

**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:

S1903 - Fen orchid (*Liparis loeselii*)

**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>S1903</b>
	<b>0.2.2 Species scientific name</b>	<i>Liparis loeselii</i>
	<b>0.2.3 Alternative species scientific name</b> Optional	
	<b>0.2.4 Common name</b> Optional	<b>Fen orchid</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>Complete survey/Complete survey or a statistically robust estimate</b>
	There are at least annual monitoring surveys at all sites for <i>Liparis</i> and the range estimates therefore derive from a complete inventory.
<b>1.1.3 Year or period</b>	<b>2001-2012</b>
	Data is included from before 2007 as the species was recorded in two additional localities (SN30 and SS49) shortly before the reporting period. Given the possibility of undiscovered colonies of <i>Liparis</i> remaining in these sites the data is included as an indication of where the species may have still occurred up to 2007 - and, potentially, for a few years more.

	The effective disappearance of the species from this range, however, is confirmed by more recent data.
<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>"Newberry, C. &amp; Westwood, S. (2008) Kenfig SAC Petalwort <i>Petalophyllum ralfsii</i> (1395) &amp; Fen orchid <i>Liparis loeselii</i> (1903) Summary SAC Monitoring report (draft). Countryside Council for Wales, unpublished report.</b></p> <p><b>Wilkinson, K. (2007). Monitoring Report for Kenfig/Cynffig SAC 2002 - 2006. CCW internal report."</b></p>

<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>Complete survey/Complete survey or a statistically robust estimate</b></p> <p>There are at least annual monitoring surveys so the range estimate derives from a complete inventory.</p>								
<b>2.3.3 Short-term trend Period</b>	<p><b>2001-2012</b></p> <p>There is high quality data on <i>Liparis</i> for every year since the Directive came into force and the range trend has therefore been calculated for this period.</p>								
<b>2.3.4 Short term trend Trend direction</b>	<p><b>decrease &gt;1%/year</b></p> <p>There is clear evidence of decline since the 2007 reporting round, with the absence of this species from SS49, despite careful yearly searches (last record in bsbidb.org: 2004).</p>								
<b>2.3.5 Short-term trend Magnitude</b>	<table border="1"> <tr> <td><b>a) Minimum</b></td> <td><b>50</b></td> </tr> <tr> <td colspan="2">This is at least a 50% decline in the 2007-12 period, with the loss of a whole population (from the former total of just two). Taking the 2001-2012 time period there has been a loss in 2 out of 3 known localities, going from SN20 and SS49.</td> </tr> <tr> <td><b>b) Maximum</b></td> <td><b>75</b></td> </tr> <tr> <td colspan="2">There may be in excess of 50% decline if any marginal populations, potentially still extant in SN20 and SS79 have also disappeared. These</td> </tr> </table>	<b>a) Minimum</b>	<b>50</b>	This is at least a 50% decline in the 2007-12 period, with the loss of a whole population (from the former total of just two). Taking the 2001-2012 time period there has been a loss in 2 out of 3 known localities, going from SN20 and SS49.		<b>b) Maximum</b>	<b>75</b>	There may be in excess of 50% decline if any marginal populations, potentially still extant in SN20 and SS79 have also disappeared. These	
<b>a) Minimum</b>	<b>50</b>								
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<b>b) Maximum</b>	<b>75</b>								
There may be in excess of 50% decline if any marginal populations, potentially still extant in SN20 and SS79 have also disappeared. These									

	were not recorded in the last reporting round but were thought to have been potentially still extant up to 2005. Despite repeated careful searches <i>Liparis</i> has not been found recently at any of these former sites in (or in SN30) and there is evidence of significantly deteriorated habitat conditions at all these sites.	
<b>2.3.6 Long-term trend Period</b>	<b>1989-2012</b>	
	The recent trend outlined in note 2.3.5a (above) continues a long-term decline over 24 years +. During this period the species' disappearance from SS58 (c.1972) continued into the more recent declines in SN30 (last seen 1993), in SS79 (around 1998), SS20 (2002) and lastly SS49 (2004).	
<b>2.3.7 Long-term trend Trend direction</b>	<b>decrease &gt;1%/year</b>	
	The loss of <i>Liparis</i> from SS49 since the last reporting round (and its failure to reappear in SN20 despite careful habitat management) demonstrates a decline much greater than 1% per year.	
<b>2.3.8 Long-term trend Magnitude</b>		<b>75</b>
	<b>a) Minimum</b>	
Optional	The minimum long term trend (over a 24 year period) is at least 75%, with the loss of this species from SN30, SS49 and SS79.	
	<b>b) Maximum</b>	<b>80</b>
	The long term, 24 year decline for <i>Liparis</i> in Wales could be 80% or higher, with the possible disappearance of this species (or at least its failure to be refound) in SN30 and the loss of at least two localities within SS79. It is even possible that the species underwent an even more serious 80%+ decline if earlier records from SS58 were finally deemed extinct during this period.	
<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>	<b>a) Genuine change?</b>	<b>True</b>
Is the difference between the reported value in 2.3.1 and the previous reporting round	The declines outlined in notes 2.3 (above) are genuine and supported by careful systematic searches at all former sites.	

mainly due to...	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	Repeated, systematic surveys and a greater understanding of the species' habitat and ecology represent an overall improvement in knowledge and better / more accurate data.	
	<b>c) Use of different method (e.g. "Range tool")?</b>	<b>False</b>

<b>2.4 Population</b>		
<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>
	Liparis is a relatively short-lived, early successional species and its populations are generally dynamic and mobile. Units of population are therefore described as the species' occurrence in an area of continuous habitat.	
	<b>b) Minimum</b>	<b>1</b>
	Liparis is now restricted to one population, at Kenfig NNR (Glamorgan).	
	<b>c) Maximum</b>	<b>1</b>
Repeated annual searches at former sites in Pendine SN20 (last seen 2002) and Whiteford SS49 (last seen 2004/5) strongly indicate that Liparis is now reduced to one population, confined to a single location.		
<b>2.4.3 Additional information on population estimates / conversion</b> Optional	<b>a) Definition of "locality"</b>	<b>The localities for Fen orchid in Wales are large DUNE SYSTEMS - incorporating mobile foredunes, crescentic dunes, (frequently) stabilised dune grasslands and, crucially, large slacks or dune wetlands.</b>
	The localities for <i>Liparis loeselii</i> var <i>ovata</i> , the distinct variant found in Atlantic South Wales and northern France, are individual dune systems (requiring a wide range of topographic and hydrological attributes and subject to active geomorphological processes). Liparis is restricted to early-successional dune slacks which need to be constantly regenerated and the habitat is therefore as dependent upon processes as upon exact localities.	
	<b>b) Method to convert data</b>	
Individual counts of Liparis have been undertaken at all its known sites in Wales since the Directive came into force but they show significant annual fluctuation, probably as a result of multiple interacting factors,		

	such as hydrology, annual weather patterns, demographic patterns and local management.	
	<b>c) Problems encountered to provide population size estimation</b>	<b>There are difficulties in both units of generalised locality (lacking precision) and individual counts (tending to reflect short term fluctuation). For dune populations, a more useful measure of abundance would probably be "occupied dune slacks" and, for both habitats "areas of early successional habitat". The definition is probably less clear, however, for fenland habitats and this emphasises the main problem with reporting <i>Liparis</i> condition for the UK as a whole. The dune form of fen orchid (<i>Liparis loeselii</i> var <i>ovata</i>) differs significantly from the fenland variety in its habitat, ecology, history and management and, for the purposes of UK reporting, in terms of its trends and measurement.</b>
	Whilst data on localities (dune systems in Wales) only provides a very coarse measurement of change and short term trends are difficult to discern in counts of individual plants (see note 2.4.3b above) the better measurement of "occupied dune slacks" only works for Wales. This reinforces the more general point that UK counts of <i>Liparis</i> are attempting to combine two populations with very different ecology, dynamics, management, history and, even, taxonomic status. In view of other populations of <i>Liparis loeselii</i> var <i>ovata</i> in France and Holland it would be more useful to assess the status of Welsh plants in the wider European context - but separately from those in East Anglia.	
<b>2.4.4 Year or period</b>	<b>2001-2012</b>	
	Information included from 2001, to reflect the recent trend in site occupancy up to 2007.	
<b>2.4.5 Method used Population size</b>	<b>Complete survey/Complete survey or a statistically robust estimate</b>	
	There is good data on the number of occupied localities for fen orchid (and detailed counts of flowering and non-flowering individuals) with at least annual monitoring surveys.	
<b>2.4.6 Short-term trend Period</b>	<b>2001-2012</b>	
	See note 2.4.4 above.	
<b>2.4.7 Short-term trend Trend direction</b>	<b>decrease &gt;1%/year</b>	
	The decline in <i>Liparis</i> (disappearing entirely from one of its two recent localities) is at least 50%	
<b>2.4.8 Short-term trend Magnitude</b>	<b>a) Minimum</b>	<b>50</b>
	The disappearance of fen orchid from Whiteford took place some time shortly after 2005 (the date of its last recorded appearance here). Inconspicuous or ephemeral non-flowering plants may have persisted after 2007 be were judged to have become extinct by c.2009. This represents the loss of 50% of the species' range in Wales.	
	<b>b) Maximum</b>	<b>50</b>

	See above 2.4.8a	
	<b>c) Confidence interval</b>	
<b>2.4.9 Short-term trend Method used</b>	<b>Complete survey/ Complete survey or a statistically robust estimate</b>	
	The direction of short-term trend can be determined with great accuracy at the locality scale as detailed counts for this species take place in all areas of occupied habitat (with additional surveys of former habitat), at least once a year; see note 2.4.5 above.	
<b>2.4.10 Long-term trend – Period</b>	<b>1987-2012</b>	
	The long term trend goes back to before 1987 (when <i>Liparis</i> was formerly present in SS58) but even within this period it shows a clear and continued decline.	
<b>2.4.11 Long-term trend Trend direction</b>	<b>decrease &gt;1%/year</b>	
	At least 4 out of 5 sites have been lost in the long-term (post 1987) and all these losses have actually occurred since 1993. This represents an 80% reduction in 20 years or a long term trend direction of -4% p.a.	
<b>2.4.12 Long-term trend Magnitude</b>	<b>a) Minimum</b>	<b>80</b>
Optional	The minimum figure in a long-term trend for fen orchid ( <i>Liparis loeselii</i> var <i>ovata</i> ) localities in south Wales is an 80% decline, based on detailed surveys of all known habitat.	
	<b>b) Maximum</b>	<b>80</b>
	Fen orchid records from Oxwich, South Gower SS58 continued up to c.1978 and it is possible that small populations of fen orchid remained undetected at this locality into the long term trend period (c.1989). On another measure of abundance it is clear that Whiteford represented a very large population (perhaps exceeding 10,000 individual plants) during this period and the decline in overall abundance to fewer than 200 plants at Kenfig is clearly much >80% in the long term trend.	
	<b>c) Confidence interval</b>	
<b>2.4.13 Long term trend Method used</b>	<b>3</b>	
	See notes for 2.4.5	
<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>
	Liparis has been monitored at least annually (and more often 2 or 3 times a year) at all extant Welsh sites, with detailed individual counts. The declines and fluctuations have all been very carefully observed and the subsequent failure to relocate individual plants are recorded after many man-hours of thorough searching. These changes are confirmed and genuine, resulting from a recorded deterioration in habitat.	
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	As in the previous note 2.4.15a, there has been a consistently high level of monitoring during the recent reporting round, with improved access to historic data and better co-ordination and analysis of results.	
	<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>8.24</b> The entire area of dune system (as in 2.4.3 and accompanying note) is given as the effective habitat, although <i>Liparis</i> is restricted to seasonally wet dune slacks. In practice, areas of early successional habitat (such as dune slacks) cannot exist outside of the wider dune system and it is for this reason that the larger area is provided here in response.  There is not 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>2003-2012</b> This includes information from 2003-2012 since the area of effective habitat for <i>Liparis</i> has significantly altered in the preceding period. <i>Liparis</i> was present at two other localities (totalling >10 km sq) between 2001 and 2007 but disappeared from both these sites.
<b>2.5.3 Method used Habitat for the species</b>	<b>Complete survey/Complete survey or a statistically robust estimate</b>

	The area of dune systems currently supporting <i>Liparis</i> is calculated from Ordnance Survey data. This is a complete survey as described in 2.4.5.	
<b>2.5.4 Quality of the habitat</b>	<b>a) Habitat quality</b>	<b>Moderate</b>
	The decline in species occurrence indicates that habitat quality is generally poor. However, at Kenfig (where the population has been maintained by regular mowing and new slack creation) the habitat for <i>Liparis</i> is maintained or even improving. This gives a "moderate" habitat quality.	
	<b>b) Assessment method</b>	<b>The best indicator of habitat is the presence of <i>Liparis</i> and surveys prior for this species prior to 2007 showed its decline and subsequent loss from the Gower and Carmarthenshire localities. This measurement also provides a basic quality assessment at extant localities and shows the limited extent of currently favourable habitat (largely maintained by mowing and active slack creation) at Kenfig. Further assessment of <i>Liparis</i> habitat comes from ecological studies and detailed monitoring of the habitat.</b>
<b>2.5.5 Short-term trend Period</b>	<b>2001-2012</b>	
	As for population trends: see previous notes 2.4.4 etc.	
<b>2.5.6 Short-term trend Trend direction</b>	<b>decrease</b>	
	The decline in habitat corresponds to the disappearance of <i>Liparis</i> populations and is almost certainly responsible for this trend. Recent population counts since 2004-5 could represent a period of relative stability (although at a very low level >200 individuals) with a very local expansion in range but this is temporary and currently still uncertain.	
<b>2.5.7 Long-term trend Period</b>	<b>1989-2012</b>	
	As for population trends: see previous note 2.4.10	
<b>2.5.8 Long-term trend Trend direction</b>	<b>decrease</b>	
	The disappearance of <i>Liparis</i> from former sites (eg. SN20 & SS49) noted in 2.4.10 etc, reflects the decline in available early successional habitat (see note 2.5.6) and a long term decline in quality.	
<b>2.5.9 Area of suitable habitat for the species</b>	<b>a) Value in km<sup>2</sup></b>	<b>12.44</b>
	The only current area of suitable habitat for <i>Liparis</i> is Kenfig NNR dune system (including the wider fixed dune grasslands, permanent water-bodies and embryonic dunes. The effective early-successional habitat within this is limited to 4 or 5 dune slacks with a total area of less than 0.07 km sq (with about the same area of further newly-created slacks, still unoccupied by <i>Liparis</i> ) but these areas of occupancy cannot be detached from the wider actual habitat. The area of Kenfig NNR has been calculated from OS data.	
	<b>b) Absence of data indicated as '0'</b>	
<b>2.5.10 Reason for change</b> Is the difference between the	<b>a) Genuine change?</b>	<b>True</b>

value reported at 2.5.1 and the previous reporting round mainly due to	The declining area of early-successional dune slacks in south Wales is associated with reduced grazing, scrub encroachment and stabilisation of the wider dune systems. This reflects a long term trend in reduced disturbance (most notably from livestock grazing but also rabbit populations, following myxomatosis), dune stabilisation and scrub encroachment (notably by the non-native <i>Hippophae rhamnoides</i> ), with the added influence of conifer plantations, reduced human access disturbance and increased nutrient enrichment (including atmospheric nitrogen). All of these limit the effects of natural, extreme-weather disturbance, creating a long term decline in <i>Liparis</i> habitat.	
	<b>b) Improved knowledge/more accurate data?</b>	<b>True</b>
	There is constantly improving data on habitat condition, using remote sensing (air surveys) and detailed site monitoring.	
	<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	
A04: grazing	H	
B07: Forestry activities not referred to above	M	
H04: Air pollution, air-borne pollutants	M	N
I01: invasive non-native species	M	
J02: human induced changes in hydraulic conditions	M	
K02: Biocenotic evolution, succession	M	

A04: lack of appropriate grazing - especially traditional wintering livestock on dune-systems and rabbit grazing (following myxomatosis); B07: non-native forestry plantations at Whiteford and Pembrey stabilise dune systems in their immediate vicinity, shield against wind-disturbance and affect dune hydrology (lowering water tables); I01: *Hippophae rhamnoides* is invasive, especially around the Burry Inlet (Whiteford, Pendine & Pembrey), stabilising dunes and preventing natural remobilisation of habitat; H04: the annual deposition of atmospheric nitrogen, estimated at c.25 kg / ha / yr enhances the growth of coarse vegetation, and is particularly influential in naturally low-nutrient ecosystems such as dunes, affecting natural remobilisation and the growth of competitive early-successional species in the *Liparis* dune slack habitat; J02: dredging or removal of sediments in Swansea Bay contributes to the lack of foredune replenishment at Kenfig; K02: scrub invasion and successional change has occurred as a natural process, preventing the formation of new early-successional habitat, after anthropogenic factors (A04, B07, H04, I01

& J02) affected the dune systems more generally, limiting the influence of further natural occurrence - such as storm disturbance.

<b>2.6.1 Method used – Pressures</b>	<b>mainly based on expert judgement and other data</b>
	There is a considerable amount of information on the fen orchid habitat and other localities to support this inventory of threats / pressures but their interaction and relative significance is highly complex and still not fully understood (for instance, atmospheric nitrogen clearly interacts with the absence of grazing but might affect the growth of nitrogen-fixing Hippophae in a more complex fashion; the relationship between storm disturbance and hydrology is unclear etc.). For these reasons it is necessary to evaluate the threats and pressures.

2.7 Threats		
a) Threat	b) Ranking	c) Pollution qualifier
	H = high importance M = medium importance L = low importance	
A04: grazing	H	
B07: Forestry activities not referred to above	M	
H04: Air pollution, air-borne pollutants	M	N
I01: invasive non-native species	M	
J02: human induced changes in hydraulic conditions	M	
K02: Biocenotic evolution, succession	M	

see note 2.6 (above). Lack of adequate grazing (A04), atmospheric nitrogen deposition (H07) and invasive Hippophae (I01) all affect successional processes (inadequate grazing pressures being judged the most serious of these), threatening loss of *Liparis* habitat. Forestry (B07) and dredging (J02) both directly remove habitat and threaten the integrity of the dune system. Ultimately, all of these pressures affect successional change (K02), which threatens the delicate stage in dune slack formation that *Liparis loeselii* requires.

<b>2.7.1 Method used – Threats</b>	<b>expert opinion</b>
	See note for 2.6.1

2.8 Complementary information	
<b>2.8.1 Justification of % thresholds for trends</b>	
<b>2.8.2 Other relevant</b>	

<b>information</b>	
<b>2.8.3 Trans-boundary assessment</b>	

### 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

<b>3.1.1 Population size</b>  Estimation of population size included in the SAC network	<b>a) Unit</b>	<b>number of localities</b>
	See note for 2.4.2a (above).	
	<b>b) Minimum</b>	<b>1</b>
	See note 2.4.2b	
	<b>c) Maximum</b>	<b>1</b>
See note 2.4.2c		
<b>3.1.2 Method used</b>	<b>Complete survey/Complete survey or a statistically robust estimate</b>	
See note 2.4.5		
<b>3.1.3 Trend of population size within the network</b> (short-term trend)	<b>decrease</b>	
	All <i>Liparis</i> is within the SAC network. See note 2.4.7.	

#### 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.

<b>3.2.1 Measure</b>	<b>3.2.2 Type</b>	<b>3.2.3 Ranking</b>	<b>3.2.4 Location</b>	<b>3.2.5 Broad evaluation of the measure</b>
		H = high importance	where the measure is PRIMARILY applied	

	a) Legal/statutory	b) Administrative	c) Contractual	d) Recurrent	e) One-off	M = medium importance  L = low importance	a) Inside	b) Outside	c) Both inside & outside	a) Maintain	b) Enhance	c) Long term	d) No effect	e) Unknown	f) Not evaluated
2.1: Maintaining grasslands and other open habitats				Y		M	Y			Y	Y	Y			
4.4: Restoring coastal areas				Y		H	Y			Y	Y	Y			
6.3: Legal protection of habitats and species	Y	Y				M	Y			Y					

4.4: has involved scraping dune slacks and artificially restoring dune mobilisation at Kenfig NNR (and, unsuccessfully for the survival of *Liparis*, in the Carmarthen Bay dunes SAC); 2.1: mowing, grazing and control of shrubs have all been undertaken with some success for the *Liparis* population at Kenfig NNR (and elsewhere in the Carmarthen Bay Dunes SAC, but without any recent success so far in terms of *Liparis* populations); 6.3: maintaining legal protection of the species and its habitat through Schedule 8 of the Wildlife and Countryside Act and SSSI notifications has directly enabled conservation of *Liparis* populations and their habitat.