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:

S1014 - Narrow-mouthed whorl snail (*Vertigo angustior*)

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	**1014**
1.3 Species scientific name	**Vertigo angustior**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Narrow-mouthed whorl snail

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2005-2017
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: S1014 - Narrow-mouthed whorl snail (Vertigo angustior).
Fowles, A. & Guest, D. 2006. Narrow-mouthed whorl snail Vertigo angustior at Whiteford Burrows. In: Monitoring nature conservation in cultural habitats: a practical guide and case studies. Eds. C. Hurford & M. Schneider, pp. 259-270. Dordrecht, Springer.
Harper, J. 2007. Survey of Pembrey Forest, Carmarthenshire, for the narrow-mouthed whorl snail Vertigo angustior. Unpublished report. Countryside Council for Wales.
Harper, J. 2014. Surveillance of the narrow-mouthed whorl snail Vertigo angustior at Pembrey, Carmarthen Bay Dunes SAC. NRW Evidence Report 10. Natural Resources Wales.
Holyoak, D.T. & Willing, M.J. 1999. Survey for Vertigo angustior at selected localities in West Glamorgan. CCW Contract Science. 222. Countryside Council for Wales.
Killeen, I.J. 1993. The distribution and ecology of the snail Vertigo angustior at Oxwich and Whiteford Burrows NNRs, Gower, South Wales. CCW Contract Science. 20. Countryside Council for Wales.
Preece, R.C. & Willing, M.J. 1984. Vertigo angustior living near its type locality in south Wales. Journal of Conchology, 31: 340.
Wilkinson, K. 2006. Vertigo angustior: Monitoring of Whiteford Burrows, part of

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Carmarthen Bay Dunes SAC. Unpublished report. Countryside Council for Wales.
Wilkinson, K. 2012. Vertigo angustior Carmarthen Bay Dunes SAC monitoring - Monitoring Round 2007 to 2013. Unpublished report. Countryside Council for Wales.
Wilkinson, K. in prep. Carmarthen Bay SAC monitoring report Vertigo angustior - Monitoring Round 2013 to 2018. Unpublished report. Natural Resources Wales.
Willing, M.S. 1997. A preliminary survey of areas in the vicinity of Pembroke for populations of the Red Data molluscs Vertigo angustior and Pseudamnicola confusa. Unpublished report. Countryside Council for Wales.

5. Range

5.1 Surface area (km²)		
5.2 Short-term trend Period		
5.3 Short-term trend Direction	Stable (0)	
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	No change The change is mainly due to:	
5.12 Additional information		

6. Population

6.1 Year or period	2005-2017	
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	12
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	2005-2017
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	
6.12 Long-term trend Direction	Uncertain (u)
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	No information on nature of change The change is mainly due to:
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)?	Unknown
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	Unknown
7.2 Sufficiency of area and quality of occupied habitat Method used	Insufficient or no data available	
7.3 Short-term trend Period	2005-2017	
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)	M
Extensive grazing or undergrazing by livestock (A10)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Accumulation of organic material (L03)	M
Flooding (natural processes) (M08)	M

Threat	Ranking
Intensive grazing or overgrazing by livestock (A09)	M
Extensive grazing or undergrazing by livestock (A10)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Accumulation of organic material (L03)	M
Flooding (natural processes) (M08)	M
Sea-level and wave exposure changes due to climate change (N04)	M
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, but none yet 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: Both inside and outside 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)

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

10.1 Future prospects of parameters

a) Range

b) Population

c) Habitat of the species

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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	6

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

13.2 Trans-boundary assessment

13.3 Other relevant Information

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Distribution Map

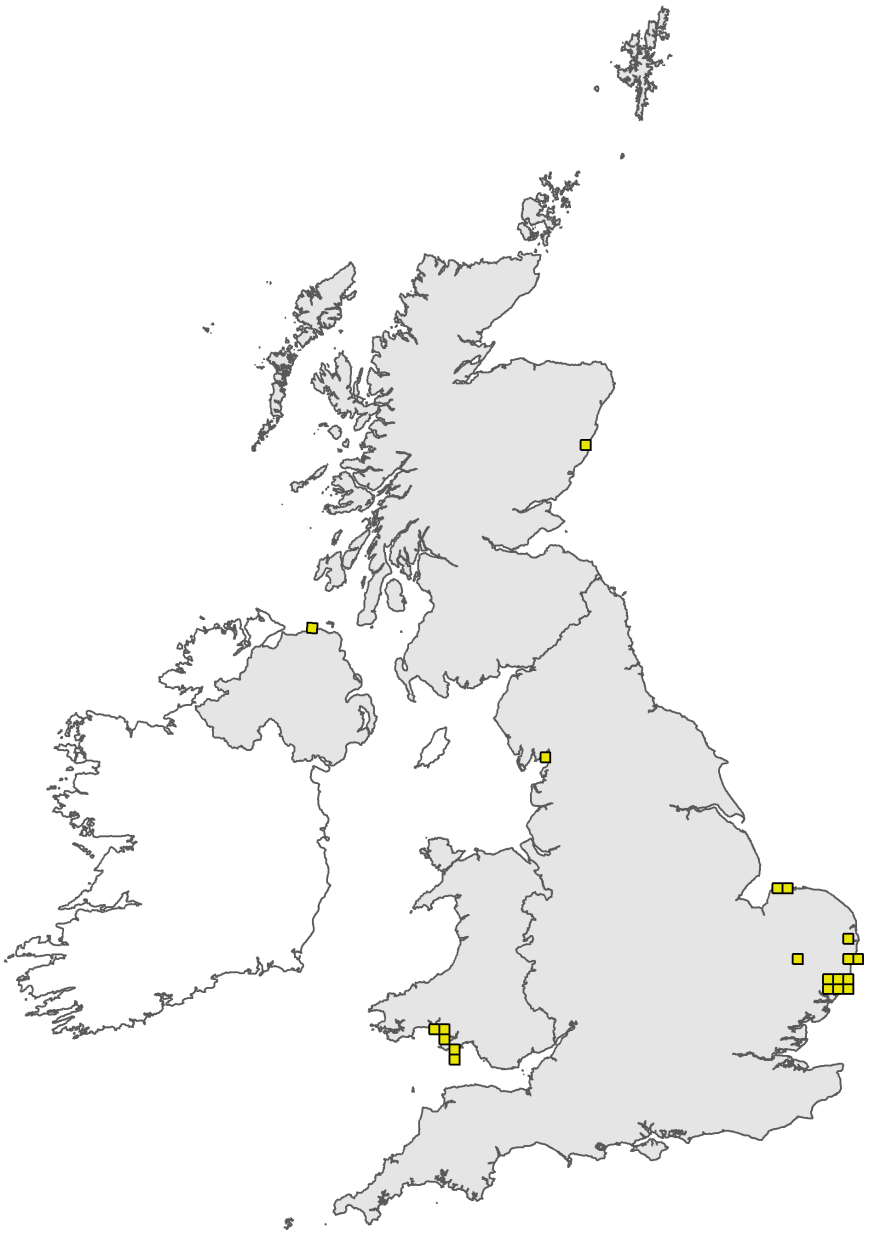

Figure 1: UK distribution map for S1014 - Narrow-mouthed whorl snail (*Vertigo angustior*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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 S1014 - Narrow-mouthed whorl snail (*Vertigo angustior*). 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 angustior (1014) Region code: ATL

Field label	Note
5.11 Change and reason for change in surface area of range	In Wales, Vertigo angustior is apparently confined to a relatively small area of coastline in Carmarthenshire and West Glamorgan incorporating the Pembrey dune system (Pembrey Aerial Firing Range & Pembrey Forest), Whiteford Burrows (including Cwm Ivy Marsh) and Oxwich Burrows (Harper, 2007, 2014; Willing 1997, Holyoak & Willing 1999). A survey in 2016 by NRW recorded the snail at all three localities, albeit in small numbers (Wilkinson, in prep.). Whilst range may be stable, populations at the three localities are under threat and the one on Whiteford Burrows is declining.
6.2 Population size	There are 12 occupied 1x1km grids since year 2000, with 8 on Pembrey, 2 on Whiteford and 2 on Oxwich. This is based mainly on records supplied from surveys undertaken by Harper (2007, 2014) and NRW SAC monitoring data (Wilkinson, 2006, 2012, in prep.).
6.8 Short term trend; Direction	Whilst small sub-populations have been found that increased the pseudo-spatial population count, the individual snail counts on sites have deteriorated including some very large population falls. This underpinning evidence has driven the conclusion of a decreasing population trend over the 2005-20017 period.
6.10 Short term trend; Method used	Whilst Vertigo angustior was recorded at all three localities in 2016, numbers were small. Populations at Oxwich and Pembrey are small but the population at Whiteford has historically been very strong, numbering in the 1000s and providing the basis for assessing the SAC feature to be in Favourable condition in the two previous reporting rounds. However, snails proved difficult to find during the peak monitoring period in May 2016, suggesting a sharp population decline. Few snails were found during additional visits in August and September 2016, confirming this decline. Episodic monitoring makes it difficult to determine if the decline is real, just a temporary issue or an artefact of sampling but it has been assessed as Unfavourable with a decreasing trend, following multiple visits in 2016 and early 2017.
6.14 Long term trend; Method used	Whilst Vertigo angustior was recorded at all three localities in 2016, numbers were small. Populations at Oxwich and Pembrey are small (other than a count of 800+ dead snails on Tywyn Burrows) but the population at Whiteford has historically been very strong, numbering in the 1000s and providing the basis for assessing the SAC feature to be in Favourable condition in the two previous reporting rounds. However, snails proved difficult to find during the peak monitoring period in May 2016, suggesting a sharp population decline. Few snails were found during additional visits in August and September 2016, confirming this decline. Episodic monitoring makes it difficult to determine if the decline is real, just a temporary issue or an artefact of sampling but it has been assessed as Unfavourable with a decreasing trend, following multiple visits in 2016 and early 2017.
7.2 Sufficiency of area and quality of occupied habitat; Method used	The habitat in the core area at Whiteford has been mapped (Killeen 1993, Fowles & Guest 2006) and here the snail extends over 1.8ha of saltmarsh transition. The mature dune slack where the snail was first recorded in 2006 and again in 2016 has yet to be mapped. Harper (2007, 2014) indicates sample areas where Vertigo angustior has been recorded on Pembrey. Most of these sites are narrow (some only 50cm wide) strips between 50 and 200m long, although a larger area of fen on Pembrey Aerial Firing Range is also known to support the species. In total, these areas will only amount to a couple of hectares. No habitat mapping has taken place at Oxwich and here the snail is known from small pockets of saltmarsh fen at the rear of the Burrows, probably amounting to less than 1ha. It is possible that the area of habitat is sufficient at Whiteford but too small at Pembrey and Oxwich. There is thought to be a sufficient amount of habitat in the UK to support a viable population of the species.

7.5 Short term trend; Method used	The habitat on Whiteford Burrows has been mapped in 1993 (Killeen 1993) and 2001 (Fowles & Guest, 2006), Wilkinson (2006, 2012) determined habitat quality using point-based sampling. Habitat patches were identified in 2001 by defining the characteristics of 'optimal' habitat and plotting areas that matched this description. Subsequently transects across the saltmarsh transition zone have been assessed to record the amount of optimal habitat within each sample section. On Pembrey, areas corresponding to perceived suitable habitat were sketched onto base maps by a contractor (Harper, 2007, 2014) but patches have not been plotted in detail. No mapping of the occurrence of suitable habitat has taken place on Oxwich. Habitat quality has only been assessed on Whiteford SAC. In 2012, 32% of sample points were assessed as in optimal condition, whereas the overall target set in the Conservation Objective is for 20% of samples to be classed as Optimal (Wilkinson, 2012). However, one of the six sections failed by 2% of its individual target due to a lack of leaf litter and the failure of this one section resulted in the condition of the Feature being reported as Unfavourable. Despite this, most of the habitat in the key stronghold on Whiteford was in good condition in 2012. Partial habitat monitoring in 2016 suggest no real change in the proportion of optimal habitat although casual observations suggest that the vegetation is getting ranker. The amount of suitable habitat on Whiteford in 2012 was effectively unchanged since the distribution of Vertigo angustior was first mapped here in 1993 (Fowles & Guest, 2006; Killeen 1993). There have been minor fluctuations in habitat patches due to dynamic succession on the saltmarsh ecotone but overall this is insignificant. On the adjacent Cwm Ivy Marsh (managed by the National Trust) habitat quality has varied over the years and this may have changed dramatically as a consequence of managed retreat and a return/restoration of saltmarsh conditions. At Oxwich, natural succession has presumably reduced the availability of suitable habitat over time but at the snail still occupied small pockets of habitat in 2006 and 2016, as it has done for the last thirty years or so. On Pembrey, where the snail was only discovered in 2005, the snail occupies dune slack fen, saltmarsh transitions and remnant dune grassland beneath conifer plantations. The establishment of the forest at Pembrey (over 50 years ago) would have caused the loss of some habitat but over the last 24 years changes will have been minimal. On the Aerial Firing Range, the amount of suitable habitat will fluctuate as dune slacks mature and the saltmarsh transition zone fluctuates naturally but in the long-term these changes are likely to even out and the overall amount of suitable habitat will remain relatively stable.
8.1 Characterisation of pressures/ threats	Pressures: As Vertigo angustior chiefly occupies ecotonal habitats in Wales, the main pressure is from natural succession. This is held in check at Whiteford by grazing (ponies and sheep) and either under (A10) or over-grazing (A09) could cause a deterioration in habitat quality. The composition of habitat is monitored on Whiteford as part of the SAC features monitoring for angustior and this gives indications of changes to vegetation composition (L02 & L03) that reflect inappropriate gazing management and natural succession. Flooding (M08) could result in the loss of the core area. Threats: As indicated under Pressures, the main threat to angustior habitat in Wales is from successional changes to coastal ecotones. These could conceivably arise from natural succession if not held in check by grazing intervention (A09, A10) or from sea-level rise (M08, N04, N05) if this causes significant changes in the nature of the ecotonal habitats.
9.5 List of main conservation measures	Conservation effort to date has been confined to the maintenance of appropriate grazing levels (CA05, CL01 & CS03) on Whiteford Burrows.

10.1 Future prospects of parameters	In Wales, Vertigo angustior is apparently confined to a relatively small area of coastline in Carmarthenshire and West Glamorgan incorporating the Pembrey dune system (Pembrey Aerial Firing Range & Pembrey Forest), Whiteford Burrows (including Cwm Ivy Marsh) and Oxwich Burrows (Harper, 2007, 2014; Willing 1997, Holyoak & Willing 1999), with historical records from Swansea (its type locality) and Tenby. The population on Oxwich Burrows is small and restricted to a small area of saltmarsh-dune transition, whilst that on the Pembrey dune system is more scattered with small numbers found at several localities on the Firing Range and the forest where it is typically associated with mature dune slacks. It was first recorded on Pembrey in 2005. The population on Whiteford Burrows has been regarded as the largest in the UK where the snail is largely associated with a narrow transition zone between saltmarsh and dune habitats. An additional sub-population was found in a mature dune slack in 2006. Since 2001, a SAC monitoring programme on Whiteford Burrows has focussed on the transition zone. It has yet to to be expanded to account for the dune slack sub-population and the population o the Pembrey dune system. A survey in 2016 by NRW recorded the snail on all three dune systems, albeit in small numbers. The population in the Whiteford transition zone appears to have crashed and has recently been assessed as Unfavourable with a decreasing trend (Wilkinson, in prep.). Therefore, whilst range is stable, populations are under threat. Small populations on Pembrey and Oxwich are vulnerable to stochastic extinctions. The snail population, habitat quantity & quality on Whiteford have been relatively stable during the period 1993 to 2012. The dramatic fall in snail distribution and numbers in 2016 is a cause for concern on the long-term prospects here and has resulted in an assessment of Unfavourable Condition with a decreasing trend (Wilkinson, in prep.). The reasons for the decline need to be determined and addressed by sympathetic management to restore the population.