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Mustela putorius, Western Polecat

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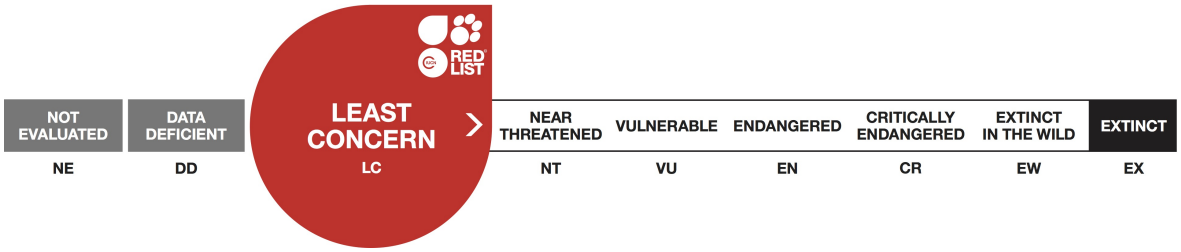

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Mustelidae

Taxon Name: *Mustela putorius* Linnaeus, 1758

Regional Assessments:

- Mediterranean
- Europe

Common Name(s):

- English: Western Polecat, European Polecat
- French: Putois d'Europe
- Spanish: Turón

Taxonomic Notes:

Some authors (e.g., Pocock 1936, Ellerman and Morrison-Scott 1951) considered that *Mustela putorius* and Steppe Polecat *M. eversmanii* are conspecific, but most recognised these two taxa as closely related but distinct species (e.g. Heptner *et al*. 1967, Abramov 2000, Wozencraft 2005). Recent molecular studies support this point of view (Davison *et al*. 1999, Kurose *et al*. 2000, Koepfli *et al*. 2008). *Mustela putorius* is the probable ancestor of Domestic Ferret *M. furo*; this latter is often known as *M. p. furo*. The origin of the North African population allied to this species has been debated. Some authors contend that it is a feral population of Domestic Ferret, although fossil remains found in 2001 and ascribed to *M. putorius* suggest that the species might be native to North Africa (see Gippoliti 2011, Ahmim 2013, Griffiths and Cuzin 2013 and references therein). Much information published under the name *M. putorius* refers specifically to *M. furo*; for example, only this latter has been introduced to New Zealand (Clapperton 2001).

Assessment Information

Red List Category & Criteria: Least Concern ver 3.1

Year Published: 2016

Date Assessed: March 5, 2016

Justification:

Western Polecat is listed as Least Concern in view of its wide distribution, large population, and because it is unlikely to be declining at the rate required to qualify for listing in a threatened category or even as Near Threatened. The confidence of this assessment is low, given the paucity of recent precise and accurate information on population trend across most of its range. The geographic range and population (not known, but as inferred under a reasonable population density) are both well in excess of what would be required for the species to be listed as even Near Threatened on those grounds. However, the situation is less clear with population trend. As a species living largely in landscapes dominated by farming and other human endeavour, it is difficult to infer population trend from gross patterns of habitat change; changes in farming style and other human activities are likely to have much larger

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effects. There is evidence of recent strong decline in Saxony-Anhalt, Germany (A. Weber *pers. comm.* 2015) and of decline in various other parts of western Europe (see 'Population' section) and it seems likely that the species is declining across much of this region. However, in some areas, such as Britain and Switzerland, populations which had shown heavy declines in the past are now rebounding. Europe west of the former 'Iron Curtain' accounts for only about a quarter of Western Polecat range, and in the remaining three-quarters the general opinion is of population stability. Moreover, population densities in this latter area are believed to be substantially higher than in Western Europe. If all this information is accurate, the overall global population trend seems unlikely to reach the rate of about 20% decline per 13-14 years (three generations) that would make a Near Threatened categorisation appropriate, despite the drastic situation in parts of western Europe.

The North African populations of disputed origin and taxonomic identity, either part of or close to this species, are poorly known but seem to be extremely rare and threatened (Gippoliti 2011, Ahmim 2013, Griffiths and Cuzin 2013); however, they comprise such a small proportion of the global population that they do not affect the Red List categorisation for the species as a whole.

Previously Published Red List Assessments

2008 – Least Concern (LC) – http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41658A10501394.en

1996 – Lower Risk/least concern (LR/lc)

Geographic Range

Range Description:

Western Polecat is widespread in the western Palaearctic east to the Ural Mountains in the Russian Federation; it is absent from Ireland, northern Scandinavia, much of the Balkans, much of the eastern Adriatic coast, and occurs in Greece only marginally, in the north. It is widespread in France, less so in the south-west and south-east (Berzins and Ruette 2014, Calenge *et al*. 2015), in mainland Spain (Grupo de carnívoros terrestres de la SECEM 2001, Virgós 2007), in Romania (A.D. Sandor *pers. comm.* 2015) and in many other countries of its range. Since the year 2000 many distribution gaps in the Swiss Midlands and Jura have been filled and in the Grisons the species has expanded its range in the Vorderrhein Valley to almost the Oberalp Pass, and in the Vorderrhein Valley to the Via Mala area (Infofauna 2016).

There is some evidence of northern range expansion recently (references cited in Zabala *et al*. 2005, T. Maran *pers. comm.* 2016). The north-eastern border of regular occurrence runs approximately to Arkhangelsk city, Syktyvkar city and Perm city (Russia); north and east of this line, it is very rare, being replaced over the River Kama by its ecological analogue, Siberian Weasel *M. sibirica*; wild hybrids between the two, from west of the Kama, are known (D. Skumatov *pers. comm.* 2015). It has recently been recorded at Cherdyn' (Perm province) at about 60°30'N, 57°E (S. Glebov per D. Skumatov *pers. comm.* 2016). Western Polecat inhabits the west slope of the Middle and South Urals; recent occurrence east of the Urals (up to Kurgan city) is possible, but not proven. The species inhabits the forest-steppe zone from the southern Urals to the River Volga, River Don and the Azov Sea. To the south occurs Steppe Polecat *M. eversmanii*; hybridisation occurs (Ternovski and Ternovskaya 1994).

Populations of disputed taxonomic identity that are either part of, or close to, this species are found in

North Africa, in the Moroccan Rif Mountains (Griffiths and Cuzin 2013) and in adjacent Algeria (Ahmim 2013). The feral range of the Domestic Ferret *Mustela furo* includes some areas within Western Polecat's native range (e.g. Britain) and some outside it such as New Zealand (Clapperton 2001).

In Europe, Western Polecat has been recorded from sea-level up to at least 1,600 m a.s.l. in Spain (Virgós 2007) and up to 1,400 m for the French Pyrenees (C. Arthur *pers. comm.* 2016) and 1,500 m for the French Alps (P. Rigaux *pers. comm.* 2016); previous statements of occurrence up to 2,000 m a.s.l. in France remain to be corroborated, although in Switzerland there are recent records at altitudes probably above 1900 a.s.l. (P. Dollinger *pers. comm.* 2016). The African populations occur from sea level to 2,400 m (Griffiths and Cuzin 2013).

Country Occurrence:

Native: Albania; Andorra; Austria; Belarus; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; Czech Republic; Denmark; Estonia; Finland; France; Germany; Gibraltar; Greece; Hungary; Italy; Latvia; Liechtenstein; Lithuania; Luxembourg; Macedonia, the former Yugoslav Republic of; Moldova; Montenegro; Netherlands; Norway; Poland; Portugal; Romania; Russian Federation; Serbia (Serbia); Slovakia; Slovenia; Spain; Sweden; Switzerland; Turkey; Ukraine; United Kingdom

Present - origin uncertain: Algeria; Morocco

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Distribution Map

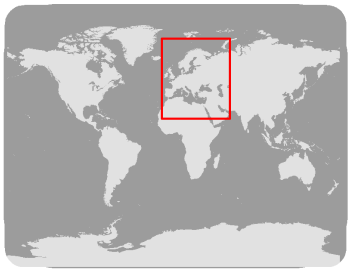
Mustela putorius

NE | DD | LC LEAST CONCERN | NT | VU | EN | CR | EW | EX

Range

Extant (resident)

Compiled by:
IUCN (International Union for Conservation of Nature)



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

In general the Western Polecat population is believed to be large and relatively stable in the eastern half to three-quarters of its range. Considerations of population trend must take into account that it loses more than half its population from autumn to spring annually (D. Skumatov *pers. comm.* 2016). It is common in forested areas of European Russia, where the population density is about one individual per km² in winter in the southern taiga zone from the Belarus border in the west to Izhevsk city in the east (D. Skumatov *pers. comm.* 2015). There is no precise information on population trend in the country. It is not a focus of the state hunting monitoring; information is collected only incidentally to the main species for monitoring and the hunting bag is not recorded (D. Skumatov *pers. comm.* 2015). However, over its large range in the Russian Federation, which comprises a large proportion of the species' entire global range, annual official monitoring of wildlife by snow-tracking suggests that it is relatively stable, perhaps with some decline (but much less than 20%) since 2000 (A. Saveljev *pers. comm.* 2015, D. Skumatov *pers. comm.* 2015). Based on hunters' opinions, the population is stable or increasing in Estonia (T. Maran *pers. comm.* 2015). In Latvia the population is widespread and healthy, although the species is possibly being displaced from some areas around human settlement by Beech Marten *Martes foina* (J. Ozolins *pers. comm.* 2015). By contrast, in Belarus, the species is believed to be in decline, and recent surveys in Naliboki Forest and its rural surroundings found only 4.7-8.3 individuals per 100 km² (Sidorovich 2011, V.E. Sidorovich *pers. comm.* 2016).

Similarly, further south, in Romania, 2007/2008 – 2011/2012 hunting bag statistics and 2005–2013 population estimates (source: Ministry of Environment and Climate Change, www.mmediu.ro, accessed on 12 October 2014), for which there is no previous comparison period, converge in suggesting a 22–25% decline during the 14 years to 2013; notably, the hunting quota did not decline during 2007/2008 – 2011/2012, so the drop in number taken was not driven by a change in regulation (A.D. Sandor *pers. comm.* 2015). Although the Polecat is considered by the public (game-keepers, scientists and lay public) to be the most common mustelid in Romania, a 2012–2014 transect survey for tracks focused on the centre and west of the country recorded it in only 54.25% of transects comprising apparently suitable habitat (compared with 65.57% for Pine Marten *Martes martes*, 76.12% for Wild Cat *Felis sylvestris* and 91.50% for Eurasian Otter *Lutra lutra*) (A.D. Sandor *pers. comm.* 2015).

In Western Europe, the species is scarce, typically occurring at densities of about 1 individual per 10 km², and rarely exceeding 5–10 individuals per 10 km², even in optimal habitat. In the United Kingdom numbers are now increasing, following a major persecution-driven decline from the 1800s to 1920s (Davison *et al*. 1999), although there is a significant degree of introgression with Domestic Ferret *M. furo* (Costa *et al*. 2013). In France the species' conservation status was assessed in 2007 (2002–2006) and in 2013 (2007–2012): it was 'Unfavourable – Inadequate' in 2013 versus 'Unknown' in 2007 in two biogeographic regions (Alpine and Mediterranean), but the improvement of knowledge allowed assessment as 'Favourable' in the two other regions (Atlantic and Continental). Its range dropped from 11,263 to 3,300 km² in the Alpine region and from 37,199 to 15,600 km² in the Mediterranean region between 2007 and 2013; the total French distribution area was 465,680 km² in 2007 but only 334,300 in 2013 (Bensettiti and Puissauve 2015). A modelling approach intending to account for the search effort predicted a probable decrease in Polecat numbers in 30% of the French agricultural regions whereas an increase was probable in 20% of them (Calenge *et al*. 2016, in press). The southern French population has presumably decreased in line with this range contraction although no precise number exist. In Switzerland, a massive decline took place until the late 1970s but since then the population has

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stabilised and even, locally (in the Grisons) increased (Hausser 1995, Anderegg 2004); road-kill statistics show a huge, sustained increase in reported Polecats between 2009 and 2014 (from 2 to 153), an increase mirrored in such observation of few other species, and thus more likely to reflect an increasing Polecat population than changed reporting behaviour (P. Dollinger *pers. comm.* 2016).

In Spain it seems to live at generally low densities (J. Herrero *pers. comm.* 2015). Widespread declines are believed to be occurring in the Mediterranean climatic zones of Spain and Portugal, probably associated with use of pesticides but also reflecting the reduction of the European Rabbit *Oryctolagus cuniculus* population, but no quantitative data exist (E.J. Virgós *pers. comm.* 2015; I. Zuberogoitia *pers. comm.* 2015); the species is very much in the 'attention-shadow' of the larger carnivores. Intensive control programmes for American Mink *Neovison vison* in northern Spain reveal that the Polecat is now very scarce there (I. Zuberogoitia *pers. comm.* 2015).

In Austria, the hunting bag of polecats (Western and Steppe combined, the vast majority being the former) increased from 6,000 in 1955 to almost 14,000 in 1968 and then decreased back to 6,000 in 2003 (Reimoser *et al*. 2006). Official hunting bag statistics for 1983–2014 (provided by STATcube [Statistische Datenbank von Statistik Austria] per A Kranz *pers. comm.* 2016) show strong indication of periodical cycling (approximately 10 years between peaks, with troughs about three-quarters of the preceding peaks) but an obvious general downward trend resulting in an approximate halving of the hunting bag in the 31-year period. These data are consistent with ongoing population decline, but the role of variation in hunting effort is difficult to untangle, although at least the cycling seems more likely to reflect Polecat population than hunter behaviour. If so, this urges particular care when looking at trends in population (or in surrogates such as road-kills or hunting bags) derived from only a few years' data.

No monitoring or survey have been performed in Italy. The only data on this species's status come from road casualties, but these are not systematically collated. The present conservation status in Italy is thus considered unknown by the National Institute for Nature Protection (ISPRA) (M. Pavanello *pers. comm.* 2016).

In Germany, there is widespread opinion of decline, originally noted through decreasing hunting bags (A. Schreiber *pers. comm.* 2015). In Saxony, there was a steep decrease during the late twentieth century (H. Ansorge *pers. comm.* 2015). The most detailed information comes from Saxony-Anhalt: between 1962–1989 and 2005–2014, the range in this state (total land area: 20,452 km²) dropped by 10,120 km²; and the number of Polecats found victim to road or rail accidents approximately halved between 2006–2007 and 2012, without the implementation of any polecat-specific protection measures on roads or railways, suggesting that the change reflects the local Polecat population density (A. Weber *pers. comm.* 2015). It is impossible to judge how representative these alarming results are for a wider area, because of the lack comparable case studies from elsewhere. Comparable declines are strongly suspected in at least three other federal states of Germany (Mecklenburg – Western Pomerania, Brandenburg and Thuringia; more or less all eastern federal states with equal agricultural methods) (A. Weber *pers. comm.* 2015). Moreover, there is nothing obviously unique about the general situation of agriculture and other human factors in these states of Germany, making it quite plausible that the situation is similar across much of Central Europe's agricultural landscape.

The status of the North African populations part of, or allied to, this species is poorly known; the species

may now be very rare (Gippoliti 2011, Ahmim 2013, Griffiths and Cuzin 2013).
Current Population Trend: Decreasing

Habitat and Ecology **(see Appendix for additional information)**

Over its wide geographic range, Western Polecat is found in a wide variety of habitats (Zabala *et al*. 2005 and references therein). It occurs widely in lowland woods and in riparian zones, and in rural areas close to farms and villages in the winter; but it also uses wooded steppe, sand dunes, marshes and river valleys, agricultural land, forest edge and mosaic habitats (Birks 1999, Cabral *et al.* 2005). In the Russian Federation, which comprises the majority of its global range, waterside habitats are very important for the species (D. Skumatov *pers. comm.* 2016). In Spain, it lives in a very wide range of environments, from Atlantic to Mediterranean habitats (Virgós 2007, J. Herrero *pers. comm.* 2015) with again an association with water-edge habitats (Zabala *et al*. 2005). In general, mountainous areas are avoided. In the French Mediterranean region in particular, Polecat records are much less frequent than elsewhere in the country; the species' presence in this region seems linked to the presence of wetlands (S. Ruette and M. Guinot-Ghestem *pers. comm.* 2015), as has been found in Italy and Portugal (Rondinini *et al*. 2006, Mestre *et al*. 2007).

It feeds on live lagomorphs, rodents (various genera of voles, mice and hamsters), amphibians and other vertebrates, also sometimes on invertebrates and carrion (e.g. Birks 1999). In many Mediterranean areas, it is specialised in the predation of lagomorphs, notably European Rabbit *Oryctolagus cuniculus* (Roger 1991, Santos *et al*. 2009).

Systems: Terrestrial

Use and Trade

Western Polecat is legally hunted in the Russian Federation and in various other countries for its fur. Because of the high variety of shades of hairs and their gradations it is difficult to find two or three hides of the same coloration, and it is impossible to find thirty or fifty similar hides for a jacket – hence Western Polecat furs harvested from the wild can be found on the Russian domestic market only in the form of smaller handicraft products such as hats and caps (N. Dronova and A. Vaisman per R. Melisch *pers. comm.* 2016). Industrial production use farmed hides from hybrid forms. According to Sergey Stolbov, President of the Russian Fur Union (A. Vaisman per R. Melisch *pers. comm.* 2016), Western Polecat, as the species is treated by the Red List (pure-bred offspring of individuals taken from the wild), has never been farmed for hide production. Hybrids with Domestic Ferret (i.e. *M. putoris* × *M. (putoris) furo*) are, however, farmed in Russia at two fur farms (one in Pushkino close to Moscow, one in Tver province) in industrial volumes, producing about 30,000-35,000 hides per year. These are all solely for the Russian domestic market and there are multiple regularly breeding coloured forms of furs: pearl, golden, snowy-white, coal-black, etc. Statements that the species is farmed for fur in the Russian Far East (e.g. Dronova and Shestakov 2005), many thousand kilometres from its natural range, are likely also to refer to the said hybrid form.

The EU-TWIX database and mailing list exchanges which concentrate on information on seized specimen of fauna and flora from the wild hold, as of February 2016, no information relating to this species. (http://www.eutwix.org/ ; http://www.traffic.org/home/2015/12/3/eu-twix-ten-years-of-enforcement-assistance.html; V. Sacré per R. Melisch *pers. comm.* 2016). There is also no seizure information held in

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China on the species (Xiao Yu per R. Melisch *pers. comm.* 2016).

Threats (see Appendix for additional information)

Population declines in western Europe have generally been attributed to over-hunting and to heavy loss or modification of the species' preferential habitats of wetlands and hedged farmland (e.g. Roger *et al*. 1988, Birks & Kitchener 1999, Baghli and Verhagen 2003). Hunting is now likely to be less of a problem than formerly except at a local scale, whereas agrochmicals and introduced carnivores may be widespread and increasing threats (see below).

Wetland destruction has been identified as a cause of decline in Germany and Switzerland (A. Schreiber *pers. comm.* 2015, P. Dollinger *pers. comm.* 2015). In areas where the Polecat is associated with wetlands, reduction of these habitats is particularly damaging in autumn and winter, during periods of lower abundance of amphibians (Weber 1989, Lodé 1991, Baghli *et al*. 2002). In France, the drying of wetlands and the increase of agricultural land more than halved the total wetland area between 1940 and 1990 (Report Claude Bernard 1994). Hedges provide adequate cover for Polecat activity in otherwise open farmland (Birks 2000). Consequently, the wide destruction of hedgerows that occurred in western Europe in the mid and late 20th century is likely to have contributed to the decline of the species. Indeed, despite a slowdown in the uprooting of hedgerows since the 1990s, hedgerow surface area declined by 5% per year in France from 1982 to 1990 (Pointereau 2002).

Reduced prey-base also causes some declines, particularly in Mediterranean areas where European Rabbit *Oryctolagus cuniculus* forms a large part of the diet (see 'Habitats and ecology' section). Mediterranean Rabbit populations have been in steep decline for 25 years because of diseases, such as myxomatosis (Calvete *et al*. 1997) and rabbit haemorrhagic disease (RHD) (Moreno *et al*. 2007, Delibes-Mateos *et al*. 2009), and modification of its habitat and hunting (Calvete *et al*. 2006). The steep declines in Switzerland up to the 1970s were attributed in part to declining populations of amphibians (P. Dollinger *pers. comm.* 2015). Declines in other prey species, such as European Hamster *Cricetus cricetus* and even rats and mice (Muridae) probably contribute to the steep declines in parts of the range such as Saxony-Anhalt, Germany (A. Weber *pers. comm.* 2015). Such declines are driven by intensive agriculture (high pesticide use, rapid cultivation, choice of crops and the near-complete use of land.

Western Polecat is vulnerable to heavy trapping. It disappeared from most of Britain because of sustained intensive trapping, as a pest of game-birds and small livestock, from the 19th century into the early decades of the 20th (Langley and Yalden 1977). However, it recolonised the country following the near-cessation of this practice (Birks and Kitchener 1999, Birks 2000) and the resurgence of Rabbit populations (Birks 2000).

In western Europe, Western Polecat was formerly widely hunted for sport and fur and persecuted as a pest, but these threats have become less serious. The species is now protected in a number of range states and in such areas, the rates of hunting have greatly reduced. For example, in Switzerland, in each of the years 2009, 2013 and 2014 only a single individual (male) was killed under special license. Cantons issuing the licenses were Zurich, Berne and Argovia (P. Dollinger *pers. comm.* 2016). In such areas, legal killing cannot be a threat. In France, Western Polecat was classified as 'pest' in half of (49) French departments in 1997, 1999 and 2001. But trapping of Polecats has progressively decreased since 1998, and has not been permitted since 2012 (Albaret *et al*. 2014), except in two areas (totalling around 3,500 km²). However, even before the ban, trapping intensity seemed limited: in 1998, catches were

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performed in only 8.6% (± 14%) of localities where the species could legally be trapped (Ruette *et al*. 2004), and only around 6,000 catches by trapping were registered in France in 2011 (Albaret *et al*. 2014). August 2012 modification of the French legislation about 'pest' species meant that the Polecat could not be trapped until July 2015; subsequent legislation (July 2015 to July 2018) does not permit trapping of Polecats except in two areas. However, legal trapping for other mustelid species and non-selective predator control (see Treves and Naughton-Treves, 2005) could represent a threat for the Polecat (S. Ruette and M. Guinot-Ghestem *pers. comm.* 2015). In particular, trapping campaigns against the American Mink *Neovison vison* have resulted in many Polecats being killed in confusion (C. Arthur *pers. comm.* 2016). Hunting Western Polecat with guns remains legally permitted in France. The 2013 national enquiry estimated that fewer than 3,000 Polecats were hunted in 2013 in France (ONCFS-FNC in press).

Hunting, as a perceived pest of wild game, is legal throughout the year in Austria (A. Kranz *pers. comm.* 2016).

By contrast with much of western Europe, in European Russia the species is still hunted. However, intentional hunting is not intensive because the price per pelt is so cheap: only 30–50% of that of American Mink and 10–20% that of martens *Martes*. In the area of best habitat for the species in Russia, the southern forest expanses in the European part, the polecat is hunted intentionally only occasionally, for example as a pest of domestic animals such as chickens (D. Skumatov *pers. comm.* 2015). Harvest usually occurs as a 'by-catch'of hunting for American Mink and Pine Marten *Martes martes* (A. Vaisman per R. Melisch, *pers. comm.* 2016). The species is fairly frequent by-catch in traps set for American Mink, but only rarely in the baited leghold traps set for martens, beavers *Castor*, Red Fox *Vulpes vulpes*, badgers *Meles*, Musk Rat *Ondatra zibethicus*, Eurasian Lynx *Lynx lynx* and others (D. Skumatov *pers. comm.* 2015). In one area, the trapping of 4,000 Pine Martens resulted in only about 100 Western Polecats taken as bycatch (A. Saveljev pers. comm. 2016). Overall, trapping is not a threat to the species in Russia (A. Saveljev *pers. comm.* 2016). In Morocco and Algeria, in at least some areas, the species is captured for hunting (e.g. Ahmim 2013).

In Saxony-Anhalt, Germany, Polecats have a very high pollutant burden (PCB, PBB, PBDE, OCP and human medicine) leading to diminished reproductive output (which is particularly problematic for 'r-strategy' species such as this) (A. Weber *pers. comm.* 2015). There is too little comparable information from other parts of the species's range, but there is no reason not to think that similar pollutant loads will not be borne by populations elsewhere in lowland mesic western and central Europe, given patterns of human settlement and agriculture. Frogs sampled in Switzerland in the 1980s had high levels of PCBs and these pollutants were considered to have led to major declines in the country's Eurasian Otter *Lutra lutra* populations (Weber 1990); subsequently otter populations have strengthened in the country (P. Dollinger *pers. comm.* 2016); Polecat numbers have risen at the same time although the cause is not known. Secondary rodenticide poisoning (see Shore *et al*. 1996, 1999, 2003; Birks 1998; Fournier-Chambrillon *et al*. 2004; Giraudoux 2006) could potentially be an important threat, but its impact on Polecat populations remains to be evaluated extensively.

The introduced American Mink is likely to be a problematic, at some level, for the Polecat in the large parts of its range where this invasive species is now established. The long-term population-level consequences on the Polecat of the variety of effects of this species (see, e.g. Barrientos 2015) remain poorly understood. Three carnivore species are believed to be driving Polecat declines in Belarus: the

introduced American Mink in valley ecosystems (competition for prey during raising kits, especially the decline in Water Voles *Arvicola amphibius* effected by American Mink, and interference towards vulnerable female Polecats); the introduced Raccoon Dog *Nyctereutes procyonoides*, mainly in forest–swamp mosaics (competition for carrion in late winter); and the Beech Marten *Martes foina* (interference in human settlements and their surroundings) (Sidorovich 2011, V.E. Sidorovich *pers. comm.* 2016). In Latvia the species is possibly being displaced from some areas around human settlement by Beech Marten (J. Ozolins *pers. comm.* 2015).

The extent to which hybridisation threatens populations is unclear. Hybridisation with wild-living Domestic Ferrets *Mustela furo* occurs in the United Kingdom (Costa *et al*. 2013) but it seems unlikely that on the mainland populations will in the long-term depart phenotypically from wild-type Polecats. In Britain feral Ferrets generally only thrive on islands and appear to be unable to withstand competition from *M. putorius* (A. Kitchener *pers. comm.* 2015). In Saxony-Anhalt, Germany, introgression with Domestic Ferret was found in 6% of 34 individuals tested genetically, and in 10% of 104 checked morphologically (for skull constriction) (A. Weber *pers. comm.* 2016). Overall, the zone of sympatry between Western Polecat and Steppe Polecat *M. eversmanii* includes 43% of the former's distribution area and 20% of the latter's (Ternovski and Ternovskaya 1994). Wild-taken hybrids are held in museums of Ukraine, Belarus, and also in the Rostov-on-Don and Orel cities (Russia) (Ternivski and Ternovskaya 1994). The sympatry is not the result of recent range expansion, suggesting that such hybridisation is unlikely to be a threat to the species. Hybridisation also occurs with European Mink *M. lutreola*, but again this seems unlikely to be a threat to this species.

Mustelids are described as vulnerable to accidental mortality from road traffic (Birks 1993) and the widespread steep increase of road traffic in western Europe and increasingly elsewhere in the species' range might have population-level effects in areas of high road density. Moreover, the presence of Polecat prey on and near road-verges may also increase its traffic collision mortality of the predator (Birks 1993, Barrientos and Bolonio 2008).

Conservation Actions **(see Appendix for additional information)**

Given the widespread opinion and localised evidence of recent steep declines in continental western Europe, the most important conservation requirement is for research to clarify the range of threats, and, for each, the intensity and geographic spread, to allow the design and implementation of effective conservation measures where they are needed. In particular, it is urgent to undertake, across Europe, research comparable to that in Saxony-Anhalt, Germany, which has indicated recent steep declines there (A. Weber *pers. comm.* 2015; see 'Population' section).

Western Polecat is listed on Appendix III of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Annex V of the EU Council's Directive on the conservation of natural habitats and of wild fauna and flora (EU Habitats Directive). It is protected in Italy (M. Pavanello *pers. comm.* 2016) and under Schedule 6 of the Wildlife and Countryside Act (UK) and by the regional Red Data Book on southern border of its Russian area, in Rostovskaya oblast' (Rostov-na-Donu city) (D. Skumatov *pers. comm.* 2015). In Spain, it is listed in the national Red Data Book as Near Threatened (Virgós 2007). In Switzerland it was categorised as Vulnerable in 1994; it will shortly be reassessed (P. Dollinger *pers. comm.* 2016). The species was included in the 'pre-warning list' (analogous to Near Threatened) for Germany in 1998 and was kept therein in the new edition of the German Red List in 2009. This status is a compromise between the various red lists of the many German Bundesländer

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(provinces), some of which classify the polecat in higher threat categories, while there could still be provinces where the polecat is not included yet at all (A. Schreiber *pers. comm.* 2015). It is registered in Annex V to DHFF (Directive Habitats-Faune-Flore), France, and therefore benefited from an assessment of its conservation status in 2007 (2002–2006) and in 2013 (2007–2012) (Bensettiti and Puissauve 2015). It receives at least some level of protection in many other range states. In Saxony-Anhalt, Germany, where steep declines have recently been demonstrated, hunting is prohibited for the period 2015-2019 (with possibility of extension) to preserve Polecat numbers. This has prompted intensive study of occurrence, population dynamics, genetic monitoring, and survey of carcases (A. Weber *pers. comm.* 2016). It occurs in many protected areas across its range.

The decline in Switzerland up to the 1970s was combated by the improvement of habitat by creation of new ponds for amphibians and revitalisation of small rivers (P. Dollinger *pers. comm.* 2015). In much of continental western Europe it is very important to widen and restore river-banks and wetlands and to accept Eurasian Beaver *Castor fiber* as a promotor of natural habitat development. It is similarly important to restore the edges of woods and hedges and to minimise mowing of fallow agricultural land and of field boundaries. Restocking operations are trying to rebuild some Rabbit populations, particularly in the Mediterranean region (Letty *et al*. 2006), but methods need to be improved (Calvete *et al*. 1997, Moreno *et al*. 2007). These transactions may prove beneficial in maintaining the Polecat (Birks 2000). Conservation of Eurasian Hamster *Cricetus cricetus* is beneficial to the Polecat and warrants wider implementation.

Where either occurs, control of American Mink *Neovison vison* and Raccoon Dog *Nyctereutes procyonoides* important to prevent declines of Western Polecat. Reduced release of Domestic Ferrets *Mustela furo* into the wild would reduce the (apparently rather low) threat from introgression.

The taxonomic and conservation status of the North African populations part of, or allied to, this species is poorly known. They may now be very rare, an issue of concern if they are an autochthonous, potentially somewhat taxonomically distinct, form (Gippoliti 2011, Ahmim 2013, Griffiths and Cuzin 2013). A taxonomic assessment of these populations is a priority and if they are native, they warrant conservation measures.

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Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.4. Forest - Temperate	-	Suitable	-
3. Shrubland -> 3.4. Shrubland - Temperate	-	Suitable	-
3. Shrubland -> 3.8. Shrubland - Mediterranean-type Shrubby Vegetation	-	Suitable	-
4. Grassland -> 4.4. Grassland - Temperate	-	Suitable	-
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	-	Suitable	-
5. Wetlands (inland) -> 5.2. Wetlands (inland) - Seasonal/Intermittent/Irregular Rivers/Streams/Creeks	-	Suitable	-
5. Wetlands (inland) -> 5.3. Wetlands (inland) - Shrub Dominated Wetlands	-	Suitable	-
5. Wetlands (inland) -> 5.4. Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands	-	Suitable	-
5. Wetlands (inland) -> 5.7. Wetlands (inland) - Permanent Freshwater Marshes/Pools (under 8ha)	-	Suitable	-
5. Wetlands (inland) -> 5.8. Wetlands (inland) - Seasonal/Intermittent Freshwater Marshes/Pools (under 8ha)	-	Suitable	-
13. Marine Coastal/Supratidal -> 13.3. Marine Coastal/Supratidal - Coastal Sand Dunes	-	Suitable	-
14. Artificial/Terrestrial -> 14.1. Artificial/Terrestrial - Arable Land	-	Suitable	-
14. Artificial/Terrestrial -> 14.2. Artificial/Terrestrial - Pastureland	-	Suitable	-
14. Artificial/Terrestrial -> 14.4. Artificial/Terrestrial - Rural Gardens	-	Suitable	-

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	Majority (50-90%)	Negligible declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Majority (50-90%)	Negligible declines	Low impact: 5
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.1. Intentional use (species is the target)	Ongoing	Majority (50-90%)	Negligible declines	Low impact: 5
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.2. Unintentional effects (species is not the target)	Ongoing	Majority (50-90%)	Negligible declines	Low impact: 5
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.3. Persecution/control	Ongoing	Majority (50-90%)	Negligible declines	Low impact: 5
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.1. Abstraction of surface water (domestic use)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.2. Abstraction of surface water (commercial use)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.3. Abstraction of surface water (agricultural use)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.5. Abstraction of ground water (domestic use)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.6. Abstraction of ground water (commercial use)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.7. Abstraction of ground water (agricultural use)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Neovison vison)	Ongoing	Majority (50-90%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Mustela furo)	Ongoing	Minority (50%)	Unknown	Unknown

	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.1. Hybridisation
9. Pollution -> 9.1. Domestic & urban waste water -> 9.1.1. Sewage	Ongoing	Minority (50%) Negligible declines Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.3. Herbicides and pesticides	Ongoing	Minority (50%) Negligible declines Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: No
Systematic monitoring scheme: Yes
In-Place Land/Water Protection and Management
Conservation sites identified: No
Occur in at least one PA: Yes
Area based regional management plan: No
Invasive species control or prevention: Yes
In-Place Species Management
Harvest management plan: Yes
Successfully reintroduced or introduced beningly: Unknown
Subject to ex-situ conservation: Yes
In-Place Education
Subject to recent education and awareness programmes: Yes
Included in international legislation: Yes
Subject to any international management/trade controls: Yes

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
2. Land/water management -> 2.2. Invasive/problematic species control
2. Land/water management -> 2.3. Habitat & natural process restoration

Conservation Actions Needed
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.2. Policies and regulations

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.1. Taxonomy
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.2. Harvest level trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Continuing decline in area of occupancy (AOO): Unknown
Extreme fluctuations in area of occupancy (AOO): No
Continuing decline in extent of occurrence (EOO): Unknown
Extreme fluctuations in extent of occurrence (EOO): No
Continuing decline in number of locations: Unknown
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 0
Upper elevation limit (m): 2400
Population
Continuing decline of mature individuals: Yes
Extreme fluctuations: Unknown
Population severely fragmented: No
Continuing decline in subpopulations: No
Extreme fluctuations in subpopulations: No

http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T41658A45214384.en

Population
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Unknown
Generation Length (years): 4.5
Movement patterns: Not a Migrant

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

The IUCN Red List Partners are: BirdLife International; Botanic Gardens Conservation International; Conservation International; Microsoft; NatureServe; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; Wildscreen; and Zoological Society of London.