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:

S1358 - Polecat (*Mustela putorius*)

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	**1358**
1.3 Species scientific name	**Mustela putorius**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Polecat

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1995-2016
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

Birks, JDS. 2008. The polecat survey of Britain 2004-2006. Vincent Wildlife Trust, Ledbury
Birks, JDS. 2015. Polecats. Whittet Books Ltd.
Birks J, Kitchener A. 1999. Ecology of the polecat in lowland England. The distribution and status of the polecat Mustela putorius in Britain in the 1990s. London.
Costa M, Fernandes C, Birks JDS, Kitchener AC, Santos-Reis M, & Bruford MW. 2013.The genetic legacy of the 19th-century decline of the British polecat: evidence for extensive introgression from feral ferrets. Molecular Ecology, 22, 5130-5147.
Croose E. 2016. The distribution and status of the polecat (Mustela putorius) in Britain 2014-2015. The Vincent Wildlife Trust.
Langley PJW & Yalden DW. 1977. The decline of the rarer carnivores in Great Britain during the nineteenth century. Mammal Review 7: 95-116.
Mathews F, Kubasiewicz LM, Gurnell J, Harrower C, McDonald RA, Shore RF. 2018. A review of the population and conservation status of British Mammals. A report by The Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough. ISBN 978-1-78354-494-3.
Sainsbury KA, Shore RF, Schofield H, Croose E, Pereira MG, Sleep D, Kitchener AC, Hantke G, McDonald RA. 2018. Long-term increase in secondary exposure to anticoagulant rodenticides in European polecats Mustela putorius in Great Britain. Environmental Pollution 236: 689-698.

5. Range

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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	Use of different method The change is mainly due to:	Use of different method
5.12 Additional information		

6. Population

6.1 Year or period	1995-2016	
6.2 Population size (in reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	13700
	c) Maximum	20000
	d) Best single value	16800
6.3 Type of estimate	95% confidence interval	
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	2004-2016	
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	Based mainly on expert opinion with very limited data	
6.11 Long-term trend Period	1997-2016	
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	Based mainly on expert opinion with very limited 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	Improved knowledge/more accurate data Use of different method The change is mainly due to: Use of different method
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	Based mainly on extrapolation from a limited amount of data	
7.3 Short-term trend Period	2004-2015	
7.4 Short-term trend Direction	Stable (0)	
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
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M
Use of other pest control methods in agriculture (excluding tillage) (A23)	M
Illegal shooting/killing (G10)	M
Bycatch and incidental killing (due to fishing and hunting activities) (G12)	M
Poisoning of animals (excluding lead poisoning) (G13)	H

Other invasive alien species (other then species of Union concern) (I02)	M

Threat	Ranking
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M
Use of other pest control methods in agriculture (excluding tillage) (A23)	M
Illegal shooting/killing (G10)	M
Bycatch and incidental killing (due to fishing and hunting activities) (G12)	M
Poisoning of animals (excluding lead poisoning) (G13)	H
Other invasive alien species (other then species of Union concern) (I02)	M
Absence or reduction of interspecific faunal and floral relations (e.g. pollinators) (L07)	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

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

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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	
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

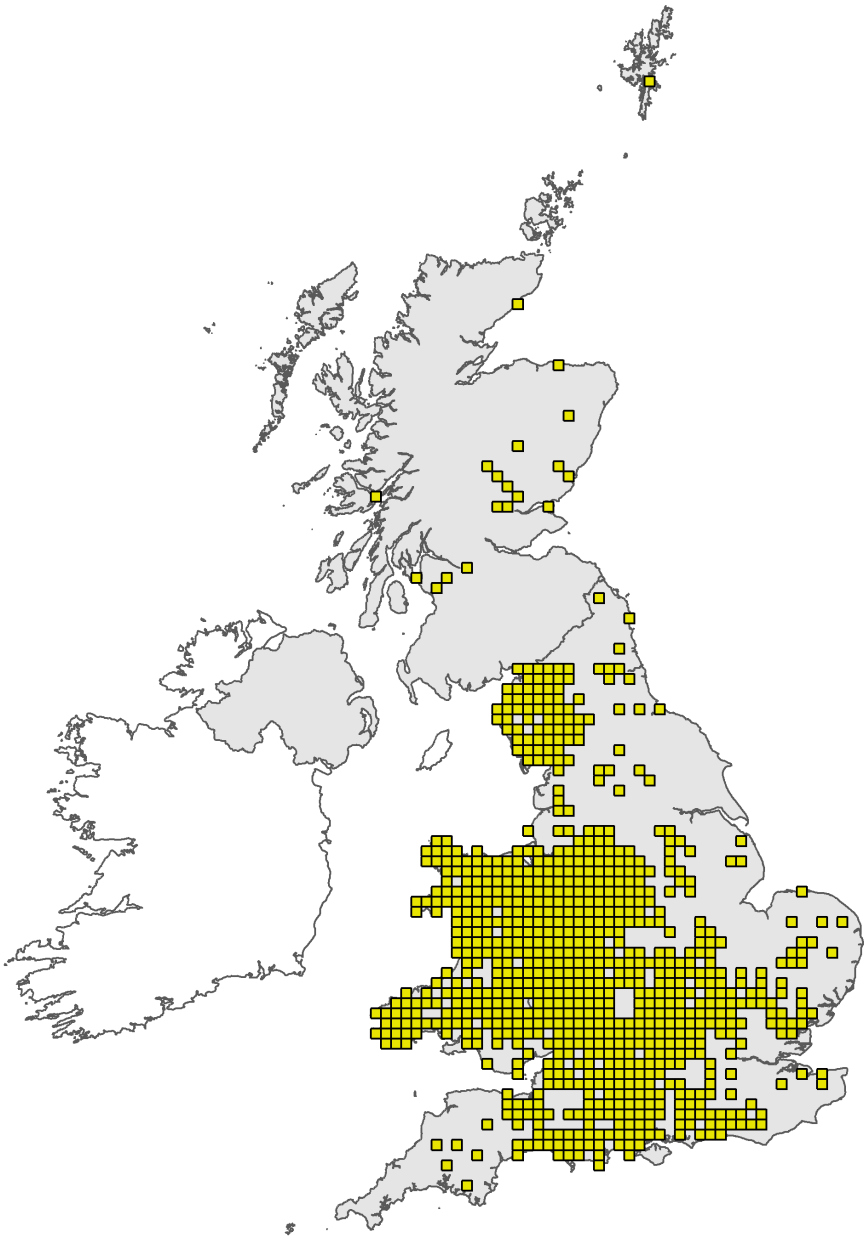

Figure 1: UK distribution map for S1358 - Polecat (*Mustela putorius*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

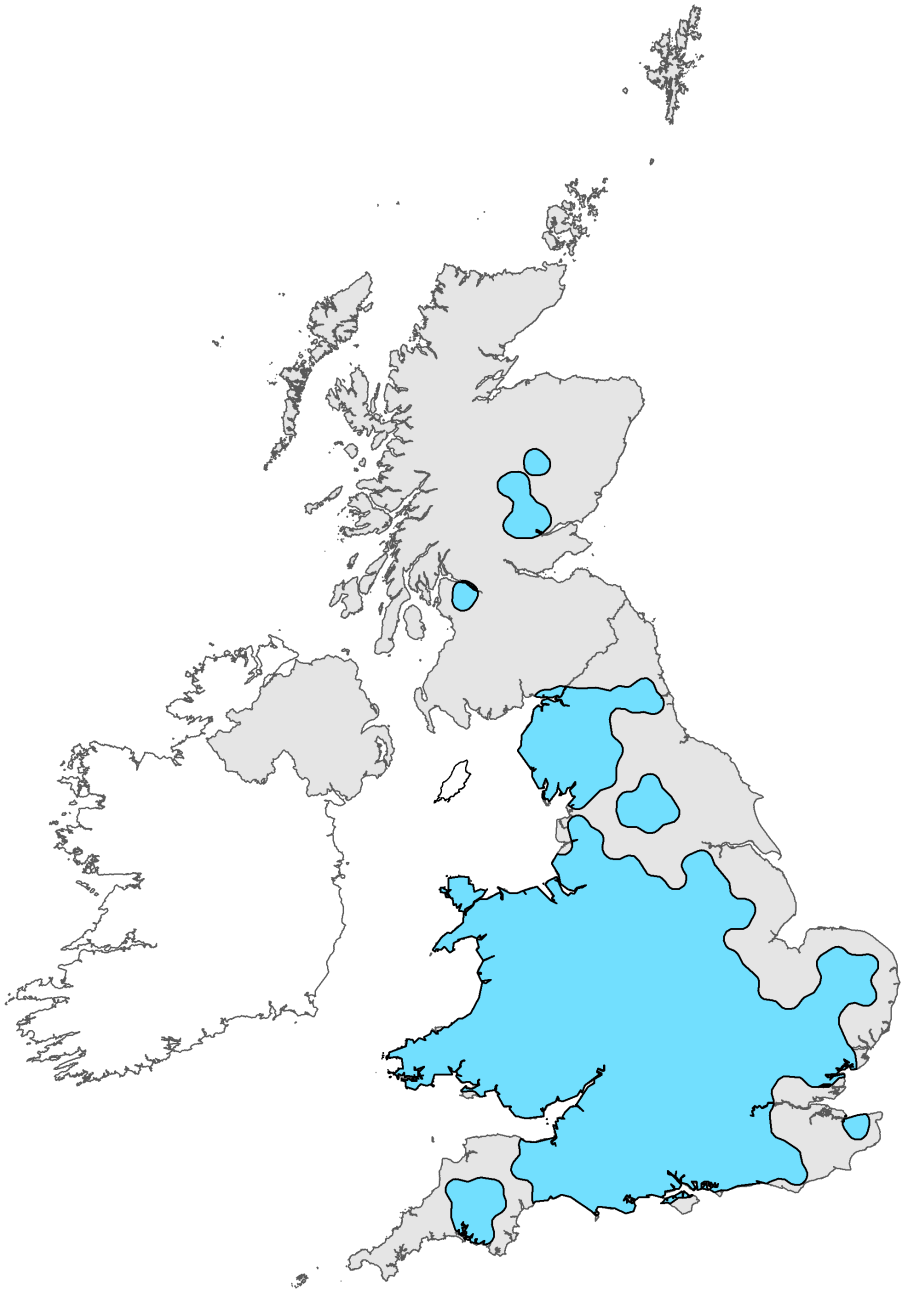

Figure 2: UK range map for S1358 - Polecat (*Mustela putorius*).Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by The Mammal Society applying a range mapping tool as outlined in Matthews et al. (2018), 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: Mustela putorius (1358)

Field label	Note
2.4 Distribution map; Method used	Shape files supplied by The Mammal Society: Mathews F, Kubasiewicz LM, Gurnell J, Harrower C, McDonald RA, Shore RF. 2018. A review of the population and conservation status of British Mammals. A report by The Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough. ISBN 978-1-78354-494-3.

Species name: Mustela putorius (1358) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	Polecat range in Wales was complete in the 2013 reporting round, and there has been no significant change. See 5.11
5.10 Favourable reference range	5.10 a) Favourable reference range Area (km2) To be set by JNCC 5.10 d) Method used Range is based on presence data collected between 1995-2016. Areas that contain very isolated records may not have been included in the area of distribution. The range has been taken from Mathews et al. (2018), whereby an alpha hull value of 20km was drawn around the presence records, which represented the best balance between the inclusion of unoccupied sites (i.e. where records are sparse but close enough for inclusion) and the exclusion of occupied areas due to gaps in the data (i.e. where records exist but are too isolated for inclusion). An additional 10km buffer was added to the final hull polygon to provide smoothing to the hull and to ensure that the hull covered the areas recorded rather than intersecting them. This differs from the approach taken in 2013 and 2007 whereby a 45km alpha hull value was used with a starting range unit of individual 10km squares. The new method has led to much finer detailed maps being produced underpinned by data gathered at a much finer resolution, leading to the production of a more accurate FRR. Given the ability to produce finer detailed maps, in agreement with JNCC, a revised FRR was assigned based on the current range. See 5.11 for explanation re current range. Note that FRR was only available at the UK level and not for Wales in previous reporting rounds.
5.11 Change and reason for change in surface area of range	The mapped range of polecat in Wales given during the 2013 reporting round encompassed virtually the whole of mainland Wales and Anglesey, equivalent to 20,643 km2. The range calculated by Mathews et al. (2018) is 20,552 km2, a reduction of 91km2 arising from a small area of the Gower peninsular being excluded from the mapped polecat range. This is a result of the mapping method used by Mathews et al. 2018 which led to much finer detail maps being produced (see 5.10d). The Vincent Wildlife Trust survey of 2014-15 concluded that polecat's range in Wales had been maintained since their previous survey of 2004-2006 (Croose 2016). There were some hectads where polecats were not recorded, but this was thought to be due to under-recording rather than gaps in range.
6.2 Population size	Wales: a) Unit = individuals b) Minimum = 13,700 c) Maximum = 20,000 d) Best single value = 16,800 (95% CIs 13,700 - 20,000).

6.6 Population size; Method used	Population estimate from Mathews et al. (2018). Method utilised to estimate population size was to multiply habitat-specific density estimates by the extent of these habitats within the geographical range. Where multiple estimates were available, the median value was used to produce the 'best' estimate, and 95% confidence intervals were created. Where possible, population sizes were adjusted to account for the percentage of occupied habitat within the species' range. Occupancy data were only included where studies used standardised surveys and reported both presence and absence. In the absence of data on percentage occupancy, 100% was assumed. As a generalist species, polecat population density estimates in the literature are not habitat-specific. Population sizes were therefore calculated by multiplying the population density by the total area of the species' distribution, with urban areas removed. Occupancy data was taken from Birks & Kitchener (1999). The risk of over-representation of polecat range due to confusion with polecat-ferrets is small in Wales due to the high (>95%) verification of records as true polecats (Croose 2016).
6.10 Short term trend; Method used	In the 1990s Birks & Kitchener (1999) established a polecat monitoring system to determine population density estimates using co-ordinated live-trapping by volunteers in 136 1km squares within the species' range at that time. These data were used to derive winter population density estimates for the 'current core' polecat range (101 animals per 10-km square) and for the 'current fringe' (69 animals per 10-km square). These density estimates were used with the results of the distribution survey to calculate the total population size in 1997, which was estimated to be 17,691 in Wales (Birks & Kitchener 1999). This estimate was updated using the range data from the 2004-2006 survey to take into account the expansion of the polecat's range. The polecat's population size in Wales was estimated to be 18,448, an increase of 4.3% since 1997 (Birks, 2008 - table 5.14). The current population estimate for polecats in Wales is 16,800 (Mathews et al. 2018). When compared to the 2004-06 estimate of 18,448 this represents an 8.9% decrease. However, whilst both Birks (2008) and Mathews et al. (2018) have utilised the Birks & Kitchener (1999) density estimates to calculate population size, they have been applied in a different manner and it is therefore not possible to make a meaningful comparison between the two estimates. Polecat range in Wales has remained stable and there is no other evidence to suggest declines in polecat density, and therefore it is presumed that population size has remained stable.
6.12 Long term trend; Direction	Differences in methodologies for calculating population size in Wales mean that it is not possile to calculate long term trend in population size (Birks & Kitchener 1999, Birks 2008, Mathews et al. 2018). However, the complete recovery of the polecat's range in Wales since the 1930s (Langley & Yalden 1977) and it's ongoing expansion in England (Croose 2016,) indicates that in the long term the population has increased.
6.16 Change and reason for change in population size	Population size of polecats in Wales in 2004-06 was estimated to be 18,448 (Birks 2008) and the current population estimate is 16,800 (Mathews et al. 2018), equivalent to an 8.9% decrease. However, different methodologies have been used to determine the two estimates and therefore it is not possible to make a meaningful comparison between the reporting periods. Polecat range in Wales has remained stable and there is no other evidence to suggest declines in polecat density, and therefore it is presumed that population size has remained stable. See 6.10.
6.17 Additional information	This information corresponds to section 6.18 in the evidence pack: Comprehensive data on the current age structure, mortality and reproduction of the polecat population in Wales is not available, however its range and population size appear to be stable and there is no reason to conclude that these other population parameters deviate significantly from the norm.

7.1 Sufficiency of area and quality of occupied habitat	The polecat occupies a wide range of habitats, with a general association with lowlands. A radio-tracking study (Birks & Kitchener, 1999) found that woodland edges, field boundaries and farm buildings were preferred habitats, with open fields and suburban areas least favoured; farm buildings were most used during winter months. Unlike elsewhere in Europe, polecats in Britain do not show a preference for riparian habitats and this is likely to be due to the avoidance of competition with mink and due to the abundance of rabbits throughout their range which provides a source of food away from riparian habitats (Birks, 2015). Mathews et al. (2018) estimated the area of suitable habitat in Wales to be 19,800 km2.
7.2 Sufficiency of area and quality of occupied habitat; Method used	Given the generalist nature of polecat habitat use, Mathews et al. (2018) calculated suitable habitat to be total range size minus the area of urban and gardens.
7.5 Short term trend; Method used	An analysis of the short term trends of polecat habitat was not possible, but the generalist nature of the polecat's habitat use and the stable polecat range since the last reporting indicates that occupied habitat is also stable.
8.1 Characterisation of pressures/ threats	Pressures: Polecat populations are still subject to significant pressures which could affect numbers. Although the polecat is found in a wide range of habitats, it has a clear association with hedges and woodland edges and avoids open habitats (Birks & Kitchener, 1999, Birks 2015). Removal of such features affects availability of suitable habitat (A05). Polecats are vulnerable to secondary poisoning by rodenticides with lethal and sub-lethal effects (A23, G13, Birks 2015). A recent study of road-kill polecats found second generation anti-coagulant rodenticides to be present in 71% of animals tested, representing a 1.7-fold increase in the rate of detection over the previous 25 years (Sainsbury et al. 2018). Illegal persecution (G10) and accidental trapping (G12) still represent a risk to polecats. Croose (2016) reported several incidents of polecats killed or injured in Fenn and cage traps. Hybridisation with feral ferrets Mustela furo (I02) remains an issue, although a study found that true polecats were found most frequently in Wales and hybrids were most frequent outside Wales (Costa et al. 2013) and Croose (2016). Polecats remain at risk from road traffic accidents (E01), but the rate of mortality does not appear to be affecting populations. Threats: Polecat populations are likely to continue to be subject to the same pressures described above. In Wales, the risk of secondary poisoning may represent the greatest threat. This risk may be exacerbated by an apparent decline in rabbit populations (Croose 2016, Mathews et al. 2018), the main prey of the polecat, which could result in polecats consuming more rats (L07) thereby increasing their risk of exposure.