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

Second Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2001 to December 2006

Conservation status assessment for :

S1441: *Rumex rupestris* - Shore dock

S1441 *Rumex rupestris* Shore dock

Audit trail compiled and edited by JNCC and the Plant Conservation Working Group

This document is an audit of the data and judgements on conservation status in the UK's report on the implementation of the Habitats Directive (January 2001 to December 2006) for this species. Superscript numbers accompanying the headings below, cross-reference to headings in the corresponding Annex B reporting form. This supporting information should be read in conjunction with the UK approach for species (see 'Assessing Conservation Status: UK Approach').

1. Range Information[2.3]

Rumex rupestris is a maritime plant found in Anglesey, south Wales, south Devon, Cornwall and the Isles of Scilly.

1.1 Surface area of range[2.3.1]

1,713km^2

The above estimate was calculated within Alpha Hull software, using extent of occurrence as a proxy measure for range (Map 1.1). The range area was clipped to include terrestrial habitat only; alpha was set at 20 km (that is, points more than 20 km apart were represented as separate areas).

Map 1.1. Current extent of occurrence and occupied 10-km squares (1999-2006)

Data sources provided in Section 6
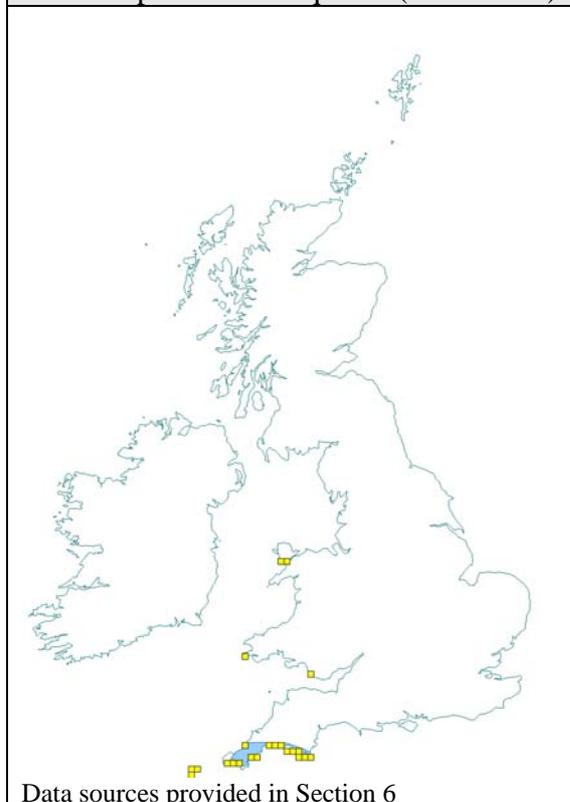
1.2 Date of range determination[2.3.2]
1999 – 2006
This date class provides the best estimate of current range.

1.3 Quality of range data[2.3.3]
Good
Distribution data have been gathered during comprehensive survey and monitoring of this species.

1.4 Range trend[2.3.4] & Range trend magnitude[2.3.5]
-4%
Map 1.2 shows records from 1980 to 1998. From this, extent of occurrence has been calculated at 1,785 km^2 (using Alpha Hull software, and applying an alpha value of 20 km); this is considered illustrative of the range when the Directive came into force. A comparison of this, and the current extent of occurrence (1,713 km^2), suggests a decline of 4% since 1980. However, this decline is not notable; the nature of sites for this species means that there is always a risk of the population being washed away or otherwise destroyed, and hence a turnover of sites with a considerable number extinct at any time is to be anticipated.

Given this situation, the absolute range covered by the species has undergone very slight change. However, within the range, area of available habitat may have declined.

Map 1.2. Historic extent of occurrence and occupied 10-km squares (1980-1998)

Data sources provided in Section 6
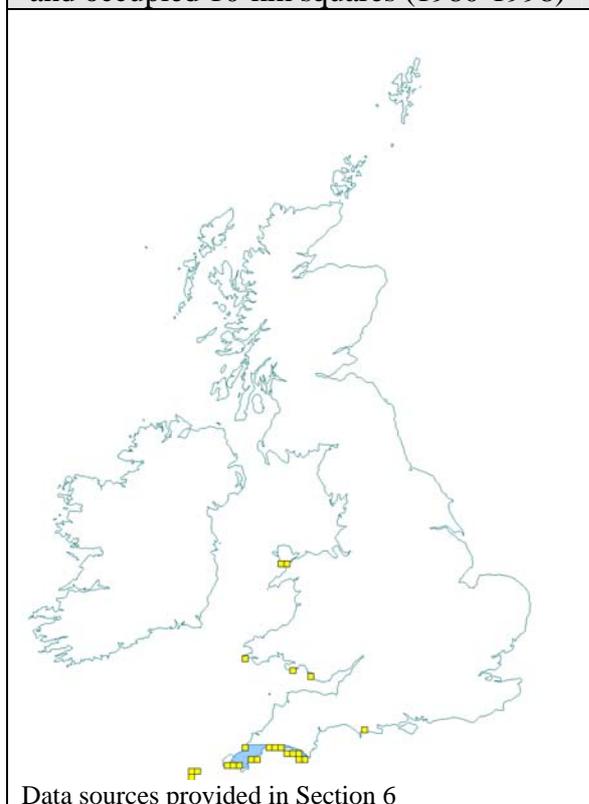
1.5 Range trend period [2.3.6]
1980 – 2006

The earlier date class (1980-1998) provides the best estimate of the range extent when the Directive came into force in 1994. The current date class represents the most recent monitoring.

1.6 Reasons for reported trend in range[2.3.7]

5 = Natural processes

The nature of sites used by this species means that there is always a risk of the population being washed away or otherwise destroyed, and hence a turnover of sites with a considerable number extinct at any time is to be anticipated.

1.7 Favourable reference range[2.7.1]

1,713km^2 (Equal to current)

The decision tree in Note 1 has been used as a guide in determining the favourable reference range estimate (see 'Assessing Conservation Status: UK Approach').

The range has not suffered a notable decline since the Habitats Directive came into force (the slight loss since the 1990s has been attributed to natural fluctuation). Although range is restricted, it is not considered to be at high risk from stochastic events. Further, the species has persisted within this restricted range for at least years. For these reasons, the favourable reference range has been identified as equal to current.

1.8 Range Conclusion[2.8]

Favourable

The current range of *R. rupestris* is stable and is equal to the favourable reference range. Therefore, in accordance with Annex C, the range is reported as Favourable.

2. Population of the species[2.4]

2.1 Population estimate[2.4.1]

220 – 250 plants

Most (but not all) sites were surveyed in 2005, giving a total population for the UK of 222 plants (Plantlife database).

2.2 Date of population estimate[2.4.2]

2005

2.3 Method of population estimate[2.4.3]

2 = extrapolation from surveys of part of the population, sampling

During 2005 not all of the populations were monitored, therefore the final population estimate represents an extrapolation.

2.4 Quality of population data[2.4.4]

Moderate

Given that not all populations were monitored in 2005, the data quality is reported as moderate.

2.5 Population trend[2.4.5] & Population trend magnitude[2.4.6]

− 46%

1999/2001 population estimates stand at 407 plants, meaning there has been a 46% decline over the last six years. However, it should be noted that the majority of this decline is due to loss of plants from a single, and formerly very large, population on the north Cornish coast (Penhale).

It could be argued that 2005 may have been a 'bad' year, but these data suggest that there are at least 19 stable sites, four increasing sites and possibly 11 'declining' sites (although some of these 'apparent declines' may be due to recording/reporting differences between 2005 and earlier population counts, and/or the loss of single plants from sites which only ever seem to support a very small number of plants). In addition, there are six sites lacking long term information.

2.6 Population trend period[2.4.7]

1999 – 2005

These are the dates during which population estimates have been undertaken by Plantlife, therefore providing a logical time frame in which to assess population trend.

2.7 Reasons for reported trend in population[2.4.8]

3. Direct human influence
5. Natural processes

Natural erosion and trampling by walkers are thought to have caused population declines.

2.8 Justification of % thresholds for trends[2.4.9]

Not applicable

2.9 Main pressures[2.4.10]

622 Walking, horse-riding and non-motorised vehicles - visitor pressures and trampling
900 Erosion – coastal erosion

2.10 Threats[2.4.11]

622 Walking, horse-riding and non-motorised vehicles - visitor pressures and trampling
701 Water pollution
954 Invasion by a species
900 Erosion
990 Other natural processes

Marine and Freshwater pollution: Populations located along the upper tide limit of south-facing beaches are particularly vulnerable to oil spillages and other sources of marine pollution. It has been suggested that a single major pollution incident could threaten several of the existing populations in the southwest of England. Sewage or fertilizer run-off in fresh water systems may also increase competition from vigorous species with possibly damaging consequences.

Invasion by a species: The Hottentot fig (*Carpobrotus edulis*) is an invasive succulent plant introduced from South Africa, and has been identified as a potential threat to certain *R. rupestris* sites.

Erosion: Particularly if storms should become more frequent and/or more severe, pressures of erosion on existing populations will increase.

Small population effects: Current populations are small and relatively isolated. Small populations have an increased risk of elimination by stochastic events, but they may also be susceptible to inbreeding depression, genetic erosion and less able to maintain distinctiveness if hybridisation with related species occurs. Furthermore, both herbivores and infestations of dock pathogens are more likely to have a catastrophic impact on small populations.

2.11 Favourable reference population[2.7.2]
200 – 500 plants
The decision tree in Note 1 has been used as a guide in determining the favourable reference population estimate (see 'Assessing Conservation Status: UK Approach.').

The post-1994 trend is decreasing. However, the evidence suggests that this is attributable to natural fluctuations. The species persists at low abundance, but is at low risk from stochastic events (more than 5 sites), and has persisted at this abundance for at least 15 years prior to 1994. Therefore it is appropriate to use an estimate of the 1994 population as the favourable reference value.

Under IUCN criteria, for the species to be outside of the threat threshold there would need to be 1000+ plants on average. One could argue that this should represent the favourable reference population. However there is nothing to indicate that historic population levels were actually any higher, or more 'secure', than those occurring today. In order to account for natural fluctuations, the favourable reference population has been set to include a range of values which include the 1994 value.

2.12 Population Conclusion[2.8]
Favourable
Although there has been a large decline (greater than 1% per year) over the last six years, this is largely attributed to natural fluctuation.

Our knowledge of population sizes, structure and mobility is still in its infancy; many populations, and even meta-populations, have only been under surveillance for 10-15 years. However, we do know that this species tends to occur in very small, and often relatively isolated, populations on dynamic coastlines, and usually within highly restricted patches of suitable habitat. As such, the loss of even just one plant on a site could be seen as a 'significant decline', even though this may be only temporary and due to natural events like winter storm-scour, burial beneath drift litter/seaweed or cliff landslips.

It is suggested that the current population estimate is just within the range that is considered acceptable for the favourable reference population. The trend is declining, both in total number of plants and possibly in the number of sites with stable or increasing populations. However, since this is known to be a dynamic species, and the decline is mostly at one site, it was considered that Favourable was a more appropriate assessment. If the decline in numbers continues over a longer time period then this assessment will need to be reviewed.

3. Habitat for the species in the Biogeographic region or sea[2.5]

R. rupestris occurs in a small number of closely related coastal habitats, and only rarely now in dune slacks. Fundamentally, it occurs within a relatively narrow zone above High Water Mark, in the presence of fresh-water, often where dynamic processes of coastal erosion constantly create new bare ground. It is able to withstand considerable salt deposition from sea spray and may be able to survive short periods of inundation during winter storms.

Principal habitats are:
- The junction between head deposits (or more rarely raised beaches) and underlying bedrock (usually slates) where spring-lines form.
- On damp cliff ledges, in seepage zones at or near the base of cliffs, or in small pools on wave cut platforms.
- In rock crevices, or between beach boulders, but only where there is a submerged supply of fresh-water.
- The strandline of fine shingle or sandy beaches; plants survive only a short time.
- Beside streams, usually where these enter beaches.
- In dune slacks or their edges.

3.1 Surface area of habitat[2.5.2]
Unknown
Given the patchy nature of these habitats within the coastal habitat, it is very difficult to provide an area estimate for the current habitat, and no attempts have (as yet) been made to do so.

3.2 Date of estimation[2.5.3]
Not applicable

3.3 Quality of data on habitat area[2.5.4]
Poor

3.4 Habitat trend[2.5.5]
Stable
Currently, the extent of suitable habitat is most likely to be stable, with the majority of populations occurring in protected sites.

Historically, coastal defence works have had a damaging impact on several sites, and it therefore seems plausible to argue that there has been an overall reduction in the extent of suitable habitat across the range of this species. This occurred prior to the Directive coming into force. At Penhale, changes in the water table and drying out of the dune slack habitat may be major factors contributing to decline, however this is being addressed and is not sufficient to change the overall current trend. Several other small populations have lost plants in recent years due to beach erosion/cliff landslips associated with winter storms. This is the natural dynamic nature of the plant, and other areas of suitable habitat exist and are being colonised.

3.5 Habitat trend period[2.5.6]
1980 – 2006
The habitat trend is considered over the same time period as the range, which covers the time at which the Directive came into force. Most change in habitat occurred near the start of the twentieth century.

3.6 Reasons for reported trend in habitat[2.5.7]
Not applicable

3.7 Suitable habitat for the species (in km^2)[2.7.3]
Unknown

3.8 Habitat conclusion[2.8]
Favourable
Although there have probably been historic declines in habitat, most populations now lie within the protected sites network. Hopefully, therefore, human-induced habitat losses will be much less in future.

With regards to sites losses associated with winter storms, it is important to accept that this is a 'dynamic' species well-suited to growing in a particularly 'dynamic' environment; thus, it is probably well adapted to persisting at low population levels in such situations.

4. Future Prospects[2.6]
Good prospects
"Species is expected to survive and prosper".

The species is the subject of a Species Action Plan under the UK Biodiversity Action Plan. (It is also included on the revised UKBAP list.)

Although evidence suggests that *R. rupestris* is currently in decline, it is likely that populations have always been small and isolated; this is in the nature of both the species and the habitat niche it occupies.

If storms increase in incidence/severity, erosion would be likely to increase. However, the likelihood of this happening is uncertain. At the moment, plants lost through erosion *etc.* are being more or less compensated by new sites being discovered and, on existing sites, plants colonising new patches of suitable habitat.

Recent observed losses are not, by definition, irreversible, and we know of several sites where losses have been temporary, followed by spontaneous recovery. Indeed, there are sites where the species has 'come and gone' on several occasions, so we should be careful to avoid jumping to the conclusion that 'recovery' can only happen following deliberate human intervention. Apart from Penhale, which requires urgent action, the overall prospects are 'Good'. The bulk of existing populations (and also suitable, but currently unoccupied habitat, in the vicinity of these populations,) lie within the protected sites network. Many are also within Special Areas of Conservation (SACs).

Apart from Penhale, current UK population is stable, range is stable and amount of habitat is probably stable following an earlier decline due to coastal development/defence works which

undeniably led to the loss of several colonies. On this basis, the future prospects are being reported as Good.

4.1 Future prospects conclusion[2.8]

Favourable

Allowing for the fact that this is a dynamic species, it seems that the main pressures and threats are not significant and that the species will remain viable in the long term. Therefore, it is being reported as Favourable.

5. Overall Conclusion [2.8]

Favourable

All of the parameters are Favourable, and hence the overall conclusion is also Favourable. However, this conclusion is with low confidence, since there is currently a large decline in population. If this decline continues then the reporting category will change.

Table 5.1. Summary of conclusions

Parameter	Judgement	Grounds for Judgement (in accordance with Annex C)	Reliability*
Range	Favourable	Range is stable and not smaller than the favourable reference range	1
Population	Favourable	Populations not lower than favourable reference population and no evidence that reproduction, mortality and age structure deviate from normal	3
Habitat	Favourable	Area of habitat is sufficiently large (and stable) and habitat quality is suitable for the long term survival of the species	2
Future Prospects	Favourable	Main pressures and threats to the species not significant; species will remain viable in the long-term	2
Overall Assessment	Favourable	All favourable	3

*1=High, 2=Moderate, 3=Low

High – Expert opinion is that the concluding judgement accurately reflects the current situation based on a professional understanding of the species. For range, population, and habitat, quality of data used to establish the current estimate has been identified as "good"; data used to inform trends is comprehensive and up to date.

Moderate – A greater understanding of the feature, or the factors affecting it, is required before a confident concluding judgement can be made by experts. For range, population, and habitat, the current estimate and/or trend are based on recent, but incomplete or limited survey data; or alternately, a comprehensive, but outdated (pre-1994) review.

Low – Judgements, and comprising estimates, are based predominantly on expert opinion.

N/A – Assessment conclusion is "unknown", on the basis of insufficient reliable information

6. References

MCDONNELL, E.J. & KING, M. 2006. *Rumex rupestris* in SW England: review of recent surveys and assessment of current status. In: LEACH, S.J. *et al. Botanical Links in the Atlantic Arc*. BSBI Conference Report No. 24.

PRESTON, C.D., PEARMAN, D.A. & DINES, T.D. 2002. *New Atlas of the British & Irish Flora*. Oxford University Press.

Plantlife Species Dossiers: *Rumex rupestris*. Available online at
http://www.plantlife.org.uk/uk/plantlife-saving-species-dossier.html#Vascular

Map data source

Plantlife Species Dossier.