Trends in individual plants can conceal other, potentially more significant patterns - such as annual seed output, historical seed-bank longevity and temporary management effects.	
	b) Maximum	56
	See note 2.4.8a above (especially summary counts).	
	c) Confidence interval	
	The fluctuations in numbers and difficulties attempting to quantify effective population size (such as the role of seed dormancy and relative seed output) suggest that it might be very complicated to attempt a meaningful statistical treatment of these results.	
2.4.9 Short-term trend Method used	Complete survey/Complete survey or a statistically robust estimate	
	All sites for Shore dock have been surveyed and individual plants counted (with additional data on size-class & flowering / non-flowering status, presence of candidate hybrid plants).	
2.4.10 Long-term trend – Period	1989-2012	
	There is only partial data available for the long-term trend, based on unsystematic data collection at Newborough prior to c.1998, the rediscovery of plants at Dunraven Bay in 1996 and their discovery at Marloes, Pembrokeshire in 2000. The Newborough population appears to have increased since the early 1990's but this conceals major fluctuations, mediated by management. There is no longer term data than post 2001 (see 2.4.8 above) for for the Dunraven Bay and Pembrokeshire Coast populations and so the same qualifications apply.	
2.4.11 Long-term trend Trend direction	unknown	
	See note 2.4.10	
2.4.12 Long-term trend Magnitude	a) Minimum	
Optional	See note 2.4.10	
	b) Maximum	
	See note 2.4.10	
	c) Confidence interval	

2.4.13 Long term trend Method used	0 Only partial data (Jones, 1993) is available for pre-2001 abundance and nothing is known of trends at Dunraven Bay and Pembroke Coast SAC populations prior to c.2003.	
2.4.14 Favourable reference population	a) Number of individuals/agreed exceptions/other units	
	b) Operator	
	c) FRP is unknown indicated by "true"	False
	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?
There has been a significant decline in the very small populations at Dunraven Bay SAC, due to a rockfall in 2005 but Shore dock has increased in parts of Twyni Abermenai I Aberffraw SAC through artificial site management. The Pembrokeshire Coast populations appear to have fluctuated very significantly in the short term.		
b) Improved knowledge/more accurate data?		True
There is continually improving data on Shore dock through accumulating surveillance monitoring and, in the long term trend period, previously undetected populations of this species have been discovered (or rediscovered).		
	c) Use of different method (e.g. "Range tool")?	False

2.5 Habitat for the species	
2.5.1 Area estimation	0.01 Shore dock is confined to very narrow zone of available habitat (low-nutrient damp seepages and stream banks) and its area of current occupancy is calculated to be no more than 100 m sq (allowing a 2m width area of habitat on stream banks and around each area of flushed cliff / upper shore).

	There is not thought to be a sufficient amount of habitat in the UK to support a viable population of the species.	
2.5.2 Year or period	2007-2012	
	There is good spatial survey data on the shore dock habitat between 2007 and 2012	
2.5.3 Method used Habitat for the species	Estimate based on partial data with some extrapolation and/or modelling	
	Calculations of habitat surface area are based on surveys of occupied streambank and flushed cliff / upper beach area. The boundaries of this area of effective habitat, however, are estimates (2m channel width / perimeter) and do not accommodate hydrological catchment or zones of mobile sand replenishment. For this reason they are estimated areas of occupied habitat.	
2.5.4 Quality of the habitat	a) Habitat quality	Bad
	Despite the approximations in measurement of effective habitat area (note to 2.5.3 above) it is clear that rockfalls (at Dunraven Bay) and, most significantly, forestry at Newborough significantly detract from the habitat quality of shore dock in Wales. The habitat for Shore dock at Newborough (Twyni Abermenai I Aberffraw SAC) and surrounding catchment has been planted with alien conifer species (<i>Pinus nigra</i> / <i>P. contorta</i>), preventing the regeneration of early successional habitat (dune mobility), increasing the nutrient status of soils through leaf-deposition, creating habitat for more shade-tolerant dock species (<i>R. conglomeratus</i>) with an increased risk of hybridisation and altering the hydrology of the site. A natural rock-fall at Dunraven Bay SAC in 2005 has greatly reduced the extent of tufaceous rock (and its colony of Shore dock) and regeneration of this specialised habitat is expected to take several decades	
	b) Assessment method	The habitat at all sites for Shore dock has been directly assessed by staff from the Countryside Council for Wales and voluntary assistance from regional experts in the Botanical Society of the British Isles. The surveillance / monitoring techniques are standardised and allow compilation of data and comparison of results.
	The habitat for shore dock has been assessed on visible evidence (area of tufaceous rock at Dunraven Bay before and after rockfall; low-nutrient, early successional habitat at Newborough) and autecological studies on the species throughout its range (McDonnell & King, 2006; Kay, 2002).	
2.5.5 Short-term trend Period	2001-2012	
	There is good data from the 2001-2012 time period, since this includes the both the dates of discovery of Shore dock in west Pembrokeshire and its rediscovery in Glamorgan (Dunraven Bay SAC).	
2.5.6 Short-term trend Trend direction	decrease	
	There have been significant fluctuations in the extent of suitable habitat for Shore dock at Newborough, Glannau Mon SAC and from the small population at Dunraven Bay. Despite clearance of the stream-banks at Newborough, pond excavation and limited tree-clearance the general outlook for this species' habitat in Twyni Abermenai I Aberffraw has	

	been poor, as non-native conifer plantations become more established and the dynamic aspects of early successional areas constrained. The cliff fall at Dunraven Bay removed the majority of suitable tufaceous rock habitat.	
2.5.7 Long-term trend Period	1989-2012	
	There is partial information available on shore dock in SH36 and SH46 (Twyni Abermenai I Aberffraw SAC) from 1989 onwards, becoming more frequent and detailed after c.1991. Data on the Dunraven and Pembrokeshire populations is only available after 1996 in the first instance and 2000 in the second case, when these two populations were discovered - or rediscovered.	
2.5.8 Long-term trend Trend direction	decrease	
	The increasingly established conifer plantation represents a downward trend in wider shore dock habitat at Newborough, despite very local management. There are no signs of natural destabilisation and new records for woodland dock species (<i>R. conglomeratus</i>), increasing the risk of hybridisation. At Dunraven Bay there has been a major loss of tufa habitat and the Pembroke Coast habitat appears unstable (possibly favourable but unclear in terms of the stochastic behaviour of shore dock).	
2.5.9 Area of suitable habitat for the species	a) Value in km²	0.2
	The extent of suitable low-nutrient, early-successional dune / shingle habitat with fresh water or flushed coastal cliffs is naturally very limited in Wales. In north Wales the effective habitat for shore dock is effectively reduced to the current area of occupancy by fully surrounding forestry (with no access to potential habitat elsewhere). Shore dock appears to function as metapopulations and periodic dispersal and redistribution into newly-created or temporarily unoccupied habitat is a necessary requirement. The exact area of available habitat is unclear (and limited by restricted seed output amongst other things) but, in the absence of extensive mobile dunes and widespread early successional dune slack in Wales, is unlikely to exceed twenty times the area of current occupancy. For these reasons it is estimated at 0.2 km sq.	
	b) Absence of data indicated as '0'	
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?	True
	There were no data on occupied shore dock habitat (or estimates for available habitat) in the previous reporting round, so these figures do not directly represent change. Against this earlier lack of data, however, the current information on decline and / or restricted dispersal can be used as evidence of genuine ongoing change.	
	b) Improved knowledge/more accurate data?	True
	See previous note 2.5.10a. There is a greater understanding of the ecological requirements for shore dock, especially in terms of its metapopulation behaviour and need for dispersal between dynamic, early successional habitats. So the previous assessment is strongly based on improved knowledge and more accurate data.	

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

2.6 Main pressures		
a) Pressure	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
B01: forest planting on open ground	H	
B02: Forest and Plantation management & use	H	
L05: collapse of terrain, landslide	H	
A04: grazing	L	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	NP
H02: Pollution to groundwater (point sources and diffuse sources)	L	NP
J02: human induced changes in hydraulic conditions	L	
J03: Other ecosystem modifications	L	
K01: abiotic (slow) natural processes	L	
K02: Biocenotic evolution, succession	L	
L07: storm, cyclone	L	
M01: Changes in abiotic conditions	L	

There is a risk to the early-successional habitat for shore dock from agricultural inputs H01 & H02 (perhaps most significantly in the Dunraven and Pembrokeshire catchments) although these are seen as relatively low risk - along with slow changes in abiotic conditions (K01 & M01), such as alterations to groundwater and natural succession (see also risk K02). The risk of human induced changes to site hydrology, J02, is also perceived to be low (perhaps most significantly as a side-effect of forestry at Newborough) but the direct effects of Forest and Plantation management, B02, represents a Highly Significant and increasing pressure on habitat. The presence of non-native conifers at Newborough (Glannau Mon SAC) prevent the regeneration of early successional habitat (dune mobility), increase the nutrient status of soils through leaf-deposition, create habitat for more shade-tolerant dock species (*R. conglomeratus*) with an increased risk of hybridisation and lower the water table. All these are a high pressure on the habitat. A natural rock-fall at Dunraven Bay SAC in 2005 has greatly reduced the extent of tufaceous rock and rockfalls appear to have affected some of the Pembrokeshire colony in 2008 - although this might have also led indirectly to a partial recovery elsewhere. The role of landslips L05 and storms L07 is uncertain and could very probably be necessary for regeneration in large, stochastically sound populations but they are given as a high pressure here on the basis of local evidence.

2.6.1 Method used – based exclusively or to a larger extent on real data from

Pressures	sites/occurrences or other data sources
	There are regular and detailed monitoring reports on all populations of shore dock in Wales (and infrequent assessments of suitable habitat here), providing data on habitat condition and associated factors. Staff from the Countryside Council for Wales and specialists from the Botanical Society of the British Isles have all assessed the condition of existing populations and their habitat over a period of several years. Additionally, published information on the ecology and performance of Shore dock elsewhere in its range has been used to assess Welsh populations.

2.7 Threats		
a) Threat	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
B01: forest planting on open ground	H	
B02: Forest and Plantation management & use	H	
J03: Other ecosystem modifications	H	
A04: grazing	M	
J02: human induced changes in hydraulic conditions	M	
L05: collapse of terrain, landslide	M	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	
H02: Pollution to groundwater (point sources and diffuse sources)	L	
K01: abiotic (slow) natural processes	L	
K02: Biocenotic evolution, succession	L	
L07: storm, cyclone	L	
M01: Changes in abiotic conditions	L	

The main threat to all populations is wider ecosystem modifications (J03), including fragmentation of habitat, especially in early-successional dune slacks, disrupting dispersal and genetic exchange. A major cause of this habitat fragmentation is lack of grazing (A04) on major dune, leading to over-stabilisation and insufficient range for metapopulation dynamics. Despite some tree removal to reduce shade, the other major threat (at Newborough) is forestry (B01), which has effectively isolated the dune stream population, reduced water flow, halted remobilisation and introduced shade, nutrients and other (woodland) docks into the habitat, with the threat of hybridisation. The threat from rockfalls (L03) is periodic and might actually be a source of cyclic habitat renewal on coastal sites, if populations are sufficiently large (and almost certainly larger than at present) to avoid stochastic events.

2.7.1 Method used – Threats**expert opinion**

These threats have been evaluated on the basis of expert opinion, informed by detailed autecological work and independent habitat assessment.

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**

Estimation of population size included in the SAC network

a) Unit**number of individuals**

Counts of 'individuals' usually omits (unidentifiable) seedlings and seeds - both dormant in the vicinity and on the plant. This omission could be a significant source of error in determining population trends.

b) Minimum**298**

The apparent trend in population size is c.52% increase in mature plants on first records after 2001 but see note 3.1.1a above and also note significant annual variability and the artificially-induced increase in numbers through management at Newborough, Anglesey (although

	habitat condition was generally poor at this site).		
	<table border="1"> <tr> <td>c) Maximum</td> <td>308</td> </tr> </table>	c) Maximum	308
c) Maximum	308		
	The maximum total increase would be c.56% (including probable <i>R. rupestris</i> seedlings) but see note 3.1.1b above.		
3.1.2 Method used	<p>Complete survey/Complete survey or a statistically robust estimate</p> <p>All sites for Shore dock have been surveyed and individual plants counted (with additional data on size-class & flowering / non-flowering status, presence of candidate hybrid plants). The habitat for shore dock has been assessed on visible evidence (area of tufaceous rock at Dunraven Bay before and after rockfall; low-nutrient, early successional habitat at Newborough) and autecological studies on the species throughout its range (McDonnell & King, 2006; Kay, 2002).</p>		
3.1.3 Trend of population size within the network (short-term trend)	<p>increase</p> <p>The trend of population size within the SAC network is upwards during the reporting period but it is very important to recognise the limitations of this type of abundance measurement and the context of this increment entirely resulting from short-term artificial management at one site. The pattern elsewhere shows instability and / or decline and the local increase is not indicative of good habitat conditions.</p>		

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
1.2: Measures needed, but not implemented				Y		H	Y				Y			

3.2: Adapt forest management				Y		M		Y			Y				
4.4: Restoring coastal areas				Y		M		Y			Y	Y			
6.3: Legal protection of habitats and species	Y	Y				M		Y			Y				

A widespread programme of plantation clearance and dune destabilisation (new measures 1.2) is required at Twyni Abermenai I Aberffraw SAC to restore the population of shore dock here to viability. Dune destabilisation is required in the wider context of Kenfig SAC, which previously supported large populations of shore dock and very probably acted as a metapopulation reservoir. The conservation status of shore dock in Wales is likely to remain unfavourable so long as widespread early-successional wet dune habitats are so restricted. The existing adaptations to forest management (3.2 & 4.4) at Newborough provide a temporary, short-term conservation measure and legal protection of sites (6.3) has been effective throughout this reporting period.