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:

S1833 - Slender naiad (*Najas flexilis*)

ENGLAND

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 (England information only)**
1.2 Species code	**1833**
1.3 Species scientific name	**Najas flexilis**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Slender naiad

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2013-2018
2.3 Distribution map	Yes
2.4 Distribution map Method used	Complete survey or a statistically robust estimate
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

WINGFIELD, R. 2004. The Ecology of Najas flexilis. Scottish Natural Heritage. Commissioned Report No. 017.
PRESTON, C.D., PEARMAN, D.A. & DINES, T.D. 2002. New Atlas of the British & Irish Flora. Oxford University Press.
http://data.ecn.ac.uk/sites/ecnsites.asp?site=L05
http://data.ecn.ac.uk/Data_discovery/searchresults.asp?t=1&search=SITE&sites=L05
Maberly, S. C., De Ville, M. M., Thackeray, S. J., Ciar, D., Clarke, M., Fletcher, J. M., J. James, B., Keenan, P.,
Mackay, E. B., Patel, M., Tanna, B. & Winfield, I.J. 2016. A survey of the status of the lakes of the English Lake District: The Lakes Tour 2015. Lake Ecosystems Group, Centre for Ecology & Hydrology report to United Utilities.
Maberly S.C. De Ville M.M., Kelly J. & Thackeray S.J. (2011). The state of Esthwaite Water in 2010. A report to Natural England. 34pp.

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

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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	2013-2018	
6.2 Population size (in reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value	number of map 1x1 km grid cells (grids1x1) 0
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		
6.6 Population size Method used	Complete survey or a statistically robust estimate	
6.7 Short-term trend Period	2013-2018	
6.8 Short-term trend Direction	Stable (0)	
6.9 Short-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval	
6.10 Short-term trend Method used	Complete survey or a statistically robust estimate	
6.11 Long-term trend Period		
6.12 Long-term trend Direction		
6.13 Long-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval	
6.14 Long-term trend Method used		

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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 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)?	No
	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	Based mainly on extrapolation from a limited amount of data	
7.3 Short-term trend Period	2013-2018	
7.4 Short-term trend Direction	Increasing (+)	
7.5 Short-term trend Method used	Based mainly on expert opinion with very limited 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
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	M

Threat	Ranking
Agricultural activities generating diffuse pollution to surface or ground waters (A26)	H

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 and taken

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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	Only inside Natura 2000
9.4 Response to the measures	Long-term results (after 2030)
9.5 List of main conservation measures	

Reduce/eliminate point source pollution to surface waters from freshwater aquaculture (CG11)

Reduce diffuse pollution to surface or ground waters from agricultural activities (CA11)

9.6 Additional information

10. Future prospects

10.1 Future prospects of parameters	a) Range b) Population c) Habitat of the species
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 b) Minimum c) Maximum d) Best single value
12.2 Type of estimate	

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12.3 Population size inside the network Method used	
12.4 Short-term trend of population size within the network Direction	
12.5 Short-term trend of population size within the network Method used	
12.6 Additional information	There are no SAC sites for this species in England as it has been regionally extinct since about 1982.

13. Complementary information

13.1 Justification of % thresholds for trends	
13.2 Trans-boundary assessment	
13.3 Other relevant Information	

Distribution Map

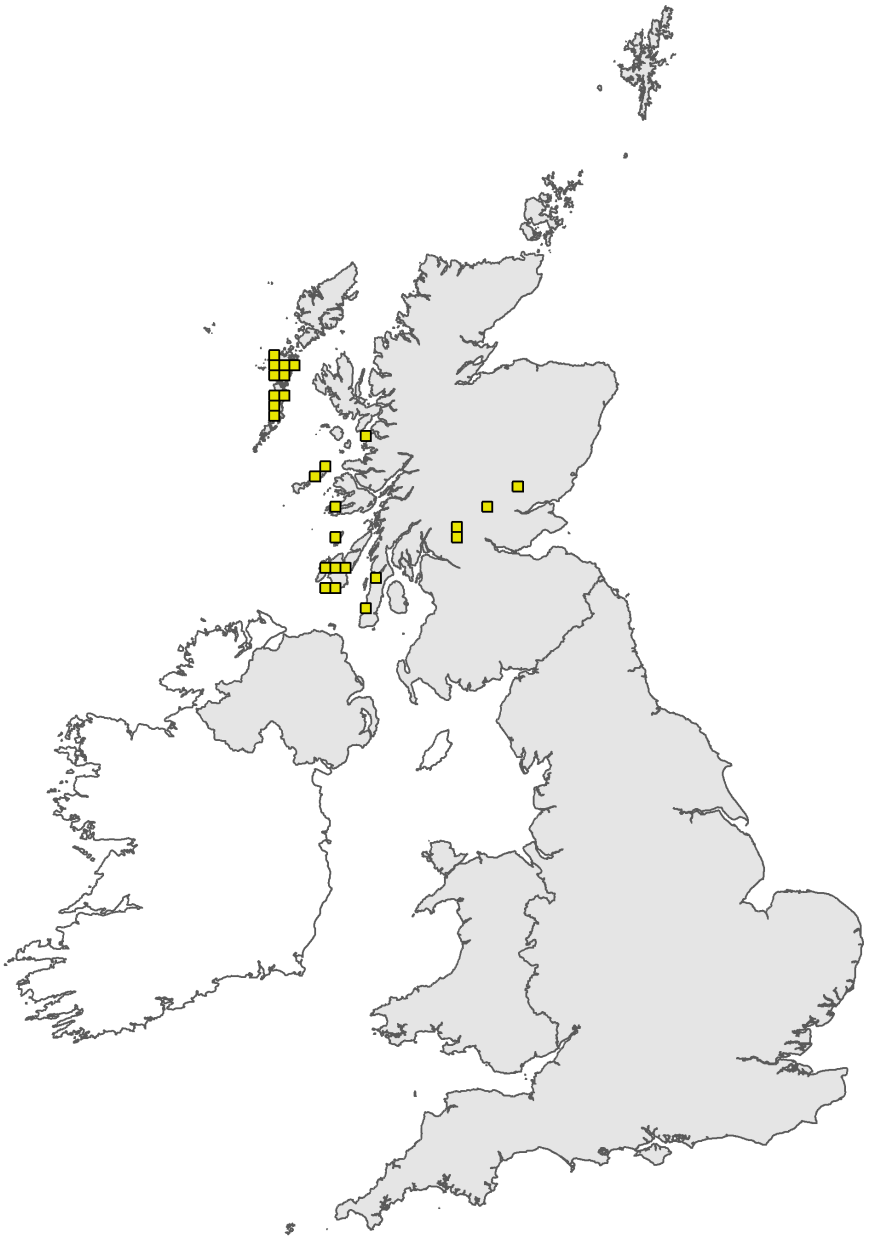

Figure 1: UK distribution map for S1833 - Slender naiad (*Najas flexilis*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

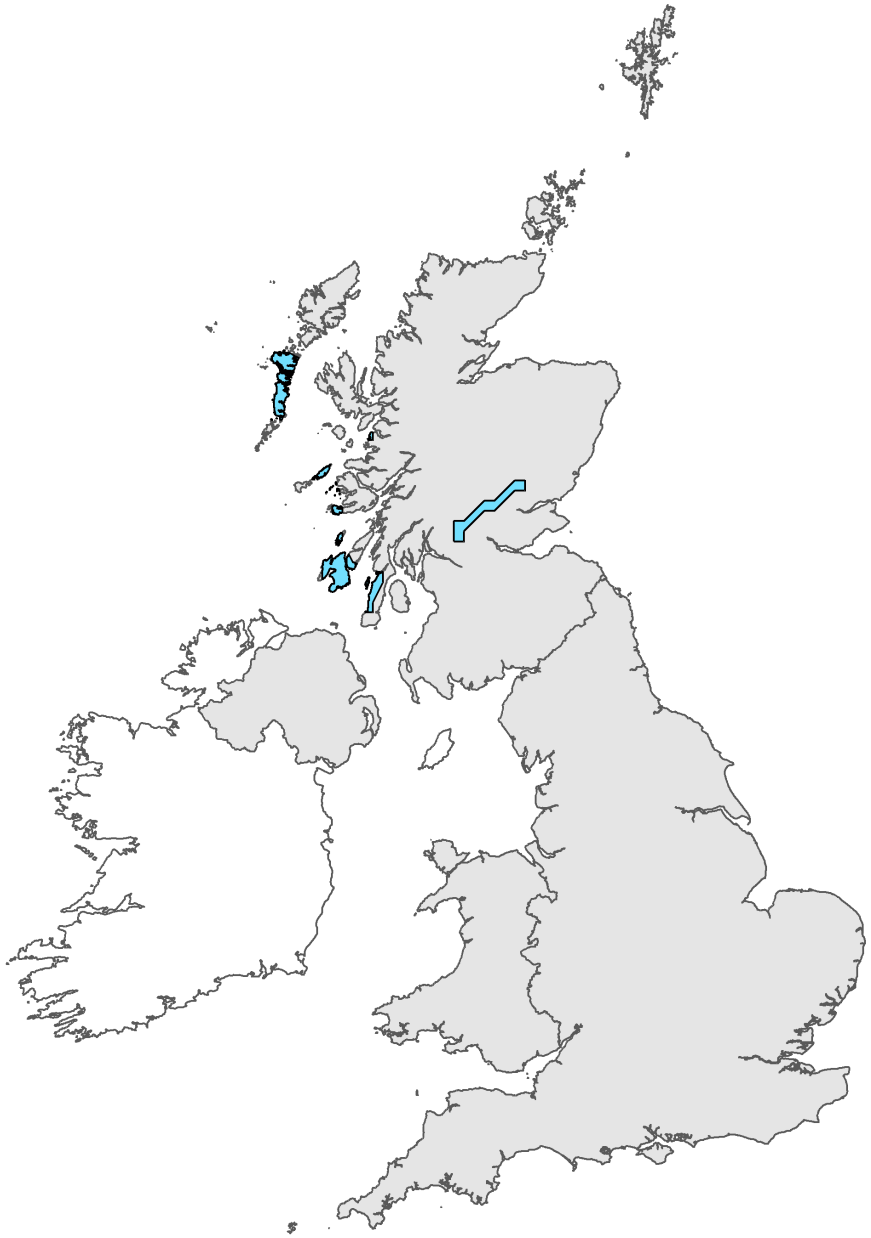

Figure 2: UK range map for S1833 - Slender naiad (*Najas flexilis*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: Najas flexilis (1833)

Field label	Note
2.1 Sensitive species	With no records in England since c1982 this unobtrusive species is not currently threatened by collection.
2.3 Distribution map	No records so map for England blank. The plant is no longer present at its single former English locality, Esthwaite Water, where it was last recorded in c1982.
2.4 Distribution map; Method used	The known site has been surveyed during the reporting round and sediment cores have been taken to search for a seed bank. Generally, Esthwaite Water has been intensively surveyed for its aquatic macrophytes so the plant can be confidently stated to have been lost from this site.

Species name: Najas flexilis (1833) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	There are no English records of the plant during the period covered by the Directive.
5.11 Change and reason for change in surface area of range	There are no English records of the plant during the period covered by the Directive so no change.
6.2 Population size	No records in English site since c1982.
6.6 Population size; Method used	Searched for and not found in the reporting round.
6.8 Short term trend; Direction	Remains stable on zero.
7.1 Sufficiency of area and quality of occupied habitat	The water quality at the single known (historic) English locality was too poor for this species of either mesotrophic or oligo-mesotrophic systems. The water quality has been improving since measures were put into place by NE, but it is still not believed to be good enough to support this species. Thus habitat quality is insufficient (rather than area). Whether there are other lakes in England that do have suitable habitat for this species is unknown, but is considered unlikely as it has never been recorded from other sites (which therefore are presumed not to have been suitable for it, although it might just never have reached them).
7.4 Short term trend; Direction	Water quality is slowly improving in Esthwaite Water but it will only be in the long term, if present trends continue, that it will be of sufficient quality for this species.
8.1 Characterisation of pressures/ threats	Water quality in the lake has suffered (eutrophication) from a combination of fish farm discharges, sewage works discharges and diffuse sources, all of which have been or are being tackled at this site. The last is probably now the main threat to water quality and is the most difficult to address, apart from the even more long term problem of accumulated nutrient in lake sediments, which can continue to release nutrient to the open water long after external loads have been reduced. More nutrient-rich conditions favour the non-native aquatic macrophyte Elodea nuttallii, which is present at the site. Elodea was still at 84% and 85 % abundance in wader and boat survey respectively in 2014 indicating there is a long way to go before the site is suitable for Najas flexilis again. Even in conditions that would be suitable for N. flexilis in terms of water quality, Elodea can persist and compete with N. flexilis. No current solution is known for this threat.

9.1 Status of measures	Natural England has bought out the fish farm, the fish farm cages have been removed and there is an agreed reduction of stocking of rainbow trout, to cease by 2013. United Utilities has re-built Hawkshead Waste-water treatment works to a higher standard so future discharges should be of much higher water quality. Natural England has also targeted the catchment for Higher Level Stewardship and Countryside Stewardship agreements with management options to reduce diffuse pollution. All these measures aim to improve the water quality.
9.4 Response to the measures	Sufficient improvement in water quality is a long-term objective.
9.5 List of main conservation measures	The attempt to remediate the lake with closure of the fish-farm and upgrades to the waste water handling and treatment (Maberly et al. 2011) and more recently cessation of fish stocking is having some effect; the concentration of total phosphate (TP) has continued to decline and secchi depth to improve very slightly. However, the mean concentration of phytoplankton chlorophll a in 2015 was 14 mg m-3 compared to 8 mg m-3 in 2010; most likely as a result of weather effects (Maberly et. al. 2015)
10.1 Future prospects of parameters	The attempt to remediate the lake with closure of the fish-farm and upgrades to the waste water handling and treatment (Maberly et al. 2011) and more recently cessation of fish stocking is having some effect; the concentration of total phosphate (TP) has continued to decline and secchi depth to improve very slightly. However, the mean concentration of phytoplankton chlorophll a in 2015 was 14 mg m-3 compared to 8 mg m-3 in 2010; most likely as a result of weather effects (Maberly et. al. 2015).
12.1 Population size inside the pSCIs, SCIs and SACs network	Not applicable - no SAC designated for this species as it has not been present in England since the Directive came into force.