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:

S6284 - Natterjack toad (*Epidalea calamita*)

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	**6284**
1.3 Species scientific name	**Epidalea calamita**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Natterjack toad

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

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

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

AMPHIBIAN AND REPTILE CONSERVATION TRUST 2011. Sand lizard and natterjack toad recovery project 2009-2011. CCW Contract Science Report 963, Countryside Council for Wales, Bangor.
BEEBEE, T & BUCKLEY, J 2001. Natterjack toad (Bufo calamita) Site Register for the UK 1970 -1999 inclusive. University of Sussex and The Herpetological Conservation Trust, UK.
BEEBEE, T & DENTON, J 1996. The natterjack toad conservation handbook. English Nature, Peterborough.
BRIG. 2007. A preliminary assessment of the implications of climate change for the implementation of UK BAP targets. Report to UK Biodiversity Partnership Standing Committee. (Draft).
CUNNINGHAM, AA & MINTING, P 2008. National survey of Batrochochytridium dendrobatridis infection in UK amphibians 2008. Final report, Institute of Zoology, London.
EDGAR, P 2007. The conservation status of the natterjack toad Bufo calamita and sand lizard Lacerta agilis in Wales. CCW Contract Science Report 788. Countryside Council for Wales, Bangor.
GLEED-OWEN, C, BUCKLEY, J, CONEYBEER, J, GENT, T, MCCRACKEN, M, MOULTON, N, & WRIGHT, D 2005. Costed plans and options for herpetofauna surveillance and monitoring. CCW Contract Science Report 666. Countryside Council for Wales, Bangor.
HERPETOLOGICAL CONSERVATION TRUST 2001. Sand lizard and natterjack toad recovery project 2000. CCW Contract Science Report 467. Countryside Council for Wales, Bangor.
HERPETOLOGICAL CONSERVATION TRUST 2003a Sand lizard and natterjack toad

recovery project 2002. CCW Contract Science Report 573. Countryside Council for Wales, Bangor.
HERPETOLOGICAL CONSERVATION TRUST 2003b. Database and geographical information system. CCW Contract Science Report 574. Countryside Council for Wales, Bangor.
HERPETOLOGICAL CONSERVATION TRUST 2005. Sand lizard and natterjack toad recovery project 2004. CCW Contract Science Report 665. Countryside Council for Wales, Bangor.
HERPETOLOGICAL CONSERVATION TRUST 2006. Sand lizard and natterjack toad recovery project 2005. CCW Contract Science Report 727. Countryside Council for Wales, Bangor.
HERPETOLOGICAL CONSERVATION TRUST 2007. Sand lizard and natterjack toad recovery project 2005-2006. CCW Contract Science Report 774. Countryside Council for Wales, Bangor.
HERPETOLOGICAL CONSERVATION TRUST 2009. Sand lizard and natterjack toad recovery project 2007-2009. CCW Contract Science Report 872. Countryside Council for Wales, Bangor.
MOULTON, N & BUCKLEY, J 2015. Sand lizard and natterjack toad recovery project 2011-2014. NRW Evidence Report. Report No.32. 23pp. Bangor.
ARC Data. Occupancy data for herpetofauna is based on data held internally by Amphibian and Reptile Conservation, combining a variety of data sources.

5. Range

5.1 Surface area (km²)		
5.2 Short-term trend Period		
5.3 Short-term trend Direction	Increasing (+)	
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	Genuine change The change is mainly due to:	Genuine change
5.12 Additional information		

6. Population

6.1 Year or period	2013-2018	
6.2 Population size (in reporting unit)	a) Unit b) Minimum	number of map 1x1 km grid cells (grids1x1)

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

	c) Maximum	
	d) Best single value	11
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	2007-2018	
6.8 Short-term trend Direction	Increasing (+)	
6.9 Short-term trend Magnitude	a) Minimum	83
	b) Maximum	83
	c) Confidence interval	
6.10 Short-term trend Method used	Complete survey or a statistically robust estimate	
6.11 Long-term trend Period	1989-2018	
6.12 Long-term trend Direction	Increasing (+)	
6.13 Long-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.14 Long-term trend Method used	Complete survey or a statistically robust estimate	
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	Genuine change Use of different method	
	The change is mainly due to:	Genuine change
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)?	Yes
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	
7.2 Sufficiency of area and quality of occupied habitat Method used	Complete survey or a statistically robust estimate	
7.3 Short-term trend Period	2007-2018	

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

7.4 Short-term trend Direction	Stable (0)
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
Extensive grazing or undergrazing by livestock (A10)	M
Interspecific relations (competition, predation, parasitism, pathogens) (L06)	M
Problematic native species (I04)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M

Threat	Ranking
Extensive grazing or undergrazing by livestock (A10)	M
Interspecific relations (competition, predation, parasitism, pathogens) (L06)	M
Problematic native species (I04)	M
Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)	M
Sea-level and wave exposure changes due to climate change (N04)	M
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M

8.2 Sources of information	
8.3 Additional information	

9. Conservation measures

9.1 Status of measures	a) Are measures needed?	No
	b) Indicate the status of measures	
9.2 Main purpose of the measures taken		
9.3 Location of the measures taken		
9.4 Response to the measures		
9.5 List of main conservation measures		

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

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	
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	

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

12.6 Additional information

13. Complementary information

13.1 Justification of % thresholds for trends

13.2 Trans-boundary assessment

13.3 Other relevant Information

Distribution Map

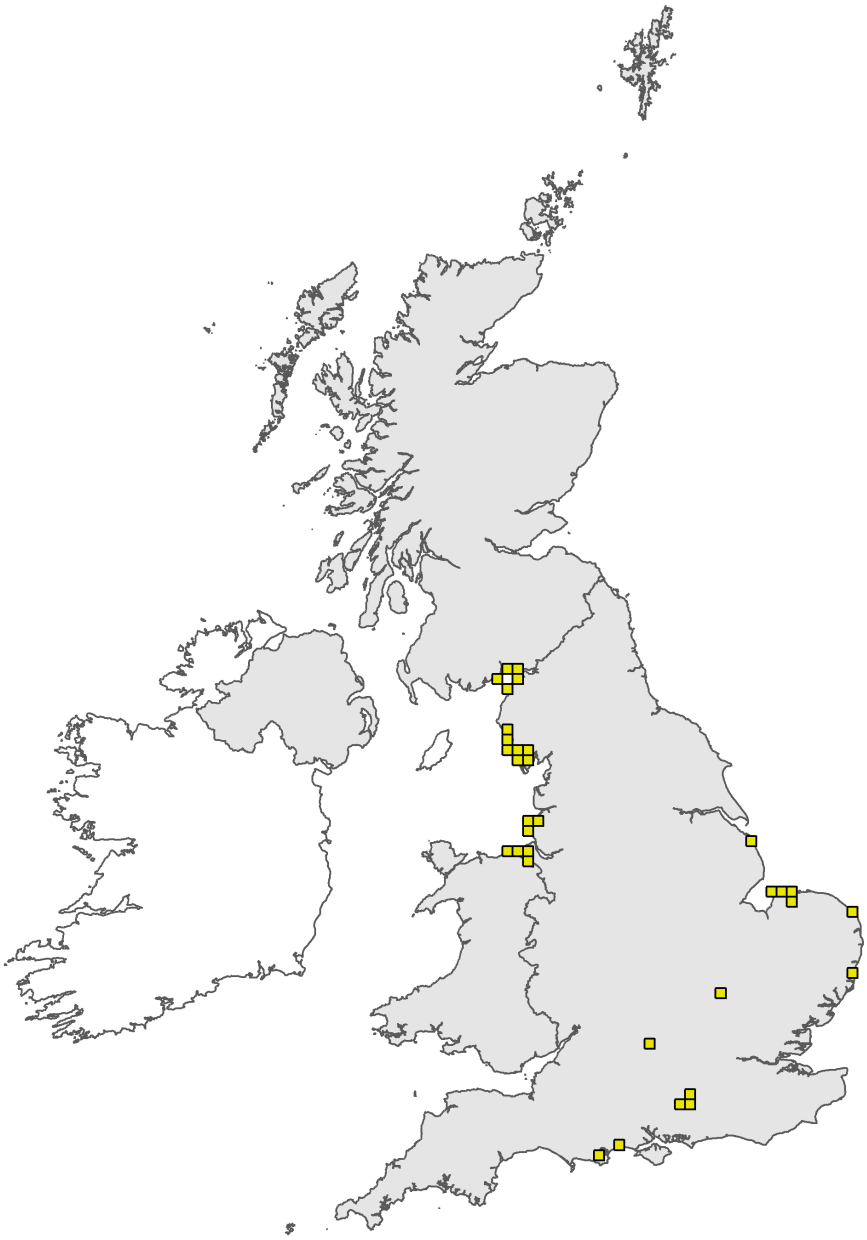

Figure 1: UK distribution map for S6284 - Natterjack toad (*Epidalea calamita*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

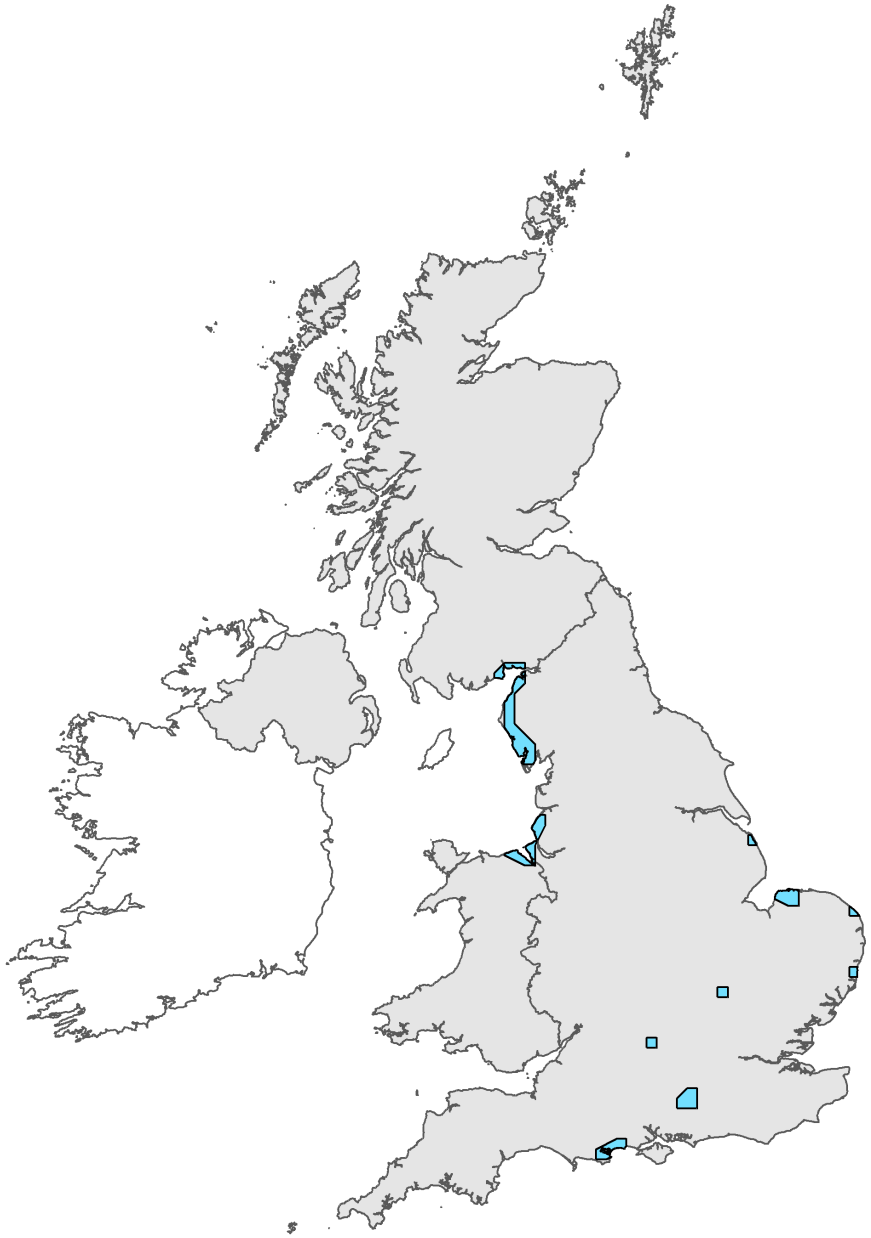

Figure 2: UK range map for S6284 - Natterjack toad (*Epidalea calamita*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: Epidalea calamita (6284) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	Within the Welsh part of the UK population, the range has been increasing due to re-introductions to new localities and spread/population growth within localities.
5.11 Change and reason for change in surface area of range	Within the Welsh part of the UK population, the range has been increasing due to re-introductions to new localities and spread/population growth within localities. From 1995 to 2003 they were present at Gronant and Talacre (Point of Ayr). In 2003 an intervening site was established at Presthaven. All three localities occupy two 10km squares (SJ08, SJ18). At the 1km level, the range had increased from an original four 1km squares (Gronant and Talacre) to six 1km squares (Gronant, Talacre and Presthaven) by 2013. Spawn was translocated to Bettisfield on the Dee Estuary coast (a third 10km square (SJ27) and a 7th 1km square in 2015, 2016 and 2017. Records are now available from a total of 11, 1 km squares. The map is based on the datasets held by Amphibian and Reptile Conservation Trust who were UKBAP lead partner for this species and who implement the re-introduction programme in Wales. All Welsh re-introduced sites are included in this 2018 report. Relevant data for all the report fields can be found in the following references listed at 4.2: Herpetological Conservation Trust 2003a, 2005, 2006, 2007 and 2009, Amphibian and Reptile Conservation 2011, Moulton and Buckley 2015. ARC Data. Occupancy data for herpetofauna is based on data held internally by Amphibian and Reptile Conservation, combining a variety of data sources.
6.2 Population size	Monitoring visits take place at each re-introduction site every spring (see HCT refs in 4.2 and ARC Data). Animals at each re-introduction site have dispersed to occupy suitable habitat in the vicinity of the release focal sites.
6.6 Population size; Method used	The entirety of each re-introduction site is surveyed every spring to record calling males and spawn strings, so any expansion to new 1km is recorded.
6.8 Short term trend; Direction	The populations in Wales are all re-introduced and another site has been included since 2013 so it is considered that the population in Wales is increasing. Animals are spreading out on each site to occupy any ponds created/managed for them and there are consequent increases in the number of spawn strings and emergent toadlets. Populations do fluctuate with variations in the extent and longevity of suitable water levels in breeding ponds, but spawn/tadpoles are rescued and transferred if water levels decline too soon (See HCT reports cited in 4.2).
6.9 Short term trend; Magnitude	The number of 1km squares in Wales increased from 6 in 2013 to 11 in 2018 all derived from re-introductions to suitable dune habitat (Bettisfield) or subsequent spread at old sites. This is a 83% increase over the period of 2013-2018. Data on re-introductions and spread within localities is available in the HCT refs cited in 4.2 and HCT 2003b and in the ARC Data.
6.11 Long term trend; Period	1989-2018 has been used as recommended. Natterjack toads were extinct in Wales in 1989. They were first re-introduced in 1995. The population has increased from 0 to 11 1km squares during the time period
6.12 Long term trend; Direction	This species was extinct in Wales until 1995 when it was first reintroduced to Wales as part of the Species Recovery Project and the UKBAP action plan. The population count is based on the NBN datasets provided by Amphibian and Reptile Conservation Trust who are UKBAP lead partner for this species and who implement the reintroduction programme in Wales. Relevant data for all of the report fields can be found in the references listed at 4.2: All natterjack toads in Wales are located solely in sand dune habitat.

6.16 Change and reason for change in population size	Due to re-introductions, the Welsh population (as measured by 1km squares) has increased during this time period from none in 1989 to 11 in 2018 with an increased amount of aquatic habitat available for reproduction on each site. (for data from surveillance see the HCT reports listed in 4.2). Note that the 2013 report used a different measure of population (breeding females) so this is being reported as a genuine change and using a different method.
6.17 Additional information	The reintroduced populations are breeding (male calling, spawning and juvenile emergents have been recorded) and sightings are spreading out from release points. This suggests that the population structure is normal and no deviation is taking place.
7.1 Sufficiency of area and quality of occupied habitat	Area Natterjack toads in Wales occur only in sand dune habitat. They occupy a fairly narrow area of sand dune, restricted on the landward side by roads and development. There is thought to be a sufficient amount of habitat in Wales to support a viable population of the species. Quality The overall site management at the re-introduced localities is suitable for natterjack toads. Ponds are managed to remove common toad invasion, scrub is controlled to prevent attracting common toads and to provide the open short turf swards for natterjack foraging. However as at all Welsh dune systems there is an issue of dune stabilisation due to reduced sand availability and possible enrichment from aerial nitrogen. These sites are not grazed by stock and future management may include interventions to increase dune mobility for a range of dune taxa. The dune systems themselves are also restricted physically by landward infrastructure (roads/rail, golf course and caravan sites/houses) . See Beebee & Denton, 1996.
7.2 Sufficiency of area and quality of occupied habitat; Method used	The annual monitoring of re-introduction sites (see HCT references in section 4.2) delivers information on the numbers of breeding ponds, calling males, the number of spawn strings produced and the aquatic and terrestrial management work that has taken place at each site. Aquatic habitat for the species has increased in quantity and quality at the re-introduction sites due to active management. Terrestrial habitat whilst being actively managed to control scrub, is also impacted by the general problem of stabilisation. There are, however, no empirical assessments of terrestrial habitat quality and this is judged by the HCT/ARC project manager at each site using expert knowledge.
7.4 Short term trend; Direction	Stable: Whilst the number of reintroductions and thus the area of habitat occupied has increased, the actual amount of habitat available has not changed (Edgar, 2007 and see refs cited in 4.2). The sand dune habitat occupied by natterjack toads is being managed so quality of habitat should be improving and there is no need to provide extra habitat
7.5 Short term trend; Method used	The extrapolation is used here because it is not empirically known exactly how much of the available terrestrial habitat the toads on each reintroduced site are using, whilst it is easy to record their use of breeding ponds (see HCT refs in 4.2.).

8.1 Characterisation of pressures/ threats

Pressures: These pressures all relate to Welsh natterjack sites and can mostly be referenced to evidence in Beebee and Denton (1996). A10: relates to undergrazing (often the product of extensive grazing regimes) leads to dominance of marram and lack of bare sand. Rabbits are important grazers on most sites. This can lead to habitat fragmentation as dune stabilisation makes habitat unsuitable resulting in isolated populations in a fragmented habitat. L06: this broad category includes interspecific predation/disease. This relates to direct predation of eggs and larvae by invertebrates and fish and competition from common toad tadpoles. The latter has been a pressure at Talacre Warren where other more suitable ponds have been created to attract common toads. It also applies to animal disease which could impact on rabbits (myxomatosis, rabbit haemorrhagic disease) that maintain some short sward areas. The presence of Chytrid fungus has been confirmed at Welsh natterjack sites (Cunningham & Minting, 2008), but as yet there do not appear to be any detrimental effects on the population. I04: refers to the deliberate or accidental introduction of fish to natterjack aquatic habitats. Some fish act as predators of natterjack eggs and larvae (e.g. rudd) whilst others may assist natterjack survival by removing invertebrate predators, frog and common toad tadpoles. (Beebee and Denton, 1996). L02: relates to scrub encroachment on aquatic and terrestrial habitats; colonisation leads to siltation and drying out of breeding ponds. J01: pollution to surface waters- refers to the impact of run off from adjacent land on the aquatic habitat causing enrichment and more rapid succession of vegetation in the ponds and also the impact of nitrogen on dune stabilisation, soil development and scrub growth. J01 is considered a low pressures and consequently not formally reported in line with JNCC guidance. Threats: These threats all relate to Welsh natterjack sites A10: undergrazing - the Welsh reintroduction sites currently have no stock grazing, relying on rabbits to maintain short, open swards. None of the sites are part of agricultural systems, being adjacent to caravan parks, etc, but it is hoped that grazing could be restored. However, bovine TB and the ability of graziers to provide livestock make this a continuing threat. L06: this threat includes interspecific predation/disease. This relates to direct predation of eggs and larvae by invertebrates and fish and competition from common toad tadpoles. The latter has been a pressure at Talacre Warren where other more suitable ponds have been created to attract common toads. It also applies to animal disease which could impact on rabbits (myxomatosis, rabbit haemorrhagic disease) that maintain some short sward areas. The presence of Chytrid fungus has been confirmed at Welsh natterjack sites (Cunningham & Minting, 2008), but as yet there do not appear to be any detrimental effects on the population. I04: refers to the continuing threat of deliberate or accidental introduction of fish to natterjack aquatic habitats. Some fish act as predators of natterjack eggs and larvae (e.g. rudd) whilst others may assist natterjack survival by removing invertebrate predators, frog and common toad tadpoles. (Beebee and Denton, 1996). L02: relates to the continuing threat of scrub encroachment on aquatic and terrestrial habitats which leads to siltation and drying out. NO4: there are threats from climate change impacts on coastal vertebrates which include increased storminess leading to beach erosion or other weather changes that may impact the availability of suitable breeding pools or terrestrial habitat due to sand loss or re-profiling (See Brig, 2007 for discussion of risk to habitat of natterjack toad- the species itself was not selected for this study). NO1: this refers to the threat of climate change impacts on temperature and water levels which could reduce the amount of and duration of water levels in breeding ponds via water table or rainfall impacts. J01: pollution to surface waters- refers to the impact of run off from adjacent land on the aquatic habitat causing enrichment and more rapid succession of vegetation in the ponds and also the impact of nitrogen on dune stabilisation, soil development and scrub growth. FO8: sea defences- there are continuing demands on the coastline of north Wales for the development of further port facilities and protection along the coast of the Dee Estuary, where new re-introductions are proposed. Changes to coastal process threaten natterjack toad habitat. J01 & F08 were considered low threats and consequently not

	formally reported in line with JNCC guidance.
10.1 Future prospects of parameters	The production of a strategy for future plans for re-introduction sites along the Dee Estuary may result in new locations being identified as being suitable for natterjack toad re-introductions, thus extending the range in Wales, however this is not yet certain so overall stable has been reported.