Disease Risk Analysis for the reintroduction of the European wildcat (*Felis silvestris*) within England

Forestry England

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Executive summary

The International Union for the Conservation of Nature (IUCN) has established guidelines for wildlife reintroductions, as well as a disease risk analysis (DRA) process, recommending a level of attention to disease and parasite issues proportional to each translocation situation. This overarching DRA for the reintroduction of the European wildcat (*Felis silvestris*) to localities within England was also performed to be compliant with UK animal health and welfare legislation. Sources of wildcats for reintroduction considered included captive populations within Great Britain, captive populations in Europe, as well as wild origin wildcats from Europe, including trapped, rescued or rehabilitated wildcats.

This DRA identified 126 hazards, of which 64 have been previously reported as occurring in wildcats in Europe in published peer-reviewed literature. 101 hazards were infectious or parasitic diseases, and 25 hazards were non-infectious in nature. 23 hazards were evaluated as high risk. Of these high-risk hazards 21 were infectious diseases, of which 8 were viral. Of the high-risk viral disease hazards one, rabies, could be mitigated to low risk, and the other 7 hazards to medium risk. Of these high-risk viral disease hazards, three have no vaccinations available and disease screening and captive care protocols are the only mitigations available to reduce risk. Viral diseases had the greatest proportion of hazards evaluated as high risk without mitigation, at 42%. Only 8% of non-infectious hazards were evaluated as high risk before mitigation. 41 medium risk and 62 low risk hazards were also identified. There were 19 viral, 27 bacterial, 5 fungal and 10 protozoal disease hazards identified. There were 8 ectoparasitic disease and 32 endoparasite hazards identified.

After mitigation, 114 hazards are reclassified as low risk and a further 11 as medium risk, and only a single hazard remained high risk even after mitigation – hybridisation. Seven high risk infectious disease hazards are not currently found in the UK, and a total of 16 diseases hazards of all risk categories are not found in the UK. Nine legally notifiable diseases in the UK were identified as hazards. Two of these were evaluated as high-risk hazards before mitigation- Rabies and Echinococcus. All high-risk hazards identified and not currently found in the UK can be lowered to low-risk hazards if mitigations are in place.

Many infectious disease hazards identified pose their main risk to groups of cats such as in a captive breeding facility, or from their risk of causing zoonotic disease in animal care workers, rather than to the released wildcats themselves, or native or domestic animals. 48 infectious diseases hazards are potentially zoonotic in nature, including 10 of the high risk classified disease hazards. Not all zoonotic diseases are transmissible directly between wildcats and humans and vice versa, with 17 potentially zoonotic hazards classified as low risk.

There are different potential sources for wildcats for potential release in England or establishment of captive breeding populations. These include wildcats currently captive in the UK; the importation of wildcats from Europe currently bred in captive facilities such as zoos; and the importation of wild-born wildcats, either from trapping in the wild or from rescue and rehabilitation facilities. Each have specific advantages and difficulties. The most suitable wildcats currently captive in the UK have likely mainly already been selected, based on health status, genetics and low levels of hybridisation for captive breeding and release to augment the small current Scottish wildcat population. It appears likely that limited suitable animals are currently available in the UK for a release program in England. Similar

numbers of European wildcats are currently housed in zoos across Europe to wildcats housed in zoos in the UK. Import of such animals into England from Europe is relatively straight forward under the Balai Directive (Article 4 of Council Directive 92/65/EEC) between approved establishments and would not need any legally mandated quarantine or inspections on arrival in the country, although a project directed minimum quarantine period of 30 days is still needed in reducing risks of infectious disease hazards, as recommended by the IUCN. For wildcats captive in an approved centre under the directive for over 120 days a rabies quarantine waiver can also be applied for so Animal and Plant Health Agency (APHA) quarantine inspections are not needed. The main disadvantages to sourcing already captive breed wildcats from Europe are the small number of source animals likely to be available, and that imports would have to be arranged with different institutions in different countries, each requiring separate animal health certificates completed by the exporting countries official veterinarians.

Sourcing wild origin wildcats from Europe may appear a reasonable alternative to sourcing captive wildcats but has important disadvantages. Only small numbers of wildcats are likely to enter wildlife rescue or rehabilitation centres, and these individuals are likely to have been admitted due to injury, disease, or age-related issues, or may simply be individuals failing to cope in the wild. There may be some animals that have suffered debilitating injuries making them unsuitable to return to the wild, but still reasonable for captive breeding, but there is little indication there are suitable numbers of such animals already in captivity.

Trapping of healthy wildcats is theoretically able to provide a reasonable founder population, but this would likely entail significant time, costs and staffing. Trapped wildcats would then need to undergo 120 days quarantine at a Balai approved centre, such as a local or regional zoo, and health and genetic screening would need to be undertaken during this quarantine. After this quarantine the wildcats would legally be able to be imported as from any other European approved facility, and a rabies quarantine waiver could be applied for from APHA, as well as an animal health certificate for import, completed by an official veterinarian from the country of export, as issued by APHA. With the high prevalence seen in previous published studies of incurable viral diseases evaluated as high-risk hazards, most trapped wildcats could well fail initial disease screening and hence be unsuitable for import. There may be significant costs incurred for trapped wildcats that fail the criteria to join the captive program, and these cats may then require euthanasia as they may not be deemed fit to return to the wild under the differing animal welfare legislation in some countries.

Continued annual vaccinations, regular faecal parasitology screening, quarterly prophylactic deworming, including tapeworm treatments, husbandry and cleaning practices, as well as minimising stocking density, excellent biosecurity and minimising stress to captive cats are essential to maintaining healthy low disease risk captive populations for breeding and release to the wild. To minimise any risk to native wildlife, humans, domestic animals and previously released wildcats comprehensive health and disease screening is again needed just prior to the release of wildcats to the wild. Community and stakeholder engagement are also important to minimising the post release hazard risks, and particularly those posed by un-neutered and unvaccinated feral and domestic cats. Trap-neuter-vaccinate-release (TNVR) programs, or control of feral cat populations are essential to mitigating the high risk posed by hybridisation to the small number of initially released wildcats. TNVR programs in other projects such as the Scottish wildcat releases have needed very high rollout to be effective. This needs accurate modelling, if resource and manpower is to be properly directed towards this important mitigation.

Introduction

The European wildcat (*Felis silvestris*) is considered a species of conservation concern due to ongoing threats to its population (Bastianelli *et al*., 2021), and hybridisation with domestic cats (*Felis catus*) is a particular problem. It is afforded legal protection under the Bern Convention and the EU Habitats Directive. Within Britain the wildcat, is often termed the Scottish wildcat (*Felis silvestris silvestris*), representing the last extant native felid in the United Kingdom. It is hypothesized to have diverged from the continental European population approximately 7,000 to 9,000 years ago (Yalden, 1999). Historically, wildcats were distributed across mainland Britain, but their numbers began to decline sharply in the 19th century due to factors such as overhunting for sport and fur, vermin control measures, and extensive habitat loss. By the late 19th century, wildcat populations were confined to parts of the Scottish Highlands, particularly the north-west (Langley & Yalden, 1977).

A brief recovery in wildcat numbers occurred during World War I (1914-1918) when the conscription of gamekeepers resulted in reduced hunting pressure (Easterbee *et al*., 1991). However, despite this temporary reprieve, the species remains endangered in Britain, with ongoing threats such as persecution (Langley & Yalden, 1977), habitat fragmentation (Nowell & Jackson, 1996), and hybridisation with domestic cats, which facilitates disease transmission (Beaumont et al., 2001; Macdonald *et al*., 2004; Kilshaw *et al*., 2010). Since the 1980s, wildcat populations have been restricted to fragmented regions in northern Scotland, including the Cairngorms, Sutherland, central Highlands, and select western coastal areas (Davis & Gray, 2010).

The wildcat exhibits a pelage characterized by yellowish-brown to greyish-brown fur, with distinctive dark brown or black stripes. The tail is blunt and club-shaped, featuring thick fur and black rings. Sexual dimorphism is evident, with males generally weighing between 3-7 kg, and females between 2-5 kg (Kilshaw, 2011; Campbell, 2015). Pelage traits, such as coat pattern and body morphology, are commonly used to differentiate wildcats from domestic cats and their hybrids, although these characteristics are not always definitive. Kitchener et al. (2005) provided a detailed description of these traits to assist in distinguishing wildcats, though hybridisation complicates the assessment of genetic purity.

Wildcats are predominantly solitary, except when females are rearing offspring. Olfactory communication is central to social interactions, with individuals using scent-marking via cheek rubbing, scat deposition, and urine spraying to delineate territories (Kilshaw, 2011). Females tend to maintain exclusive home ranges, while males have overlapping territories that encompass the ranges of multiple females (Macdonald *et al*., 2004). The size of an individual's territory is largely influenced by prey availability and habitat quality (Easterbee *et al*., 1991). Dispersal typically occurs at 5-6 months of age, as juveniles establish their own territories (Kitchener, 1995).

Wildcats reach sexual maturity by one year of age. The mating season occurs between January and March, with an average litter size of 3-4 kittens born in April or May (Kitchener, 1995; Macdonald *et al*., 2004). In the wild, wildcats rarely live beyond 6 years, although lifespans of up to 10 years have been documented (Balharry & Daniels, 1998; Anile *et al*., 2020).

The wildcat is a habitat generalist, typically occupying ecotones along woodland edges, forests, and scrubland patches. These habitats provide essential shelter and breeding sites, while adjacent mixed grasslands offer foraging opportunities (Daniels *et al*., 1998; Klar *et al*., 2008). The wildcat's diet primarily consists of European rabbits (*Oryctolagus cuniculus*) where available, and a range of small rodents such as voles (Microtinae) and mice (Murinae) (Silva *et al*., 2013).

Hybridisation with domestic cats poses a significant threat to the genetic integrity of wildcat populations internationally, particularly in areas with low population density (Clutton-Brock, 1987; Serpell, 2000). Extensive introgressive hybridisation complicates efforts to distinguish genetically pure wildcats from hybrids, making conservation, monitoring, and management efforts challenging. Identification typically relies on a combination of pelage characteristics and genetic analysis, although these methods are not always definitive (Kitchener *et al*., 2005; Driscoll *et al*., 2007; Macdonald, 2010).

Wildcats face numerous mortality risks, including disease transmission from feral and domestic cats, as well as other animals, and exposure to environmental toxins. Studies have identified significant traces of dieldrin, an organochlorine pesticide, and pp'-DDE in the livers of sampled wildcats, suggesting bioaccumulation of toxins through prey (McOrist & Kitchener, 1994). In addition, anthropogenic factors contribute to mortality. In Germany, road traffic accidents are a leading cause of wildcat fatalities, particularly among males. This sex bias may be attributed to females selecting and occupying smaller territories with greater vegetation cover for rearing kittens (Klar *et al*., 2009; Oliveria *et al*., 2018).

The wildcat faces numerous anthropogenic and ecological threats, including habitat loss, hybridisation with domestic cats, disease transmission, and environmental toxins. Despite ongoing conservation efforts, the species remains endangered in Britain. Effective conservation strategies require a multifaceted approach, encompassing habitat protection, genetic monitoring, and mitigation of human-wildcat interactions to secure the long-term survival of this native felid.

Britain is one of the most nature and biodiversity depleted countries in Europe, with numerous iconic wildlife species originally present now being extinct. The Eurasian beaver (*Castor fiber*) has demonstrated that with care and a rigorous scientific approach de-extinction of missing iconic mammals in Britain is possible. Bolstering of the sparse current European wildcat (*Felis silvestris* Schreber, 1777) population in Scotland by releases of captive born individuals has recently occurred in the Cairngorms National Park, and reintroduction of the European wildcat in England is now highly desirable. Reintroduction of the species in England differs from Scotland in not having a residual population. It may not be hampered by the same controversies of the remaining population's genetics and level of hybridisation as in Scotland, but it faces different challenges. It however also offers the opportunity to consider a wider range of source animals for reintroduction, each with different risk profiles.

The objective of this document is to present a comprehensive Disease Risk Analysis (DRA) addressing the reintroduction of the European wildcat to England. Any robust and fitting DRA aims to limit and best mitigate risks posed by reintroductions as far as reasonably and practically possible, within the context of still facilitating conservation reintroductions to reverse nature depletion and the enhancement of biodiversity. If taken to extremes by some performing these analyses, misguided attempts to try to entirely prevent any risks, may simply block reintroductions efforts.

Conservation reintroductions

Wildlife reintroductions have the potential to assist species' survival, ecosystem restoration, and increase biodiversity, and while there is often widespread public support for the concept of wildlife reintroductions it is also important to recognise that such releases can carry some significant risks to human and animal health. Just as the movements of domestic animals can result in the introduction or spread of important animal and human diseases, so too do the movements and reintroduction of wild animals carry their own risks. Wildlife reintroductions can introduce or increase the incidence of diseases transmissible to humans (zoonosis); spread infections of importance to domestic animals and livestock, with important economic implications; or introduce diseases to other native wildlife, with adverse wildlife population and ecological effects.

The International Union for the Conservation of Nature (IUCN) has well established published guidelines for both wildlife reintroductions as well as the disease risk analysis process. The IUCN (2013) recommends that "the level of attention to disease and parasite issues around translocated organisms and their destination communities should be proportional to the potential risks and benefits identified in each translocation situation". Disease risk assessment should be applied to evaluate whether important health-related risks are associated with a proposed translocation of wild animals, and pre-release health assessments are also essential to ensure that UK animal health and welfare legislation is complied with.

The physical act of moving, testing and releasing wild animals in new and unfamiliar locations and habitats can also impact their individual survival. The stress associated with this process can result in a degree of immunosuppression, from prolonged elevations in stress hormones, further compromising their health, welfare and ability to survive. Many wild species will hide symptoms of ill health or may carry infections without showing any symptoms. Not only can these pose a risk to humans and other animals but may progress with the stress of translocation to manifest in ill health and compromise the individual animals' welfare, or ability to survive.

European wildcat translocated for reintroduction are deemed "under the control of man" and hence subject to the provisions of the Animal Welfare Act 2006 in England, and the Animal Health and Welfare (Scotland) Act 2006. This mandates that keepers have a positive duty of care, to provide the five basic welfare needs, which also includes protection from pain, suffering, injury and disease. The release of any captive animal (even if only temporarily captive for the purposes of translocation or reintroduction) that is not fit to be released, would constitute an offence under the Act.

Imports to the UK of live animals and germinal products are subject to Council Directive 92/65/EEC (Balai Directive) rules. Holding premises must normally be inspected and approved by the Animal and Plant Health Agency (APHA) on behalf of the UK and Scottish Governments, including for conservation purposes. An import notification must also be submitted to APHA before any animals arrive from outside the UK for conservation purposes, and a health certificate and import licence or authorisation needs to be issued by an official veterinarian from the exporting country.

Purposes of Health (Disease) Risk Analysis

It is essential to recognise that no disease risk analysis and subsequent disease testing and screening process can entirely eliminate all risks. The purpose is to limit risks as far as is practically and reasonably possible using scientific evidence as guidance, using established, recognised and robust methodologies for the combination and assessment of the sometimes disjointed availably scientific evidence with many wildlife species.

The purposes of disease risk analysis and mitigations are to:

- Promote the health and welfare of the individual wild animals that are released
- Prevent introduction of disease-causing pathogens
- Ensure that reintroduced individuals are fit for release
- Provide practical health and disease mitigation protocols for the reintroduction process
- Mitigate stressors in the translocation process as far as possible
- Provide current evidence, peer-reviewed literature and experiences for best practices

Disease Risk Analysis Process

As described by the IUCN, a disease risk analysis usually consists of the following elements:

- Problem description:
    - Outlines the background and context of the problem
    - Identifies the goal, scope and focus of the DRA
    - Formulates the DRA question(s) and objectives
    - States assumptions and limitations, and
    - Specifies the acceptable level of risk.
- Hazard identification:
    - Identifies all possible health (and animal welfare) hazards of concern
    - Categorises them into 'infectious' and 'non-infectious' hazards
    - Establishes criteria for ranking the importance of each hazard within the bounds of the defined problem
    - constructs a scenario tree for the remaining, higher priority, hazards of concern, which must be more fully assessed.
- Risk assessment: Assesses for each hazard of concern:
    - The likelihood of release (introduction) into the area of concern, or its occurrence
    - The likelihood that the species of interest will be exposed to the hazard once released
    - The likely consequences of exposure.
    - On this basis the hazards can be prioritised in descending order of importance
- Risk management: Reviews potential risk reduction or management options and evaluates their likely outcomes. On this basis decisions and recommendations can be made to mitigate the risks associated with the identified hazards
- Implementation and review: Formulates an action and contingency plan and establishes a process and timeline for monitoring, evaluation and review of risk management actions. The review may result in a clearer understanding of the problem and enable refinement of the DRA. This review and refinement aspect is of particular importance for the reintroduction of the European wildcat to different release localities within England, allowing for learning and improved outcomes as projects progress.

Project Scope and Problem Description

This is an overarching England-wide DRA for the reintroduction of the European wildcat (*Felis silvestris*) to release localities within England. Sources of wildcats for reintroduction to England potentially include:

i) captive populations within Great Britain, and/or

ii) captive populations in Europe, which could potentially include rescued or rehabilitated wildcats.

The precedent for wildcat reintroductions in Scotland involved utilising captive bred wildcat populations, but this document also considers the potential for European free-living wildcats being translocated to the wild in England. It therefore includes an overview of what needs to be considered for this possibility.

This DRA acts as a precursor to project-specific Disease Risk Management Strategies. The two projects currently undertaking feasibility within England are the Southwest Wildcat Project, led by Devon Wildlife Trust, and the Kielder Wildcat Project, led by Forestry England. This DRA encompasses expected disease risks right across the English landscape, despite differing geographical attributes across project localities, as well as considering the source populations.

The DRA does not detail and account for all eventualities of translocation strategy. These will be specified in any future Disease Risk Management Strategy associated with specific projects. This comprehensive DRA does however include the disease risks associated with both hard and soft releases of wildcats, as well as from transportation within, between, and into the nations of Great Britain, from Europe.

Outline of the methodology

Following the IUCN guidelines, a four-step process has been used to formulate a DRA (IUCN/SSC 2014) (as detailed earlier in this document):

- Problem description
- Hazard Identification, based on review of the scientific literature
- Risk Assessment, with categorisation of pathogens and health and welfare risks into low, medium and high-risk groups
- Mitigating measures to be considered, and the risk re-evaluated in light of their reported effectiveness.

In an attempt to identify all the infectious disease hazards associated with a wildcat reintroduction, a literature search on reported disease in captive and wild European wildcats was carried out with the use of CAB ABSTRACTS, BIOSIS and MEDLINE databases. The literature search while focusing on *Felis silvestris* also considered diseases known to affect domestic cats, other Felis species, as well as the Eurasian lynx (*Lynx lynx*), in case this species ever be reintroduced in future, and to include those diseases which theoretically may occur in wildcats, but which have yet to be reported. This aims to ensure coverage of the widest range of possible and potential pathogens within the risk assessment process.

Guidance and legislation

This work is in compliance with:

- IUCN-OIE Guidelines for Wildlife Disease Risk Analysis
- IUCN-OIE Manual of procedures for Wildlife Disease Risk Analysis
- IUCN Guidelines to Reintroductions and other conservation translocations

As well as other relevant IUCN, OIE, and National body guidance for best practice compliance, including the IUCN Wildlife Health Specialist Group Quarantine and health screening protocol; Other IUCN Wildlife Health Specialist Group policies; Defra's Reintroductions and other conservation translocations: code and guidance for England; Scottish Natural Heritage (now NatureScot) Best Practice Guidelines for Conservation Translocations in Scotland, and any other relevant guidance.

The document aims to be in compliance with all current relevant legislation, including (but not limited to):

- Animal Welfare Act (2006)
- European Council Directive 92/65/EEC (Balai Directive)
- Animals (Scientific Procedures) Act 1986
- Dangerous wild animal act 1979
- Zoo Licencing Act 1981
- Veterinary Surgeons Act 1966
- Veterinary Medicine Directorate regulations

Hazard Identification

Infectious hazard types, defined according to their broad transmission pathway, novelty and potential for harm in the population(s) of concern.

Hazard type		**Definition**
No.	**Name**	
1	**SOURCE**	Infectious agents, or strains of these agents, from the source population, which are novel to and could cause harm in: a. species in the release region b. species in direct or indirect contact with the translocated population during its transport/ captivity
2	**CAPTIVITY**	Harmful, possibly novel, infectious agents, or strains of these agents, that translocated animals may encounter during transport or captivity and potentially transmit to other species on release: a. from species in direct or indirect contact with the captive, translocation population b. present in areas in which translocated individuals are held during transport and captivity
3	**DESTINATION**	Infectious agents in the release region which are harmful and potentially novel to the released population
4	**CARRIER**	Infectious, including commensal, agents in the source population, which have potential to cause disease in translocated individuals under certain conditions e.g. stress, and which could potentially cause disease in species at the destination under similar conditions (but which are not novel to these species)

Hazard type		Definition
No.	Name	
5	ZOONOTIC	Zoonotic infectious agents present in: a. translocated individuals, or b. project sites, that may harm project personnel or visitors

Summary of hazards identified and risk ratings

Infectious Disease	Agent	Risk rating	Rating after mitigation	Page
VIRAL				
Aujeszky's disease (pseudorabies)	Suid herpesvirus 1	Low	Low	17
Avian influenza	Influenza A virus	High	Medium	18
Bluetongue	Bluetongue virus	Low	Low	20
COVID	SARS-Coronavirus (CoV-2)	Medium	Low	21
Cowpox	Orthopoxvirus	Medium	Low	22
Feline Calicivirus (FCV)	Feline Calicivirus	High	Medium	23
Feline gammaherpesvirus	Felis catus gammaherpesvirus 1(FcaGHV1	Low	Low	24
Feline Immunodeficiency Virus (FIV)	Feline Immunodeficiency Virus	High	Medium	25
Feline infectious peritonitis (FIP) and Feline enteric coronavirus (FECV)	Feline coronavirus (FCoV)	High	Medium	26
Feline leukaemia virus (FeLV)	Feline leukaemia virus	High	Medium	28
Feline panleukopenia (Feline parvovirus, feline infectious enteritis)	Feline panleukopenia virus (Carnivore protoparvovirus 1)	High	Medium	29
Feline Rotavirus	Rotavirus	Low	Low	30
Feline spongiform encephalopathy	Pathogenic prion protein (PrPSc)	Low	Low	31
Feline syncytial virus	Feline foamy virus (FeFV or FFV)	Low	Low	31
Feline viral papillomatosis	Papillomavirus	Low	Low	33
Feline viral rhinotracheitis (FVR) (Feline Herpes Virus (FHV))	Felid alphaherpesvirus 1	High	Medium	34
Rabies	Rabies virus (lyssavirus)	High	Low	35
Staggering disease	Borna disease virus 1 (BoDV-1) and Rustrela virus (RusV)	Low	Low	37
West Nile Virus	West Nile Virus	Low	Low	38
BACTERIAL				
Anthrax	*Bacillus anthracis*	Low	Low	40
Bordetella	*Bordetella bronchiseptica*	Medium	Low	40
Brucellosis	*Brucella abortus, B. mellitensis, B. suis, B. canis*	Low	Low	42

Campylobacteriosis	*Campylobacter jejuni and other Campylobacter spp.*	Medium	Low	43
Capnocytophaga	*Capnocytophaga canimorsus and C. cynodegmi*	Low	Low	44
Chlamydia	*Chlamydophila felis*	Medium	Low	45
Clostridium enteritis	*Clostridium perfringens, C. difficile*	Low	Low	46
Corynebacterium	*Corynebacterium felinum*	Low	Low	47
Feline bartonellosis	*Bartonella henselae*	Medium	Low	47
Feline infectious anaemia	*Mycoplasma haemofelis, M. haemominutum, and M. turicensis*	Low	Low	48
Feline respiratory Mycoplasma	*Mycoplasma felis*	Low	Low	49
Haemophilus felis	*Haemophilus felis*	Low	Low	50
Helicobacter	*Helicobacter felis, H. heilmanni,* and *other Helicobacter spp.*	High	Medium	51
Leptospirosis	*Leptospira spp.*	Medium	Low	52
Lyme disease	*Borrelia burgdorferi* and other *Borrelia spp.*	Medium	Low	53
Mycobacterial infection	*Mycobacterium tuberculosis complex, including M bovis, M microti,* and *M avium complex (MAC), and Feline leprosy caused by Mycobacterium lepraemurium*	Medium	Low	54
Pasteurellosis	*Pasteurella Multocida*	Medium	Low	56
Plague	*Yersinia pestis*	Low	Low	57
Protothecosis	*Prototheca wickerhamii* and *P. zopfii.*	Low	Low	58
Q fever	*Coxiella burnetiid*	Medium	Low	58
Salmonellosis	*Salmonella spp.*	High	Low	60
Streptococcus	*Streptococcus canis, S. equi zooepidemicus* and other *spp.*	Low	Low	61
Tetanus	*Clostridium tetani*	Medium	Low	62
Tick-bite fever	*Anaplasma phagocytophilum,* but also other *Anaplasma spp., Ehrlichia spp.* and *Rickettsia spp.*	Medium	Low	63
Tularaemia	*Francicella Tularensis*	High	Low	63
Tyzzer's disease	*Clostridium piliforme*	Low	Low	65
Yersiniosis	*Yersinia enterocolitica* and *Y. pseudotuberculosis*	Medium	Low	66
FUNGAL				
Adiaspiromycosis	*Emmonsia crescens*	Low	Low	67
Aspergillosis	*Aspergillus fumigatus, A. felis,*	Low	Low	67

Cryptococcosis	*Cryptococcus neoformans-Cryptococcus gattiispecies complex*	Low	Low	68
Encephalitozoonosis	*Encephalitozoon cuniculi*	Low	Low	69
Ringworm	*Microsporum canis* and other *dermatophyte spp.*	Medium	Low	70
PROTOZOANS				
Babesiosis	*Babesia pisicii* and *B. canis*	Low	Low	72
Coccidia	*Cystoisospora (Isospora) felis* and *C. rivolta*	Low	Low	73
Cryptosporidium	*Cryptosporidium felis*	Low	Low	74
Cytauxzoonosis	*Cytauxzoon europaeus, C. otrantorum, and C. banethi*	Medium	Low	75
Giardia	*Giardia duodenalis*	Medium	Low	76
Hepatozoonosis	*Hepatozoon silvestris* and *H. felis*	Low	Low	77
Leishmaniosis	*Leishmania infantum*	Low	Low	77
Neospora	*Neospora caninum*	Low	Low	79
Toxoplasmosis	*Toxoplasma gondii*	High	Low	79
Trichomoniasis	*Tritrichomonas foetus* and *T. blagburni*	High	Low	81
ECTOPARASITES				
Demodex otitis externa	*Demodex cati*	Low	Low	83
Ear mites	*Otodectes cynotis*	Low	Low	84
Fleas	*Ctenocephalides felis*	High	Low	84
Harvest mites	*Neotrombicula autumnalis*	Low	Low	85
Lice	*Felicola subrostratus*	Low	Low	86
Mange	*Sarcoptes scabiei*	Low	Low	87
Red mite	*Dermanyssus gallinae*	Low	Low	88
Ticks	*Ixodes ricinus, I. hexagonus/canisuga, Haemaphysalis erinacei and others*	Medium	Low	89
ENDOPARASITES				
TREMATODES (flukes)				
Biliary fluke	*Metorchis bilis*	Low	Low	91
Cat liver fluke	*Opisthorchis felineus*	High	Low	92
Liver fluke	*Pseudoamphistomum truncatum*	Low	Low	93
NEMATODES (roundworms)				
Aelurostrongylus	*Aelurostrongylus abstrusus*	Medium	Low	95
Bladder worm	*Capillaria plica* and *C. feliscati*	Low	Low	96
Capillariasis	*Capillaria Aerophila, C. putorii,* and other *spp*	Medium	Low	97
Cylicospirura	*Cylicospirura felineus , C. subaequalis, and C. petrowi*	Medium	Low	98

Dirofilaria	*Dirofilaria immitis*	Medium	Low	99
Eyeworm	*Thelazia callipaeda*	High	Low	100
French heartworm	*Angiostrongylus chabaudi and A. vasorum*	High	Low	101
Gastric worms	*Ollulanus tricuspis*	Medium	Low	102
Giant kidney worm	*Dioctophyma renale*	Low	Low	103
Hepatic capillariasis	*Capillaria hepatica*	Medium	Low	104
Hookworm	*Ancylostoma tubaeforme and Ancylostoma spp.*	Medium	Low	105
Stomach worms	*Physaloptera spp.*	Low	Low	106
Strongyloides	*Strongyloides felis, S. tumefaciens, S. planiceps and S. stercoralis*	High	Low	107
Toxascaris	*Toxascaris leonina*	Medium	Low	108
Toxocariasis	*Toxocara cati*	High	Low	110
Trichinosis	*Trichinella spiralis*	Low	Low	111
Troglostrongylus brevior	*Troglostrongylus brevior*	High	Low	112
Uncinaria stenocephala	*Uncinaria stenocephala*	Medium	Low	113
CESTODES (tapeworms)				
Cysticercosis	*Taenia hydatigena*	Low	Low	115
Diphyllobothriasis	*Diphyllobothrium latum*	Medium	Low	116
Echinococcosis	*Echinococcus multilocularis*	High	Low	116
Flea tapeworm	*Dipylidium caninum*	Low	Low	117
Hydatigera	*Hydatigera kamiyai*	Medium	Low	118
Joyeuxiella	*Joyeuxiella pasqualei*	Medium	Low	120
Mesocestoides	*Mesocestoides litteratus and M. vogae*	Medium	Low	120
Rabbit tapeworm	*Taenia pisiformis*	Low	Low	122
Sparganosis	*Spirometra spp.*	Low	Low	122
Taenia taeniaeformis	*Taenia taeniaeformis*	Medium	Low	123
ACANTHOCEPHALA (Thorny-headed worms)				
Acanthocephala	*Acanthocephala spp.*	Low	Low	125

Non-infectious Disease	Risk rating	Rating after mitigation	Page
INTOXICATION			
Anticoagulant rodenticides	Medium	Medium	126
Botulism	Low	Low	127
Carbamates and organphosphates	Low	Low	127
Dieldrin and other organochlorines	Low	Low	128
Ethylene glycol	Low	Low	128
Lead Toxicosis	Low	Low	129
Metaldehyde (slug pellets)	Low	Low	130
Pyrethrins and Pyrethroids	Low	Low	130
CONGENITAL/ DEVELOPMENTAL			

Heart disease	Medium	Low	132
Idiopathic epilepsy	Low	Low	132
Maternal neglect	High	Low	133
Portosystemic shunt	Low	Low	134
DEGENERATIVE			
Chronic kidney disease	Medium	Low	135
Degenerative Joint Disease	Low	Low	135
Dental disease	Medium	Low	136
Feline injection site sarcoma	Low	Low	137
Hyperthyroidism	Low	Low	138
Neoplasia	Medium	Low	139
Feline triaditis and pancreatitis	Medium	Low	140
ENVIRONMENTAL			
Hybridisation	High	High	140
Persecution	Low	Low	141
Inbreeding	Medium	Low	142
Road Traffic Accidents	Medium	Medium	143
Starvation	Medium	Medium	144
OTHER			
Antimicrobial resistance	Low	Low	144

Detailed Hazard Analysis

Viral diseases

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Aujeszky's disease (pseudorabies)	Suid herpesvirus 1	Low	Low

Hazard Description

The natural hosts are domestic and wild suids (pigs). In addition to suids, Aujeszky's disease virus (ADV) can infect a wide range of species, including wildcats and domestic, which are considered dead-end hosts, because they experience a fatal neurological disease of very short duration. ADV has been reported in a Florida panther (*Felis concolor cory*) and in an Iberian lynx (*Lynx pardinus*). The Iberian Lynx was assumed to be exposed to ADV by ingestion of tissues from wild boars. The disease is not currently present in the UK. The last outbreak in Great Britain was in 1989. Aujeszky's disease is a notifiable animal disease. The disease has been eliminated from pig populations of the UK and several European countries and only occurs very sporadically. There have only been small numbers of cases in France, Hungary, Czech Republic, and Finland in since 2019. In cat species the incubation period is short, no longer than 2 to 4 days. The outcome is invariably fatal, within 12 to 48 hours after onset of the clinical signs

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**

No - notifiable disease	No	Yes - AD has been reported in a Florida panther and in an Iberian lynx. The Iberian Lynx was assumed to be exposed to ADV by ingestion of tissues from wild boars	Source

Transmission pathways of concern:	
Cats are infected with ADV mainly through the ingestion of raw infected pork, particularly of lungs or other offal. Transmission can also be indirect, following viral excretion by pigs. In connection with an AD outbreak in sheep, cases in domestic cats have been also observed (Henderson et al, 1995). The risk for wildcats to catch the infection is extremely low	
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
Aujeszky's disease is a notifiable animal disease in the UK and is not present in the United Kingdom. While it would be of major economic concern should the disease occur in pigs, there is a negligible risk of captive or free-roaming wildcats being infected, the rapid fatal progression of the disease in felines, and wildcats being a dead-end host makes the risk negligible. Even in the highly unlikely event of an imported cat being affected it would not survive a 30-day quarantine period, as death would occur rapidly. Wildcats would be a dead-end host and pose no risk to other animals, such as domestic pigs or wild boar in the UK	Yes
Mitigations measures	**Mitigations advised**
All cats arriving at a captive breeding situation from outside the UK should have a 30-day quarantine period, even if not a requirement of the Balai directive. Feeding of raw pork products, especially from wild boar, in captivity in Europe should be avoided	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Avian influenza	Influenza A virus	High	Medium
Hazard Description			
Felids are susceptible to influenza virus infections from humans or animals, especially birds, which usually induce only subclinical infections or a mild fever. Feline upper respiratory tract diseases caused by influenza viruses appear to be rare and are usually self-limiting. However highly pathogenic avian influenza virus (H5N1) can be transmitted from poultry or wild birds to various cat species and induce a severe, generalised disease with a high fatality rate. Avian influenza is a notifiable disease in the UK, with periodic outbreaks mainly in winter in wild birds, farmed poultry,			

and zoo housed birds as well as wild and zoo mammals reported in recent years. High mortality events in captive tigers, leopards and other exotic felids have been reported in China and Thailand, where cats have been infected by the feeding of infected chickens. Infection in wild Lynx has been reported in Finland

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes, in numerous felid species kept in zoos, and in wild lynx in Finland	Captivity, Destination, Zoonotic

Transmission pathways of concern:

While respiratory infection with influenza virus is possible, the main risks appear to be from ingestion of wild birds infected with highly pathogenic strains of avian influenza, or possibly from eating affected rodents in an affected area, and from staff entry and exit (especially shoes). Transmission to humans would mainly be by inhalation or ingestion (hand hygiene) of the virus

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low. In the UK there are periodic outbreaks mainly in winter in wild birds, farmed poultry, and zoo housed birds and mammals reported in recent years. It is highly unlikely disease would be introduced by wildcat releases.	Medium

Consequences of introduction or exposure	**Mitigation possible**
In the UK there are periodic outbreaks mainly in winter in wild birds, farmed poultry, and zoo housed birds and mammals reported in recent years. It is highly unlikely disease would be introduced by wildcat releases. The main risk is to captive or released wild living wildcats from the ingestion of infected birds or possibly rodents, which could cause mortalities. There is a risk to captive wildcats if fed meat from affected poultry or they catch infected wild birds or affected rodents. A severe localised outbreak in wild birds could affect the viability of released populations if there is heavy exposure and resultant mortalities	Yes
Mitigations measures	**Mitigations advised**
Excellent biosecurity practices are essential during seasonal UK avian influenza outbreaks (mainly occurring over winter months annually). Boot cleaning, followed by disinfectant foot dips using Defra approved disinfectant at the concentration approved for avian influenza prevention should be in place year-round. During the occurrence of avian influenza in the UK captive wildcats should not be able to access or catch wild birds or scavenge any dead birds. Captive breeding facilities for wildcats (in contrast to pre-release habituation enclosures) should ideally be bird and rodent proof to further limit the risk of exposure. Covered roofing if mesh should be designed in such a way as to discourage any	Yes

perching of birds such as gulls that may defecate through the mesh into the wildcats' enclosures. Footwear must be changed when coming into and leaving the facility, and wildcat carers should not keep poultry at home, and should limit and log any contact with poultry or captive birds. Those working with wildcats when avian influenza is present in the UK must wear wellington boots to ensure adequate cleaning and then disinfection is possible. Enclosures and the surrounding area to the facility should be checked visually for any dead birds or rodents first thing in the morning, and any found removed using PPE and reported to management. Work patterns should be planned to limit any unnecessary entries into enclosures as each additional entry increased the risk of the virus being carried in. Cleaning and other equipment should preferably remain in enclosures and not be shared between different areas of a facility. Any non-animal staff or workers entering the site or wildcat enclosures must be directly supervised to ensure they disinfect adequately. Food spillage and waste needs to be limited as far as practicable to discourage wild birds and rodents, and when possible, food should be provided in covered areas, to reduce any wild bird or rodent feeding. Congregation of wild birds, especially ducks or gulls must be discouraged, such as preventing accumulations of standing water or similar	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Bluetongue	Bluetongue virus	Low	Low

Hazard Description

Bluetongue is a noncontagious, infectious, arthropod-borne viral disease primarily of domestic and wild ruminants, and of major livestock economic importance. It is a notifiable disease in the UK. Bluetongue virus is transmitted to ruminants by several species of Culicoides biting midges. Clinical infection and death caused by bluetongue virus infection has been reported in the Eurasian lynx (Jauniaux *et al*., 2008). Two lynxes had been fed ruminant foetuses and stillborn animals from surrounding farms, making oral transmission possible. On post-mortem examination the lynx demonstrated anaemia, emaciation, subcutaneous and petechial haemorrhages, and lung changes including congestion wind oedema. Bluetongue virus surveillance in the Iberian lynx revealed widespread and repeated exposure to serotypes 1 and 4 in wild and captive populations, although no signs of clinical disease (Caballero-Gómez *et al*., 2024). No other felid species have been reported as being affected, but this remains a theoretical possibility.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Eurasian lynx	Source, Carrier

Transmission pathways of concern:

Ruminants become infected from the saliva of a biting midge, however lynx have become infected from contact with infected ruminants caught as prey, implying a likely oral route of infection.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**

Low	Low

Consequences of introduction or exposure	**Mitigation possible**
There are no reports of disease in wildcats or domestic cats. It is possible that a wildcat consuming infected tissues from an animal afflicted with bluetongue could develop clinical disease die. Only individual wildcats consuming infected meat or tissues would likely be affected, and are unlikely to act as a meaningful source of disease for livestock	Yes
Mitigations measures	**Mitigations advised**
Captive wildcats should not be fed ruminant foetuses or stillborn animals while in captive care, as these appear the likely source of lynx infections	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
COVID	SARS-Coronavirus (CoV-2)	Medium	Medium

Hazard Description

Felids have been shown to be highly susceptible to infection with SARS-CoV-2, and there have been numerous reported cases of human-to-cat transmission of SARS-CoV-2 in COVID-19 households. Infected cats generally display mild respiratory signs and then recover, but virus can be shed from infected cats for up to one week. Infected cats develop neutralising antibodies. Kuhn *et al*. (2024) reported SARS-CoV-2 exposure in one European wildcat of 18 tested in Switzerland, a prevalence of 4.2%.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Captivity

Transmission pathways of concern:

COVID-19 transmission occurs when infectious particles are breathed in or come into contact with the eyes, nose, or mouth. The risk is highest when in close proximity, but airborne particles containing the virus can remain suspended in the air and travel over distances, especially indoors. Transmission can also occur by touching the eyes, nose or mouth after contact with surfaces or objects that have been contaminated. People remain contagious for up to 20 days and can spread the virus even if they do not develop symptoms

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
COVID currently circulates in the UK human population	Medium

Consequences of introduction or exposure	Mitigation possible
Infected cats generally display mild respiratory signs and then recover, but virus can be shed from infected cats for up to one week and infect people working with captive wildcats. The one reported wildcat with confirmed serological exposure in Switzerland examined at post-mortem, was not shedding virus and had no signs of disease	Yes
Mitigations measures	**Mitigations advised**
People with suspicion of COVID-19 should avoid contact with wildcats and observe good hygiene practices to prevent transmitting SARS-CoV-2 to captive wildcats. Animal workers testing positive for COVID should not work with captive wildcats until testing negative again. To prevent zoonotic transmission of SARS-CoV-2, personal protective equipment should include eye protection as well as a mask, a gown and gloves for any captive cats showing signs of respiratory disease	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Cowpox	Orthopoxvirus	Medium	Low

Hazard Description

Poxviruses are ubiquitous amongst mammals. “Cowpox” is a misnomer, as the virus occurs mainly as an inapparent infection in small rodents, which are considered the natural reservoir. The host spectrum is wide and includes cats and humans. Infection occurs sporadically, usually after contact with rodents, frequently in late summer to autumn. A survey in Germany found 17% of outdoor domestic cats had antibodies against Orthopoxviruses. Transmission between cats has been reported rarely. Skin lesions are predominantly found on the head and paws. They usually heal spontaneously, although occasionally more severe progressive proliferative ulcerations my occur. Cowpox can prove fatal in kittens and immunosuppressed cats. There is a zoonotic risk from contact with cats with lesions

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes	Destination, Zoonotic

Transmission pathways of concern:

Cases occur sporadically after contacts with wild rodents such as hunting prey. Infection in cats normally starts with head lesions inflicted by the struggling rodent and then spreads to other body parts, such as the paws and ears, spread by grooming. There is risk people can become infected from handling cats with lesions, or handling dead affected rodents (as food items for cats, or as part of rodent control measures)

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The virus is already widely present in wild rodents in the UK	High

Consequences of introduction or exposure	Mitigation possible
Released wildcats will hunt rodents as prey and so it is possible individuals may occasionally be affected, although not reported in the species yet. Domestic cats that are infected often only show mild skin lesions if any and usually heal spontaneously without any need for treatment. There is a risk of infection and the development of skin lesions in human workers handling wildcats in captivity or trapping after release for monitoring	Yes

Mitigations measures	Mitigations advised
People working with and handling wildcats during trapping for post-release monitoring, or handling rodents as food for captive wildcats should wear gloves to minimise any risk of zoonotic transmission to humans	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Feline Calicivirus (FCV)	Feline Calicivirus	High	Medium

Hazard Description

Feline Calicivirus is a common and highly contagious disease that only affects domestic and wild felids. It has a high prevalence and occurs worldwide in domestic, feral and wild felids. Mostly FCV-infected cats show painful erosions in the mouth and mild upper respiratory disease. FCV infection can also be associated with chronic gingivostomatitis or limping syndrome with shifting lameness in domestic cat. FCV infection can also lead to serious or even fatal diseases, particularly in kittens due to pneumonia, or when highly virulent FCV variants induce severe systemic disease, characterized by epizootic spread and high mortality. FCV is resistant to many disinfectants. A 20% prevalence was found in 132 samples of free-living feral and Scottish wildcat hybrids trapped by for disease screening and domestic feral cat trap neuter vaccinate release program (Bacon *et al.*, 2023)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

FCV is shed via oral and nasal secretions, but it is also detected in the blood, urine and faeces of infected cats. On recovery, many cats continue shedding, most of them for at least 30 days post-infection, and some will continue to shed virus life-long. Infection occurs through direct contact with

secretions from infected or carrier cats. The virus also survives in the environment and remains infectious for up to one month on dry surfaces at room temperature, and longer in colder conditions as well as damp conditions. Indirect transmission can occur, especially within the close confines of a breeding or holding facility, where secretions can contaminate cages, feeding and cleaning tools, or personnel. The virus can also remain infectious in flea faeces for up to eight days, and domestic kittens were experimentally infected with FCV by contact with infected fleas or their faeces (Mencke *et al*., 2009). FCV is resistant to many disinfectants, and people working with large groups of cats pose a specific risk and can inadvertently spread the disease even with washing and disinfecting procedures in place, if there are lapses (Deschamps *et al*., 2015)

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The infection is already widely present in the UK domestic and feral cat population	High

Consequences of introduction or exposure	**Mitigation possible**
Calicivirus poses a particular risk to facilities housing many cats, as the virus is resistant in the environment and to many disinfectants, and it is easily spread, so clinical disease doesn't only affect the health and welfare of individual cats. Once infected cats can potentially shed virus lifelong. Outbreaks can alter the function and viability of a captive breeding/release facility	Yes
Mitigations measures	**Mitigations advised**
Founder cats for captive breeding should be screened for the disease. FCV can best be detected by reverse-transcriptase PCR testing. However, a negative result does not rule out FCV infection and healthy cats can also sometimes test false positive. All cats should be vaccinated against FCV. Vaccination usually protects from severe disease but not from infection. Captive cats in groups are at particular risk and should be re-vaccinated annually. Immunity after infection is not life-long and does not protect against all strains, therefore continued vaccination of cats that have recovered from caliciviral disease is recommended. FCV is resistant to many disinfectants. The most effective disinfectants are based on sodium hypochlorite, potassium peroxy-monosulphate and chlorine dioxide. Keepers working with captive cats must realise that despite disinfection and biosecurity they remain an important risk for inadvertent transmission in captivity. PPE should be used should an outbreak in a captive facility occur. Chaning into and out of work cloths at the facility also reduces the risk from any domestic cats kept at keepers homes.	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline gammaherpesvirus	Felis catus gammaherpesvirus 1 (FcaGHV1)	Low	Low
Hazard Description			

Felid gammaherpesvirus 1 (Felis catus gammaherpesvirus 1; FcaGHV1) infections are endemic in the cat population. Knowledge of a role for human GHV in the development of lymphomas in immunodeficient patients with HIV was the trigger to investigate the existence of feline GHV in the development of lymphomas in FIV infected cats, as FIV infected cats are about five times more likely to develop lymphomas compared to uninfected cats. Studies so far do not support a role for FcaGHV1 in the development of lymphomas or other malignant tumours			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source
Transmission pathways of concern:			
Based on identified risk factors and associated co-infections, aggressive behaviour is a plausible mode of transmission between cats			
Likelihood of disease introduction or release		**Likelihood of exposure to the introduced wildcats**	
The virus is present in UK cats and is not associated with any disease in cats		Low	
Consequences of introduction or exposure			**Mitigation possible**
The virus is present in UK cats and is not associated with any clinical disease in cats			No
Mitigations measures			**Mitigations advised**
No mitigations are needed			No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline Immunodeficiency Virus (FIV)	Feline Immunodeficiency Virus	High	Medium
Hazard Description			
Feline immunodeficiency virus (FIV) is a retrovirus of the genus Lentivirus. Prevalence is variable, with estimates of 1 to 14% in domestic cats with no clinical signs and up to 44% in sick cats. Sick adult cats, male cats and entire cats are most likely to be infected, through the inoculation of saliva by bites during fighting. Most clinical signs are not caused by the virus, but by secondary infections, as a result of immunodeficiency. Common symptoms of affected cats include chronic gingivostomatitis, chronic rhinitis, lymphadenopathy, immune-mediated glomerulonephritis and weight loss. A 7% prevalence was found in 144 samples of free-living feral and Scottish wildcat hybrids trapped for disease screening and domestic feral cat trap-neuter-vaccinate-release program (Bacon *et al.*, 2023)			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**

Yes	Yes	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:
The main route of transmission is via the inoculation of saliva during fighting, by bites. Intact males are more affected. Transmission between domestic cats in established pairs or groups is uncommon, despite mutual grooming, mild aggression, and sharing food bowls, litter boxes and bedding. Transmission from mother to kittens may occur but only a proportion of the offspring become persistently infected

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The infection is already widely present in the UK domestic and feral cat population	Medium

Consequences of introduction or exposure	**Mitigation possible**
FIV is already present in domestic pet and feral cats throughout the UK. FIV does pose a health and welfare risk to individual wildcats if infected, but many infected cats can be asymptomatic and lead normal lives. Infected cats may develop immunosuppression, which can lead to chronic or recurrent infections. This can result in a decreased life expectancy	Yes
Mitigations measures	**Mitigations advised**
Founder cats for captive breeding must be screened for the disease before entering the program. While in domestic cats euthanasia of healthy seropositive cats is not recommended as they may live as long as uninfected ones, this approach is not recommended in wildcats for captive breeding and release, as this will raise prevalence in the small released population and could affect its long-term viability. Engagement with locals and stakeholders such as cat and animal welfare organisations for support for feral cat control to limit disease transmission risks in release locations from feral infected cats. There is no vaccination available in the UK. Release site selection to limit habitat overlap between released wildcats and feral domestic cats, and control of local feral domestic cat numbers and lobbying for more responsible domestic cat ownership, could reducing the feral domestic cat population and disease transmission risk to wildcats long-term	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline infectious peritonitis (FIP) and Feline enteric coronavirus (FECV)	Feline coronavirus (FCoV)	High	Medium

Hazard Description
Feline coronavirus (FCoV) is an RNA virus reported worldwide and known to cause disease in domestic and nondomestic felid species. It is mainly transmitted faeco-orally. FCoV is primarily an

enteric virus and most infections do not cause clinical signs or result in only mild to inapparent disease or enteritis, but a small proportion of FCoV-infected cats develop the fatal, systemic disease Feline Infectious Peritonitis (FIP). The pathology in FIP comprises a perivascular phlebitis that can affect any organ. Cats under two years old are most frequently affected by FIP. Cats may present with fever, anorexia, and weight loss. Many affected cats have effusions, and some have ocular and/or neurological signs. Making a definitive diagnosis in affected cats can be complex, despite FCoV antigen detection, as signs are non-specific and can be due to other diseases. FIP has been described in European wildcats

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Destination, Carrier

Transmission pathways of concern:

FCoV is a contagious virus. Faeces are the main source of FCoV infection with faecal-oral transmission. Kittens are often infected at a young age and shed FCoV in faeces as early as two days post-infection. After infection, shedding continues for days to months, and a few may be persistently infected. Shedding stops, or is intermittent, and can recur due to re-infection. Immunity is short-lived, and cats can undergo multiple cycles of infections. FCoV infection is common in groups of housed cats, but FIP arises in only a small percentage of FCoV-infected cats

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
FCoV infection is already widely present in the UK domestic and feral cat population, but only a small number of cats are affected to develop FIP	Medium

Consequences of introduction or exposure	**Mitigation possible**
FCoV is already widely present in domestic pet and feral cats throughout the UK. FIP does pose a health and welfare risk to a small number of individual wildcats, but only a small number of FCoV infected cats go on to develop the fatal, systemic disease Feline Infectious Peritonitis (FIP)	Yes
Mitigations measures	**Mitigations advised**
Founder cats for captive breeding must be screened for the disease before entering the program. Testing should be both via real-time PCR on faeces to check for viral shedding, as well as blood/serum submitted for antibody detection via immunofluorescence. Although most cats will not go on to develop FIP, wildcats testing positive on either test should be excluded from entry into the facility and breeding program to lower risk. Engagement with locals and stakeholders such as cat and animal welfare organisations for support for feral cat control to limit disease transmission risks in release locations from feral infected cats. Release site selection to limit habitat overlap between released wildcats and feral domestic cats, and control of local feral domestic cat numbers and lobbying for more responsible domestic cat ownership, could reducing the feral domestic cat population and disease transmission risk to wildcats long-term	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Feline leukaemia virus (FeLV)	Feline leukaemia virus	High	Medium

Hazard Description

Feline leukaemia virus (FeLV), is a gammaretrovirus of domestic cats and some closely related wild felids, with infections occurring worldwide. It is a member of the Orthoretrovirinae subfamily of retroviruses and contains a protein core with single-stranded RNA protected by an envelope. FeLV is serious disease of cat species. Infected cats have a decreased life expectancy but can be asymptomatic for many years. Asymptomatic carrier cats pose a serious risk to other cats they come into contact with. As the disease progresses, infected cats may initially show a variety of symptoms including weight loss, lethargy, poor fur coat and diarrhoea, before developing anaemia and immunosuppression, resulting in chronic or recurrent infections, and tumours such as lymphoma. A 3% prevalence was found in 146 samples of free-living feral and Scottish wildcat hybrids trapped for disease screening and domestic feral cat trap-neuter-vaccinate-release program (Bacon *et al.*, 2023). While the prevalence of FeLV in Europe has decreased thanks to vaccinations of domestic cats and testing, in some countries, particularly in southern Europe, FeLV prevalence rates up to 8.8% were still reported in a pan-European study

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

Transmission occurs mainly via saliva. This may be through friendly contacts, like grooming, but also via aggressive interaction, such as bites, and less frequently by sharing food bowls or litter boxes. Transplacental transmission and transmission through milk can occur. FeLV does not survive for long outside the host under dry conditions and is readily inactivated by disinfectants, soap, heating and drying. Although transmission via fomites is very unlikely, FeLV will retain infectivity and significant amounts of virus can survive for at least 48 hours if kept moist at room temperature

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The infection is already widely present in domestic and wild living feral cats in the UK	High

Consequences of introduction or exposure	Mitigation possible
FeLV is already present in domestic pet and feral cats throughout the UK. FeLV poses a notable health and welfare risk to individual wildcats. Common FeLV-associated diseases associated with progressive infection are tumours (particularly lymphoma), bone marrow suppression and anaemia, and immunosuppression, which can lead to chronic or recurrent infections. Cats with	Yes

progressive FeLV infection have a decreased life expectancy, but some cats can be asymptomatic. Stress can cause viral reactivation and progression of disease	
Mitigations measures	**Mitigations advised**
Founder cats for captive breeding must be screened for the disease, as well as all cats prior to release. All cats must be vaccinated annually against FeLV. As FeLV poses a serious health and welfare risk to individual wildcats if infected, any cats testing positive in captivity should be euthanised to reduce the risk to other wildcats and domestic cats. FeLV does not survive for long outside the host under dry conditions and is readily inactivated by disinfectants, soap, heating and drying. Although transmission via fomites is very unlikely, FeLV will retain infectivity and significant amounts of virus can survive for at least 48 hours if kept moist at room temperature. Good cleaning and disinfection is essential when cleaning captive enclosures. Engagement with locals and stakeholders such as cat and animal welfare organisations for support for feral cat control to limit disease transmission risks in release locations, which could affect wild born kittens to released wildcats. Release site selection to limit habitat overlap between released wildcats and feral domestic cats, and control of local feral domestic cat numbers either through culling, trapping and rehoming, or trap-neuter-vaccinate-release programs. As TNVR program findings in Scotland have shown additional options, potentially including the future use of legislation to encourage more responsible domestic cat ownership, would reducing the risk of the pet domestic cat population acting as a source for the feral domestic cat population and their disease transmission risk to re-established wildcats in the long-term	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline panleukopenia (Feline parvovirus, feline infectious enteritis)	Feline panleukopenia virus (Carnivore protoparvovirus 1)	High	Medium

Hazard Description

Feline panleukopenia virus (FPV), also referred to as feline parvovirus, feline infectious enteritis or carnivore parvovirus can cause severe disease in cats, particularly kittens once maternal antibodies have worn off. Diseased cats have a poor prognosis and less than 50 % of domestic cats survive even after intensive care treatment. FPV is shed in large amounts in the faeces of infected cats, and the virus is very stable and can stay infectious in the environment for months. In a survey of free-ranging wildcats and feral domestic cats in Portugal (Duarte *et al*., 2012) a prevalence of 6.9% of DNA was found in 20 stool samples

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination

Transmission pathways of concern:

Kittens are often infected at a young age and shed FCoV in faeces as early as two days post-infection. After infection, shedding continues for days, weeks or months, and a few may be persistently infected. Shedding then stops, or is detected intermittently, and can recur due to re-infection in an endemic environment. Immunity is short-lived, which is why cats, in the face of infection, can undergo multiple cycles of infections		
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**	
The infection is already widely present in domestic and wild living feral cats in the UK	High	
Consequences of introduction or exposure		**Mitigation possible**
FPV is already present in domestic pet and feral cats throughout the UK. FPV poses not only a notable health and welfare risk to individual wildcats (mainly kittens), but specifically a risk to captive facilities due to the long lasting and disinfectant-resistant nature of the virus once contamination has occurred. In already released wildcats the loss of kittens post weaning could adversely affect survival rates and population growth		Yes
Mitigations measures		**Mitigations advised**
FPV is very resistant to many commonly used chemical disinfectants. As it is highly contagious, susceptible animals may still become infected, even after a seemingly thorough disinfection of the premises. It is recommended that only already vaccinated wildcats should be brought into a captive breeding or release facility to remove risk of contamination and transmission. Vaccines provide a long lasting, likely lifelong immunity. Pre-movement disease testing (and vaccination) is mandatory of all cats before entering a captive breeding or release facility, to prevent any contamination of the facility. Efficacy tested disinfectants based on aldehydes, peracetic acid or sodium hypochlorite inactivate the virus. Engagement with locals and stakeholders such as cat and animal welfare organisations for support for feral cat control to limit disease transmission risks in release locations, which could affect wild born kittens to released wildcats. Release site selection to limit habitat overlap between released wildcats and feral domestic cats, and control of local feral domestic cat numbers either through culling, trapping and rehoming, or trap-neuter-vaccinate-release programs. Trap-neuter-vaccinate-release (TNVR) program findings in Scotland have shown additional options, potentially including the future use of legislation to encourage more responsible domestic cat ownership, would reduce the risk of the pet domestic cat population acting as a source for the feral domestic cat population and their disease transmission risk to re-established wildcats in the long-term		Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline Rotavirus	Rotavirus	Low	Low
Hazard Description			

Rotavirus A (RVA), a species of the Rotavirus genus and the family Reoviridae, can cause acute diarrhoea in the young of many animal species, including people. Although infections with feline rotaviruses (FRVs) rarely cause severe illness in cats, FRVs have captured attention as perpetuating, albeit infrequent, sources of human disease. Human RVAs with genetic homology to feline RVAs have also been isolated. A prevalence of 3% in over a thousand samples of faeces from domestic cats in catteries across the UK has been reported (German *et al*., 2015). Experimental infections in domestic cats have given inconsistent results, with some showing an association between rotavirus and reduced faecal quality (increased water content and suboptimal stool conformation) in kittens, while others failed to link infection with any disease signs such as diarrhoea. Currently, rotavirus is considered to play a minor role in clinical disease and is not routinely screened for in diarrhoea cases in domestic cat veterinary practices

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity, Zoonotic

Transmission pathways of concern:

Faeces are the main source of rotavirus infection with faecal-oral transmission.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The infection is already widely present in cats in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
Feline rotavirus is present in the UK and is considered to play only a very minor role in any clinical disease of domestic cats, and only rarely acts as a source for human disease	Yes
Mitigations measures	**Mitigations advised**
Good hand hygiene, disinfectants, and the use of gloves as PPE when cleaning cat faeces should alleviate any risk to humans or wildcats in captivity	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline spongiform encephalopathy	Pathogenic prion protein (PrPSc)	Low	Low

Hazard Description

Feline spongiform encephalopathy (FSE) is a neurodegenerative disease that affects the brain. This disease is caused by a normal prion protein (PrPC) misfolding after exposure to a pathogenic prion protein (PrPSc). Like Bovine spongiform encephalopathy (BSE), the disease can take several years to develop. It is believed that this condition is a result of felines ingesting bovine meat contaminated with BSE. The disease has previously affected domestic, captive, and wild species of felids. Clinical signs of FSE typically develop gradually in cats, ranging from several weeks to months. Initial signs

can include behavioural changes like aggression, timidity, hiding, progressing to gait abnormalities, ataxia, and other neurological abnormalities. Ataxia has been observed to last for about 8 weeks in affected cats. This disease was first reported in domestic cats within the United Kingdom in 1990, only four years after the first reports of BSE. Since 1990, while cases have been reported in other countries and other feline species in captivity, most affected felines originated in the UK. The average age of cats affected by this disease was 11 years of age, with the age range between 2–10 years. There is no evidence of any horizontal transmission under normal conditions between felines

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes (previously)	No	Yes	Captivity, Carrier,

Transmission pathways of concern:
It is believed that this condition is a result of felines ingesting bovine meat contaminated with BSE.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
BSE is now extremely rare worldwide, and risk of transmission to cats negligible. The average age of cats affected by this disease was 11 years of age, and there is no evidence of any horizontal transmission between cats. Even in the highly unlikely case a cat was infected there would be minimal risk, as a released wildcat is unlikely to live long enough in the wild to develop clinical disease	Yes
Mitigations measures	**Mitigations advised**
While current risk of Bovine spongiform encephalopathy (BSE) is negligible in the UK, captive wildcats should not be fed brain or spinal cords from cattle or sheep to eliminate any risks	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline syncytial virus	Feline foamy virus (FeFV or FFV)	Low	Low

Hazard Description
Feline syncytial virus or Feline foamy virus (FeFV or FFV) is a retrovirus and belongs to the family Retroviridae and the subfamily Spumaretrovirinae. This retrovirus is commonly found in cats. It is generally believed to be apathogenic and not result in any clinically significant disease. FeFV appears non-pathogenic as the virus is generally asymptomatic in affected cats and does not cause disease. However, some changes in kidney and lung tissue have been observed over time in cats affected with FeFV, which may or may not be directly affiliated. This virus is fairly common and infection rates gradually increase with a cat's age. Studies have shown that over 70% of felines over 9 years old were seropositive for Feline foamy virus results from antibody examinations and PCR analysis

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes	Carrier

Transmission pathways of concern:

FeFV has been identified in the saliva and transmission has been hypothesized to occur through biting and grooming behaviours.

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The infection is already present in cats in the UK and is believed to not cause any notable disease in cats.	Medium

Consequences of introduction or exposure	Mitigation possible
The infection is already present in cats in the UK and is believed to not cause any notable disease in cats.	No

Mitigations measures	Mitigations advised
No mitigations needed, as infection doesn't appear to cause any clinically significant disease in cats.	No

Infectious Disease	Agent	Risk rating	Risk after mitigation
Feline viral papillomatosis	Papillomavirus	Low	Low

Hazard Description

Papillomaviruses are small epitheliotropic viruses containing circular double-stranded DNA and belong to the family Papillomaviridae. The majority of cats are infected by PVs, but disease seems to occur less frequently compared to other domestic animals. Infections are associated with a variety of skin lesions and occasionally neoplasia, but the virus can also be found in normal skin. Lesions reported to be associated with PVs in domestic cats include skin and oral papillomas, hyperplastic skin plaques, and occasionally skin tumours such as squamous cell carcinomas. Cats most likely become infected through lesions or abrasions of the skin. Besides cat-specific PVs, DNA sequences most closely related to human and bovine PVs have been detected in feline skin lesions. There is no specific treatment for PV-induced skin lesions. Spontaneous regression commonly occurs

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes	Source, Destination, Carrier

Transmission pathways of concern:

Cats most likely become infected through lesions or abrasions of the skin	
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Papillomavirus infection is already widely present in cats in the UK	High

Consequences of introduction or exposure	**Mitigation possible**
The majority of cats are likely infected by Papillomavirus, but if signs do develop papillomas are most often mild and regress spontaneously without the need for treatment	Yes
Mitigations measures	**Mitigations advised**
All wildcats undergo a physical examination as part of screened for disease testing for inclusion in captive breeding and for release. This would detect any skin lesions of concern should they be present	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline viral rhinotracheitis (FVR) (Feline Herpes Virus (FHV))	Felid alphaherpesvirus 1	High	Medium

Hazard Description

The agent of the feline viral rhinotracheitis is distributed worldwide and affects domestic and numerous wildcat species. It belongs to the order Herpesvirales and is Felid alphaherpesvirus-1 (often simply referred to as Feline herpes virus). Another feline herpesvirus sometimes reported, Felid Gammaherpesvirus 1, is not related to FHV. The infection results in acute upper respiratory and ocular disease and is most severe in young kittens. Infected cats will remain as latent carriers, with future episodes of viral reactivation and shedding possible, particularly in stressful situations. A 7% prevalence was found in 141 samples of free-living feral and Scottish wildcat hybrids trapped by for disease screening and domestic feral cat trap neuter vaccinate release program (Alves *et al*., 2023)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Carrier

Transmission pathways of concern:

Infection occurs via the nasal, oral or conjunctival routes. After the acute phase of the disease, cats remain latently infected, and clinical signs and virus shedding can recur with reactivation. Viral shedding can also be asymptomatic. While transplacental infection hasn't been reported, latently infected queens can transmit FVR to their kittens, because birth and lactation are stressful, and can lead to viral reactivation and shedding. Kittens can therefore acquire FHV infection at an early age. The outcome of infection in young kittens depends on the presence of maternal-derived antibodies. With high levels, kittens are protected against clinical disease but will carry the virus as a latent infection. In cases with poor maternal-derived antibodies clinical disease can occur

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The infection is already widely present in the UK domestic and feral cat population	High

Consequences of introduction or exposure	Mitigation possible
FVR poses a particular risk to any facility housing many cats, especially breeding projects, due to the risk to young kittens.	Yes

Mitigations measures	Mitigations advised
Founder cats for captive breeding should be screened for the disease. The preferred method to detect FVR in biological samples is PCR and taking samples from different sites (conjunctival and oro-pharyngeal swabs) significantly increases the detection rate. Cellular immunity plays an important role in protection against the disease and antibody testing is not useful to predict protection. FVR vaccine is considered as a core vaccine. Only modified live and inactivated parenteral vaccines are available and there is no difference in efficacy regarding the disease. All the vaccines are combined with FCV. Maternal antibodies interfere with the response to vaccination until eight weeks of age on average in domestic cats. Two vaccinations at an interval of two to four weeks are generally recommended for primary vaccination, irrespective of the vaccine type. After the first annual booster, three-years interval boosters are often recommended in domestic cats when the risk of infection is considered as low. Experimental studies with domestic cats including challenge or antibody surveys shown that immunity against FHV usually lasts longer than one year. In domestic cat shelters or high-risk situations, annual boosters are often considered. It is recommended that captive wildcats are vaccinated annually. It is not known if cats that have recovered from acute disease caused by FHV might enjoy lifelong protection against new infections. Therefore, vaccination is still recommended even in cats that have been infected and recovered	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Rabies	Rabies virus (lyssavirus)	High	Low

Hazard Description
Rabies virus (RABV) is a member of the Rhabdoviridae family, causing a fatal progressive encephalitis in humans and other mammals, including cat species. Once symptoms of the disease manifest, it is untreatable and invariably results in death. The genus Lyssavirus contains 17 distinct species. RABV is the virus that causes rabies in a wide variety of species including dogs and cats. All lyssaviruses are generally considered to be capable of causing rabies-like disease in animals and humans, although infections of hosts other than bats have not been reported for all these viruses. With the exception of RABV, lyssaviruses are highly adapted and generally confined to bat hosts. Spill-over infections to other mammalian hosts are very rare incidences. In Europe, the red fox is the main reservoir species of rabies, but cases have been reported in European wildcat (Ciołek *et al.*, 2024). As a result of wildlife vaccination programs large regions in Europe became free of terrestrial rabies. The number

of annual human deaths is estimated at approximately 40,000 to 100,000 worldwide, and more than 15 million people receive post-exposure treatments after being exposed to suspected rabid animals. Rabid animals are the only source of virus. It is shed in the saliva some days before the onset of clinical signs, and the agent is transmitted through a bite or a scratch of the skin or mucous membranes (eyes, nose, mouth). The blood of rabid animals is not infectious. The UK is currently rabies free, and it is a notifiable disease. Currently most Western European countries from which wildcats could be sourced are classified as no risk by the UK government (https://www.gov.uk/government/publications/rabies-risks-by-country/rabies-risks-in-terrestrial-animals-by-country#g), but there are legal requirements that apply to imports of mammals including cats into the UK from Europe that further mitigate any risk

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No- notifiable disease	Yes, in Poland	Yes	Source

Transmission pathways of concern:

Rabid animals are the only source of virus. It is shed in the saliva some days before the onset of clinical signs, and the agent is transmitted through a bite or a scratch of the skin or mucous membranes (eyes, nose, mouth). The blood of rabid animals is not infectious.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Negligible risk of introduction if following legal requirements of animal importations from Europe	Low

Consequences of introduction or exposure	**Mitigation possible**
The UK is a rabies free country, and introduction of the disease would have serious consequences for human, domestic, and wild animal health	Yes
Mitigations measures	**Mitigations advised**
The Balai Directive (Article 4 of Council Directive 92/65/EEC) sets out the conditions for the import and export of animals such as wildcats, between European Union member states. For wildcats captive in an approved centre under the directive for over 120 days a rabies quarantine waiver can be applied for so official Animal and Plant Health Agency (APHA) quarantine and inspections are not needed. An animal health certificate for import, completed by an official veterinarian from the country of export, as issued by APHA is still needed. Any European wild origin/trapped wildcats have to legally undergo 120 days quarantine at a Balai approved centre either in the country of origin or in an APHA approved centre in the UK (https://www.gov.uk/government/publications/balai-directive-approved-premises) under inspection by APHA. After this quarantine the wild origin wildcats would legally be able to be moved with permission to other facilities, such as a captive breeding facility. Any captive bred wildcats from Europe from a non-approved centre would have to undergo the same legal 120 days quarantine as wild caught cats. No matter their origin, any wildcats imported from Europe should be vaccinated according to the vaccine manufacturers	Yes

current recommendations with an inactivated or recombinant vaccine that's approved in the country of use. The cat must be at least 12 weeks of age before vaccination, and import should only be 21 days or more after completion of primary rabies vaccination	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Staggering disease	Borna disease virus 1 (BoDV-1) and Rustrela virus (RusV)	Low	Low

Hazard Description

Staggering disease is a rare central nervous syndrome in domestic cats, characterized by abnormal gait, ataxia progressing to paralysis, lower back pain and behavioural changes. Borna disease virus 1 (BoDV-1) was believed to be the cause of staggering disease, with shrews (*Crocidura leucodon*) as the reservoir host. More recent evidence now suggests that the recently described Rustrela virus (RusV) is likely the aetiological agent, with mice (*Apodemus sylvaticus*, *Apodemus flavicollis*) likely acting as reservoir hosts for Rustrela virus. Rustrela-like virus infections have also been described in various rodents, bats, large cats, a donkey, an otter, a coati, and a wallaby. The disease has not been reported in wildcats

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source, Destination

Transmission pathways of concern:

The mode of transmission is unclear, but might be through direct contact, or indirectly via the secretions of an infected animal

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
These viruses are present in the wild rodent populations in the UK	Low

Consequences of introduction or exposure	**Mitigation possible**
Considering the disease is rare in domestic cats despite the widespread presence of host rodents in the UK and Europe, the risk to released wildcats is deemed very low	No
Mitigations measures	**Mitigations advised**
All wildcats undergo a physical examination and behavioural monitoring as part of screening inclusion in captive breeding and for release. This should detect any neurological abnormalities should they be present	No

Infectious Disease	Agent	Risk rating	Risk after mitigation
West Nile Virus	West Nile Virus	Low	Low

Hazard Description

West Nile virus (WNV) is a zoonotic mosquito-borne virus belonging to the family Flaviviridae, genus Flavivirus in the Japanese encephalitis antigenic group. WNV has a broad host range, mainly birds and mosquitos, but also mammals, including humans and cats. It can cause disease in humans, horses and several species of birds, depends on the infecting virus strain. Disease is uncommon in wild and domestic animals, but has been incidentally reported in alpacas, sheep, reindeer, dogs and also cats. Clinical signs or mortality are rarely reported in cats. After experimental infection of cats, mild, nonspecific signs including lethargy and loss of appetite have been observed. West Nile virus is currently absent in the UK, and is a notifiable disease, but the Culex mosquito vector is now present, and the disease may become established in the UK in coming decades with climate change. Locally acquired WNV infection has not been reported in the UK, although there have been occasional cases of travel-associated infection. The first large outbreak in Europe occurred in Romania in 1996. Cases have been identified in several countries across Europe including France, Italy, Germany, Portugal and Spain. Most infections in humans are asymptomatic (80%). In those who develop symptoms, patients mainly present with a mild flu-like febrile illness, sometimes called West Nile fever. However, a small proportion (less than 1%) of those infected will develop more severe disease – usually encephalitis, meningitis or meningo-encephalitis

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
No- notifiable disease	No	Yes	Source, Zoonotic

Transmission pathways of concern:

Infection in cats occurs through mosquito bites or ingestion of infected small mammals or birds

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Low	Low

Consequences of introduction or exposure	Mitigation possible
Birds are the main reservoirs of the virus and it relies on transmission via the bites of Culex mosquitos. Locally acquired WNV infection has not been reported in the UK, although there have been occasional cases of travel-associated infection. While Culex mosquitos are now present in the UK since 2010, humans are mainly infected with WNV through the bite of mosquitos, infected through blood of infected birds, the natural hosts of the virus. Infected cats are not considered a direct source of infection for humans. Current European WNV strains cause no or rarely minimal clinical signs in cats and pose little risk to wildcats themselves	Yes
Mitigations measures	**Mitigations advised**

Mosquito control at European country facilities holding wildcats for import as a source population for captive breeding are recommended. A commercial vaccine for cats is not available	Yes

Bacterial diseases

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Anthrax	*Bacillus anthracis*	Low	Low

Hazard Description
Anthrax is a noncontagious zoonotic disease caused by the spore-forming bacterium *Bacillus anthracis*. Anthrax primarily affects domestic and wild herbivores. Carnivores appear naturally resistant to Anthrax, and disease is very rarely reported in felids (Orr *et al*., 1978). Anthrax is a notifiable disease in the UK, and the last outbreak in livestock occurred in 2015.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes, zoo felids and domestic cats	Destination

Transmission pathways of concern:
Spores of *B. anthracis* can remain viable in soil for many years but rarely pose a direct risk to carnivores like cats. Infection may occur after contact with an infected carcass, or ingestion of tissues from an infected animal that has died of the disease, but high spore exposure is needed for infection of carnivores.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Anthrax is present in the UK, but outbreaks are rare. It is highly unlikely that a wildcat could ever spread the disease	Low

Consequences of introduction or exposure	**Mitigation possible**
Should an anthrax outbreak occur it is highly unlikely but possible that an individual released wildcat could come into contact with a carcass of a dead infected animal, and get infected by the cutaneous form, or if ingesting infected tissues the gastrointestinal form which could be fatal to the individual wildcat. Wildcats are highly unlikely to play any meaningful role in an outbreak's epidemiology	Yes
Mitigations measures	**Mitigations advised**
Vaccines are available for livestock and humans but are not indicated in wildcats due to the negligible risk. Anthrax is a notifiable disease in the UK, and any suspected cases must be reported.	No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Bordetella	*Bordetella bronchiseptica*	Medium	Low

Hazard Description			
Bordetella bronchiseptica (Bb) is a primary pathogen of cats, and the bacterium is shed in oral and nasal secretions of infected cats. A wide range of respiratory signs have been associated with Bb infection, from mild upper respiratory signs to those of severe pneumonia with dyspnoea, cyanosis and potentially death, especially in young kittens. While an intranasal modified live vaccine is available, routine vaccination is not recommended as this will not be protective against future infections (as may occur after releases). Zoonotic infections have been incidentally recorded in the literature, but appear rare, and mainly in immunocompromised individuals. A 12% prevalence was found in 141 samples by PCR of free-living feral and Scottish wildcat hybrids trapped for disease screening and domestic feral cat trap-neuter-vaccinate-release program (Bacon *et al*., 2023).			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Captivity
Transmission pathways of concern:			
Bordetella bronchiseptica is shed in oral and nasal secretions of infected cats. Cats can catch Bb infection from dogs with kennel cough			
Likelihood of disease introduction or release		**Likelihood of exposure to the introduced wildcats**	
Bordetella is widely present in the UK, with a high prevalence in cats		High	
Consequences of introduction or exposure			**Mitigation possible**
While most infected cats only show mild disease, in young kittens infection can cause severe pneumonia and even deaths. Zoonotic infections have been incidentally recorded in the literature, but appear rare, and mainly in immunocompromised individuals working with ill cats			Yes
Mitigations measures			**Mitigations advised**
Bordetella is susceptible to common disinfectants. Control of Bb in captive wildcats groups should be aimed at minimising the exposure of naïve cats, particularly young kittens who are more likely to be severely affected by infection. In the case of an outbreak stocking densities need to be reduced and the environment cleaned and disinfected to minimize the risk of transmission. Measures used to control other common respiratory pathogens, such as FCV and FHV, in groups of captive wildcats will also help control Bb infection and disease. Vaccination may be considered in the case of an outbreak in a wildcat breeding or holding facility to reduce disease incidence and severity, but routine vaccination is not recommended. Since the infection generally causes only mild disease, vaccination will not be protective against future infections, such as may occur after release. Vaccines can occasionally induce mild clinical signs. Bb vaccines containing viable bacteria should never be administered to kittens less than 4 weeks of age. Vaccines are also ineffective in cats on antibiotic treatment. Cats receiving live vaccines will shed bacteria. Since the Bb vaccine contains live bacteria there is a potential risk of infection during administration of the vaccine			Yes

or indirectly through contact with a vaccinated cat during the post vaccination shedding period. Vaccines can hence prove a zoonotic risk to immunocompromised humans. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Brucellosis	*Brucella abortus, B. mellitensis, B. suis, B. canis*	Low	Low

Hazard Description

Brucellosis is a zoonotic disease of livestock and human public health importance. Brucellosis is a notifiable disease in the UK. It is caused by bacteria of the genus *Brucella*, which are small, Gram-negative, nonmotile, nonspore-forming, rod-shaped bacteria. They function as facultative intracellular parasites, causing chronic disease, which usually persists for life. It is characterized by abortion, retained placenta, orchitis and infection of the accessory sex glands in males, and normally affects cattle, bison, pigs, sheep, goats, dogs, elk, and occasionally horses. In humans, *Brucella* infection causes undulant fever. Human cases mainly occur from consumption of unpasteurised milk and dairy products. A small number of exposure cases have been described in domestic cats, and a single case of *Brucella abortus* has been described in a puma, which showed no signs of illness. *B. abortus* was identified in a domestic cat with open pyometra housed on a cattle farm. While never reported, there is a very small risk that wildcats could act as a symptomatic carriers for *Brucella*. A study of cat flea droppings found a small number of fleas positive for *B. melitensis,* likely due to contact with wild rodents. The proximity of cats and their fleas with humans and previous observations of flea potential to transmit *B. melitensis* in laboratory animals pose a small theoretic risk to human workers, should a captive wildcat be infected (Dougas *et al*., 2020)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes- but a notifiable disease	No	Yes, domestic cats and a puma	Source, Destination, Zoonotic

Transmission pathways of concern:

Animals normally become infected by venereal transmission. The organism is found in blood, urine, milk, and semen. In humans infection usually occur from the consumption of unpasteurised milk and dairy products. Humans and potentially wildcats can become infected if they have contact with an infected animal or its tissues or raw byproducts.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
Wildcats are highly unlikely to become infected, but there is a small risk if they come into contact with infected rodents, mainly in proximity to farms where there	Yes

is infection of livestock. There is a small risk an infected wildcat could pass infection on to livestock or humans. Infection is likely to only affect an individual wildcat should it occur.	
Mitigations measures	**Mitigations advised**
All wildcats must undergo a detailed physical examination and behavioural monitoring as part of screening inclusion in captive breeding and for release. This should help detect any clinically significant abnormalities should they be present. Any deaths or abortions should undergo full diagnostic investigation. Testing of all asymptomatic wildcats in captivity for Brucellosis does not appear warranted at present	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Campylobacteriosis	*Campylobacter jejuni* and other *Campylobacter* spp.	Medium	Low

Hazard Description

Campylobacter can cause a gastrointestinal infection, campylobacteriosis, in animals including cats and humans. The incubation period is 24–72 hours after infection. Infections may be asymptomatic in many animals, but if infection does cause disease, the signs are gastrointestinal, including diarrhoea, bloody stools, abdominal cramps, fever, and pain. Symptoms typically last 5–7 days. The infection is usually self-limiting and, in most cases, treatment with antibiotics has only a minor effect on the typical duration of the infection in non-complex cases, and is discouraged except in high-risk immunocompromised patients

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source, Captivity, Carrier, Zoonotic

Transmission pathways of concern:

The route of transmission is faecal-oral, by ingestion of contaminated food or water, or the eating of raw contaminated meat, especially raw chicken. *Campylobacter* is sensitive to the stomach's normal production of hydrochloric acid, so the infectious dose is relatively high

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Campylobacter is widespread in asymptomatic domestic and wild animals in the UK, and common in raw chicken	Medium

Consequences of introduction or exposure	**Mitigation possible**
The disease poses a low risk to wildcats, but cleaning and handling wildcats, as well as handling raw food items such as chicken and rodents for the wildcats all	Yes

pose a risk of human infection. This is normally self-limiting enteritis but can be more serious in immunocompromised people.	
Mitigations measures	**Mitigations advised**
All animal workers having contact with cat faeces or raw diets have an occupational risk of exposure to *Campylobacter* and should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Capnocytophaga	*Capnocytophaga canimorsus* and *C. cynodegmi*	Low	Low

Hazard Description

The genus *Capnocytophaga* belongs to the Flavobacteriaceae family and contains several species. They are facultative anaerobic, gram-negative, rod-shaped, fastidious, slow growing, capnophilic bacterium. *Capnocytophaga canimorsus*, *C. cynodegmi*, *C. canis*, *C. stomatis* and *C. felis* are part of the oral microbiota of cats. All can cause wound infections in humans after a bite or cat scratch, *C. canimorsus* being associated with more severe infections. Serious disease has been reported especially, but not solely, in immunocompromised and alcoholic humans. Other comorbidities such as smoking, splenectomy, diabetes mellitus are associated with zoonotic *Capnocytophaga* infection. Most reported cases occur in immunocompromised people after a dog bite. Clinical disease ranges from an infected local wound to sepsis, meningitis, nephritis, osteomyelitis, endocarditis, peritonitis, pneumonia, purulent arthritis, abscesses and disseminated intravascular coagulation. Most cases have been related to contact with dogs but infection after cat bites or scratches has also been described. Based on incidence surveys, the zoonotic potential is generally regarded as low. Disease in cats is not well documented, but two cases of respiratory infection in domestic cats have been associated with presence of the bacteria

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Zoonotic

Transmission pathways of concern:

Capnocytophaga are normal oral flora in cats, and can be transmitted to humans after a bite or cat scratch

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The bacteria is part of the normal feline oral microbiome and already present in the UK	High

Consequences of introduction or exposure	Mitigation possible
Based on incidence surveys, the zoonotic risk is generally regarded as low, but serious disease is more likely in immunocompromised humans, or those with diseases or comorbidities including alcoholism, smoking, splenectomy, diabetes mellitus. Disease in wildcats is highly unlikely	Yes
Mitigations measures	**Mitigations advised**
Capnocytophaga poses a zoonotic risk to immunocompromised humans. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species. Adequate PPE such as protective gauntlets or other means should be used when handling cats to prevent injuries such as scratches that may become infected	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Chlamydia	*Chlamydophila felis*	Medium	Low

Hazard Description

Chlamydia (C.) felis is a Gram-negative bacterium that is an obligate intracellular parasite of cats. Chlamydial disease typically affects young cats. It manifests in ocular signs, initially often only affecting one eye, then bilaterally, with conjunctivitis, hyperaemia of the nictitating membrane, blepharospasm, ocular discharge, which is initially serous before becoming mucopurulent, and chemosis. A 2% prevalence was found in 136 samples of free-living feral and Scottish wildcat hybrids trapped for disease screening and domestic feral cat trap-neuter-vaccinate-release program (Bacon *et al*., 2023)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Carrier

Transmission pathways of concern:

C. felis does not survive outside of the host so close contact between cats is required for transmission, usually via ocular discharges

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The disease is already present in cats in the UK	Medium

Consequences of introduction or exposure	Mitigation possible
Treatment will mitigate disease in captive wildcats, but young cats under the age of 9 months old are more affected, and infection is transmissible in captive wildcat groups. Post-release the disease may affect individual wild born wildcats if	Yes

exposed, but depending on their age the majority should recover and not affect population viability	
Mitigations measures	**Mitigations advised**
While *C. felis* is regarded as a non-core vaccine for domestic cats, vaccination is recommended in captive wildcat facilities to limit any spread of disease should it enter the facility.	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Clostridium enteritis	*Clostridium perfringens*, *C. difficile*	Low	Low

Hazard Description

Clostridium difficile is a large, gram-positive, anaerobic, spore-forming motile rod and is a major cause of antimicrobial-associated colitis in humans. *C. difficile* associated diarrhoea and disease develops spontaneously in a variety of other species, including cats. *C. perfringens* type A has been reported as causing disease in cats. Alpha toxin production is associated with gas gangrene, traumatic infections, and necrotic enteritis. Most infected cats are asymptomatic, but some cases are associated with self-limiting diarrhoea. *Clostridium* in the gastrointestinal tracts of asymptomatic cats may act a source for zoonotic infection of humans.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Carrier, Zoonotic

Transmission pathways of concern:

Transmission is faeco-oral in nature

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
There is a risk of an individual cat becoming affected and requiring treatment, but the main risk is to workers with wildcats who may get enteritis	Yes
Mitigations measures	**Mitigations advised**
All animal workers should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection. Handwashing with soap and water is preferred over the use of alcohol-based hand sanitizers because spores of *C. difficile* and *C. perfringens* are alcohol-resistant, but susceptible to bleach (1:10 to 1:20 dilution of regular household bleach) and accelerated hydrogen peroxide.	Yes

Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Corynebacterium	*Corynebacterium felinum*	Low	Low

Hazard Description

Corynebacterium are gram positive aerobic bacilli. *Corynebacterium* occur widely as part of the normal microbiome in many mammals, also some can cause disease, often opportunistically. *Corynebacterium* species occur commonly in nature in soil, water, plants, and food items. Some species are known for their pathogenic effects in humans and other animals. A single case is described where *Corynebacterium felinum* was identified as a new species after isolated from a Scottish wildcat that had died from cat flu (calicivirus/herpes virus infection). The actual clinical significance is currently unknown but appears low

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	No	Carrier

Transmission pathways of concern:

Transmission is likely feco-oral in nature

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low, already described in wildcat in the UK	Unknown, likely low

Consequences of introduction or exposure	**Mitigation possible**
As only one instance of the organism's isolation from a felid has been reported the actual clinical significance is currently unknown but appears low.	Yes
Mitigations measures	**Mitigations advised**
All animal workers having contact with cat faeces or raw diets should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline bartonellosis	*Bartonella henselae*	Medium	Low

Hazard Description

Bartonella are small, vector-transmitted Gram-negative intracellular bacteria. Over 22 *Bartonella* species have been described, several in European wildcats, but the most common species in domestic cats and humans is *B. henselae*, which causes cat scratch disease (CSD) in people, a self-

limiting regional lymphadenopathy. The disease can manifest in more severe even fatal disorders in immunocompromised people. Most cats naturally infected by henselae do not show any clinical signs, but rarely some individual domestic cats can develop life-threatening cardiovascular diseases and possibly other pathologies associated with generalized lymphadenopathy. *Bartonella* have a higher prevalences where there are favourable conditions for fleas exist, which are the main vector

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Zoonotic

Transmission pathways of concern:

Fleas are the main vector for the transmission of *Bartonella henselae* among cats and can transmit the infection to people. People can also get the infection, as the common name suggests, by being scratched or bitten by cats

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Bartonella are widespread in cats in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
Bartonella infection poses minimal risk to wildcats, but carries a zoonotic risk to people working with wildcats, and particularly any people who are immunocompromised	Yes
Mitigations measures	**Mitigations advised**
Good flea control is the mainstay of limiting the zoonotic risk from *Bartonella* and transmission between cats. This should consist of both on-cat treatments, as well as periodic treatment of the enclosure environment. *Bartonella* poses a particular zoonotic risk to immunocompromised humans. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species. Adequate PPE such as protective gauntlets or other means should be used when handling cats to prevent injuries such as scratches that may become infected	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline infectious anaemia	*Mycoplasma haemofelis M. haemominutum*, , and *M. turicensis*	Low	Low

Hazard Description

Haemoplasmas are bacteria that attach themselves to the surface of red blood cells and can induce haemolysis, sometimes resulting in anaemia. *Mycoplasma haemofelis* is the most pathogenic of the three feline haemoplasma species. *Mycoplasma haemominutum* and *M. turicensis* infections are less pathogenic but can result in disease, especially in immunocompromised cats or cats with concurrent disease. Most of the clinical signs of haemoplasmosis such as lethargy, weakness,

collapse, depression, pallor, tachycardia, dyspnoea, hepatosplenomegaly, lymphadenopathy, dehydration, pyrexia, weight loss, pica, and icterus are due to anaemia or systemic inflammation. Cats chronically infected with haemoplasmas do not usually show clinical signs of infection, and subclinical infections can exist for all three feline haemoplasma species. Prevalence in Germany from road-killed wildcats was 7% in 96 wildcats, and prevalence in wildcats in France was linked with immunosuppressive diseases such as feline leukaemia virus. In the UK a prevalence of approximately 10% in domestic cats has been found

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Carrier

Transmission pathways of concern:
The natural mode of transmission of haemoplasma infection is not certain. Aggressive interactions and vertical transmission are possible routes. The evidence for transmission by vectors is poor.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Medium

Consequences of introduction or exposure	**Mitigation possible**
Individual wildcats may possibly be affected, especially if also infected by other diseases causing immunodepression such as FIV or FeLV.	Yes
Mitigations measures	**Mitigations advised**
All wildcats entering the captive breeding program or being prepared for release must undergo a full health examination including full haematology. This would detect any signs of anaemia that could be investigated further and Haemoplasmas diagnosed via PCR.	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Feline respiratory Mycoplasma	*Mycoplasma felis*	Low	Low

Hazard Description
Mycoplasmas are the smallest prokaryotic organisms with the smallest genomes that can grow in cell-free culture medium. *Mycoplasma felis* is a non-haemotrpic species and may be part of the normal respiratory flora of cats and has been identified in cats with clinical signs or in healthy cats living with infected animals. *M. felis* is typically associated with upper respiratory tract diseases but sometimes also with lower respiratory tract infections. *M. felis* has been associated to other pathologies as pyothorax, conjunctivitis, keratitis and mono- or polyarthritis

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**

Yes	No	Yes	Source, Captivity, Carrier

Transmission pathways of concern:
M. felis is transmitted directly from the infected cat to the in-contact one by aerosol. Indirect transmission is not important, because mycoplasmas are not able to survive for a long time outside the host

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
M. felis is present in the feral cat population in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
Mycoplasma may exacerbate an outbreak of respiratory disease in captive wildcats in a breeding or pre-release facility, requiring treatment and isolation	Yes
Mitigations measures	**Mitigations advised**
Mycoplasma may be normal respiratory flora in many cats and can be difficult to diagnose on laboratory testing. No vaccine is currently available. The prevention of *Mycoplasma* infections is based on the control of other or concurrent infections and good biosecurity, hygiene and disinfection and stress-limitation in groups of captive cats	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Haemophilus felis	*Haemophilus felis*	Low	Low

Hazard Description
Haemophilus felis is a gram-negative, pleomorphic, coccobacilli bacteria belonging to the family Pasteurellaceae. *Haemophilus* appears to be a normal oronasal and upper respiratory tract commensal organism in cats but has very rarely been reported as an opportunistic pathogen causing rhinitis and respiratory tract disease in domestic cats. It may be a component in respiratory tract disease caused by other organisms such as Pasteurella and calicivirus and herpes viral infections

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Carrier

Transmission pathways of concern:
Haemophilus felis is a normal commensal organism in cats oronasal and upper respiratory tracts, but very rarely has been associated with upper respiratory tract disease

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**

The organism is present as normal respiratory and oral flora in cats in the UK	Low

Consequences of introduction or exposure	**Mitigation possible**
In rare cases and individual cat may manifest signs of upper respiratory tract disease, but this appears more likely if not immunocompetent, or affected by other respiratory tract infections	No
Mitigations measures	**Mitigations advised**
This organism's is normal flora and only very rarely causes any symptoms or disease	No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Helicobacter	*Helicobacter felis, H. heilmanni*, and other *Helicobacter* spp.	High	Medium

Hazard Description

Helicobacter felis and *H. heilmanni* are Gram-negative, microaerophilic, urease-positive, and spiral-shaped bacterial species in the Helicobacteraceae family, Campylobacterales order. *Helicobacter* spp. from cats are potentially zoonotic as they have been isolated from infected humans, causing gastrointestinal tract diseases such as stomach inflammation, stomach and duodenal ulcers, stomach cancers and gastrointestinal lymphomas. *Helicobacter* are also associated with the development of bile duct cancer in humans. *Helicobacter* spp. are frequently found in the stomachs of both healthy and vomiting cats, however, their significance is not well defined. Although *H. pylori* infections in humans have been linked to gastritis and a higher rate of gastric neoplasia, similar direct causative relationships between *Helicobacter* infections and GI disease have not been established in cats. Whether *Helicobacter* infections can be transmitted between groups of cats is unclear, and reservoir hosts have not been defined. Because of the increased rates of morbidity and mortality associated with *Helicobacter* infections in humans, concerns about zoonotic transmission need consideration. It is estimated that about two-thirds of the world's population were infected with *H. pylori* infection, although prevalence is higher in developing countries. One quarter of 89 captive Scottish wildcats examined at post-mortem had gastritis with associated *Helicobacter*-like organisms, often combined with pancreatitis or cholangiohepatitis, and further elucidation of its significance in wildcats is needed

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes, reported in a variety of exotic felids species in captivity.	Source, Captivity, Carrier, Zoonotic

Transmission pathways of concern:

Whether feline *Helicobacter* spp. like *H. felis* and *H. heilmann* infections can be transmitted between groups of cats is unclear, and reservoir hosts have not been defined. Because of the increased rates

of morbidity and mortality associated with *Helicobacter* infections in humans, concerns about zoonotic transmission need consideration. *Helicobacter pylori* is contagious in humans and is transmitted through direct contact either with saliva or less commonly, faeces, via the faecal–oral route). The bacteria have been isolated from faeces, saliva, and dental plaque. *H. pylori* may also be transmitted by consuming contaminated food or water	
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Helicobacter infections are common and widespread in domestic cats in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
Prevalence in domestic and wildcats appears high, and is mainly asymptomatic, but there here is a risk of an individual cat becoming clinically affected and requiring treatment. The main risk, although theoretical, is to workers with wildcats who may get infected with feline *Helicobacter* species	Yes
Mitigations measures	**Mitigations advised**
As with all faeco-orally transmitted zoonotic diseases of cats, animal workers should exercise appropriate hygienic precautions, such as wearing gloves when cleaning enclosures, handling cats and when handling food, and good hand washing and utensils and surface disinfection is required. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species. Diagnosis of *Helicobacter* in cats is unfortunately invasive, involving upper gastrointestinal tract endoscopy under anaesthesia for sampling for brush cytology or histology on multiple gastric biopsies. Non-invasive tests for *Helicobacter* infection such as urea breath testing, faecal antigen detection, and serological testing have been used in research studies, but these non-invasive tests are not commercially available. Currently only invasive diagnostics are required for cats showing clinical signs of gastrointestinal disease such as vomiting that may be consistent with *Helicobacter* infection is indicated. Screening of otherwise healthy cats is not warranted unless non-invasive testing becomes available	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Leptospirosis	*Leptospira* spp.	Medium	Low
Hazard Description			
Leptospira species (spp.) infection can cause leptospirosis, a bacterial disease affecting a variety of domestic and wild animals and humans worldwide. *Leptospira* infection in cats is common, and cats usually acquire the infection from hunting rodents. While disease from *Leptospira* in cats is uncommon some cats do present with clinical signs of illness (leptospirosis). Subclinically infected cats appear healthy and act as carriers and can be a potential source of infection for incidental hosts, including humans and other animals. Cats can shed *Leptospira* in their urine contaminating a captive environment			

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Zoonotic

Transmission pathways of concern:

Infected cats can shed viable leptospires in their urine. Infection occurs via direct contact with a host or its urine, or indirectly via contaminated soil or water. After penetration through mucous membranes, abraded or scratched skin, leptospires multiply upon entering the blood stream. They invade the kidneys, liver, spleen, central nervous system, eyes, and genital tract. The immune response can clear the leptospires from most organs except from the kidneys, where the agent can persist, and is shed in the urine

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Leptospira species are widespread in many animals, including rodents and cats in the UK	Medium

Consequences of introduction or exposure	Mitigation possible
The disease is of little consequence to wildcats in most cases, but asymptomatic carrier wildcats pose a zoonotic risk to human workers if infected	Yes

Mitigations measures	Mitigations advised
Workers working with captive wildcats and cleaning enclosures should always wear gloves. Good cleaning and disinfection practices will limit risks of environmental contamination acting as a source of infection in captive facilities	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Lyme disease	*Borrelia burgdorferi* and other *Borrelia* spp.	Medium	Low

Hazard Description

Lyme disease, which is caused by the bacteria *Borrelia burgdorferi* and transmitted through the bite of ticks such as *Ixodes ricinus* and affects wild and domestic animals and humans. There are only few reports on Lyme borreliosis (LB) in cats. In a survey of 271 domestic cat in Europe, only 2% demonstrated antibodies (Pantchev et al, 2016). This was a much lower prevalence than in dogs. Many cats do not appear to show noticeable signs when infected. When infected, cats may show lameness, sometimes a shifting leg lameness, fever, loss of appetite, fatigue, or difficulty breathing. Lyme disease can also affect the kidneys, joints, nervous system, and heart. Ticks on cat could act as a source of disease for humans in contact

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type

Yes	No	Yes	Source, Carrier, Zoonotic

Transmission pathways of concern:	
Transmission is via the bite of ticks such as *Ixodes ricinus*	
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Lyme disease is present in the UK	Low

Consequences of introduction or exposure	**Mitigation possible**
Ticks on cats could potentially act as q source of infection with Lyme disease for humans	Yes
Mitigations measures	**Mitigations advised**
Wildcats need treatment for both fleas and ticks before entering a captive facility, but also a regular prophylactic program such as recommended by manufacturer for domestic cats	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Mycobacterial infection	*Mycobacterium tuberculosis* complex, including *M. bovis*, *M. microti*, and *M. avium* complex (MAC), and Feline leprosy caused by *M. lepraemurium*	Medium	Low

Hazard Description

Mycobacteria are intracellular, acid-fast bacilliform Gram-positive bacteria. Mycobacterial species are zoonotic. Cats can become infected by a range of mycobacterial species. This includes members of the *Mycobacterium tuberculosis* complex, notably *Mycobacterium bovis* and *M. microti* but cats seem to be inherently resistant to *M. tuberculosis* infection. Cats may also be infected by members of the non-tuberculous mycobacteria such as those of the *M. avium* complex and other slow-growing, rapid-growing or fastidious-growing species including *M. lepraemurium*, causing feline leprosy. Geographical variation exists with respect to which mycobacterial species are most seen in domestic cats. Clinical signs are often cutaneous in nature. These may include skin nodules with or without ulceration, draining wounds, regional or generalised lymphadenopathy. Less frequently cats may manifest respiratory signs such as coughing, tachypnoea, dyspnoea. Occasionally bone or joint are affected, with swelling, lameness, or pain seen. Neurological or ocular disease such as uveitis signs may also occasionally occur, and there may also be the development of granulomatous lesions in organs. In a survey of 339 cases of feline mycobacterial disease in domestic cats in the UK (Gunn-Moore *et al*., 2011) *M. microti* was cultured from 19%, *M. bovis* 15%, *M. avium* 7%, non-*M. avium* non-tuberculous mycobacteria 6%, with no growth in 53% of samples. Affected cats commonly presented with single or multiple cutaneous lesions (74%), which were sometimes ulcerated or discharging, located most frequently on the head (54%). Lymph nodes were usually involved (47%),

typically the submandibular nodes. Systemic or pulmonary signs were rarely seen (10-16%). In a specific outbreak 130 domestic cats in the UK were found to be infected with *M. bovis*, of which 47 cats were demonstrating clinical signs. The outbreak was believed due to being fed a raw food diet comprising venison, as this did not undergo meat inspection (O'Halloran *et al*., 2021). Five people were found likely to have latent infections associated with the outbreak, one of whom required treatment

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:

Mycobacteria can be transmitted by inoculation via the skin, such as by hunting of infected host species such as voles. Transmission may also be by inhalation, by ingestion of prey or contaminated raw food, and by direct contact of open wounds or with contaminated environments or discharges

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
Mycobacteriosis is a zoonosis. Difficulties with diagnosis as well as prolonged treatment required are not viable nor recommended in captive wildcat programs for breeding or release and individual infected would need euthanasia. A case would likely preclude release of a group of cats until extensive testing and monitoring is undertaken, so could threaten the viability of a captive breeding and release program	Yes
Mitigations measures	**Mitigations advised**
Captive wildcats or those undergoing soft release should not be fed raw venison, unless this has undergone meat inspection by a veterinarian. This is not part of a natural wildcat diet and is best avoided. Mycobacterial disease diagnosis can be challenging. Definitive diagnosis is reliant on mycobacterial culture, but this is limited as not all mycobacterial species can be cultured, and organisms are extremely slow growing, delaying mitigation of suspected cases. Further supportive diagnostic testing includes the demonstration of the presence of pyogranulomatous inflammation on cytology or typical histopathological changes with acid-fast bacilli (AFB) organisms, positive polymerase chain reaction (PCR) assays on lesion samples and positive blood interferon-gamma release assay (IGRA) results. Treatment while possible, requires several months, using multiple antibiotics such as rifampicin, a macrolide and a fluoroquinolone. This, combined with the zoonotic risk and risk to other cats makes euthanasia the preferred outcome for any wildcats that could be found to have Mycobacterial disease. Cats infected with *M. bovis* do pose a zoonotic risk, although most human cases are usually due to *M. tuberculosis* infection, not *M. bovis* infection. Although the risk	Yes

is very low, those working with captive wildcats and cleaning enclosures should always wear gloves. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species. Mycobacteriosis needs consideration as a possible aetiology in any wildcat with skin lesions, non-healing wounds, lymphadenopathy, respiratory abnormalities such coughing or dyspnoea, thoracic imaging changes. All affected wildcats in a captive breeding or release facility, showing these types of signs need diagnostic investigation under anaesthesia including assessment for Mycobacteriosis	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Pasteurellosis	*Pasteurella multocida*	Medium	Low

Hazard Description

Pasteurellae bacteria, including *Pasteurella multocida*, are part of the normal oral and respiratory tract flora of cats. Aside from being a commensal, they can also be an opportunistic pathogen and are commonly isolated from feline subcutaneous abscesses, pyothorax, respiratory tract diseases or other conditions, usually as a secondary agent. Bites, scratches or even only close contact with cats can transmit *Pasteurella* to humans. Severe infections, septicaemia and peritonitis can occur in immunocompromised, and less frequently in immunocompetent, persons in contact with cats.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Zoonotic

Transmission pathways of concern:

Pasteurella multocida is part of the normal oral and respiratory tract bacterial flora of cats, and bites, scratches or even just close contact can transmit *Pasteurella* to humans

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
This bacterium is found in most cats in the UK	High

Consequences of introduction or exposure	**Mitigation possible**
As a normal organism in cats, there is a small risk of infections and abscesses when released wildcats fight, but the main risk is to people working with cats who are scratched or bitten being infected. Immunocompromised people have a higher risk of more severe infection	Yes
Mitigations measures	**Mitigations advised**
Adequate PPE such as protective gauntlets or other means should be used when handling cats to prevent injuries such as bites or scratches that may become infected. Examination (disposable) gloves should be worn when cleaning out wildcat enclosures, or when having contact with cats, even when anaesthetised. *Pasteurella multocida* poses a zoonotic risk to immunocompromised humans.	Yes

Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Plague	*Yersinia pestis*	Low	Low

Hazard Description

Plague is a severe bacterial disease of humans and other mammals caused by *Yersinia pestis*. It is endemic in some areas of Asia, Africa and the Americas, but is not currently present in the UK or Western Europe. It is a notifiable disease in the UK. Rodents are reservoirs and infection is spread between rodents by fleas. Epidemics in rodents expose humans and domestic animals to plague. Apart from flea bites, infection of cats can occur from to ingestion of infected rodents causing a necrotic stomatitis and regional lymphadenitis (bubonic plague form). Septicaemic and pneumonic forms can occur, and they are frequently fatal. Mild forms of disease or asymptomatic infections are also seen. Most human infections are acquired via flea bites

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No- notifiable disease	No	Yes	Zoonosis

Transmission pathways of concern:

Rodents are the main reservoir of infection and people are most commonly infected through rodent flea bites. People are less commonly infected by scratches or bites from infected domestic cats, by direct handling of infected animal tissues

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Plague is currently not present in Western Europe and has a negligible risk of introduction via imported wildcats Europe.	Low

Consequences of introduction or exposure	**Mitigation possible**
While risk of introduction or exposure are currently negligible, occurrence in the UK would be a very serious human health concern	Yes
Mitigations measures	**Mitigations advised**
Plague is not present in Western Europe and has minimal current risk of introduction via imported wildcats. In a risk situation flea control should be implemented, and any suspected cases must be kept in isolation, and protective gloves, clothes, goggles and face masks must be used by staff. It is a notifiable disease in the UK	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Protothecosis	*Prototheca wickerhamii* and *P. zopfii*	Low	Low

Hazard Description

Protothecosis, also known as Algaemia, is a rare disease found in cats, humans and other animals caused by a type of green alga known as Prototheca that lacks chlorophyll and enters the human or animal bloodstream. The two most common species are *Prototheca wickerhamii* and *P. zopfii*. *Prototheca* are found in sewage and soil. Infection is rare despite high exposure and is related to a defective immune system. *Prototheca* infections are very rare in cats, and have been associated with cutaneous or subcutaneous infections, on rarely neurological or ophthalmic signs. It does not appear transmissible to humans from affected cats

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes	Carrier

Transmission pathways of concern:

Prototheca are found in soil and sewage, and appear to rarely cause infections if entering wounds in immunocompromised individuals

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Prototecha are widespread in soil	Low

Consequences of introduction or exposure	Mitigation possible
The disease poses minimal risk for wildcats, but could affect an individual wildcat if immunocompromised such as when infected with FIV or FeLV	No
Mitigations measures	**Mitigations advised**
Infection is very rare in cats, and only those with compromised immunity. Disease screening of wildcats for immunosuppressive disease will help mitigate any meaningful risk	No

Infectious Disease	Agent	Risk rating	Risk after mitigation
Q fever	*Coxiella burnetii*	Medium	Low

Hazard Description

Q fever or ”query fever” is a zoonotic disease caused by *Coxiella burnetii*. The most common reservoirs are cattle, sheep and goats, but many species of mammals, birds and ticks can be infected with *C. burnetii.* Cats become infected by tick bites or contact with farm animals, by ingestion or inhalation of the bacteria. The disease in cats is usually subclinical, but abortions may occur. *Coxiella*

burnetii has been isolated from the placenta of aborting cats, but also from cats that have had normal parturition. After experimental infection, cats develop fever, anorexia and lethargy. Domestic cats have been implicated as a source of infection for humans, in particular through contact with bacteria excreted during abortion or parturition. Humans are vulnerable to infection, which can result from even low numbers of bacteria. The most common manifestation in humans is flu-like symptoms, with fever, malaise, severe headaches, muscle and joint pain, and respiratory and gastrointestinal symptoms, although half of infected individuals exhibit no clinical symptoms. The disease can also progress in some people to a life-threatening acute respiratory distress syndrome, in the first five days of infection. A seropositive prevalence of 33% was found in wild living European wildcats was found in a national park in Spain in proximity to people and domestic animals (Candela *et al*., 2017), while a 61% prevalence in 26 tested domestic cats in the UK was reported (Meredith *et al*., 2015)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Zoonotic

Transmission pathways of concern:

Transmission is by ingestion or inhalation of the bacteria, or rarely via bite from an infected tick. As the bacteria has a tropism for the uterus and mammary glands, the placenta and foetal membranes may be heavily contaminated. *C. burnetii* can also be found in the urine, faeces and milk of infected animals. Contaminated aerosols from foetal membranes, urine, faeces, or milk of infected animals are considered the main reservoir of infection for humans. During parturition, high numbers of bacteria are excreted contaminating the environment

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The bacterium already has a high prevalence in cats and other mammals in the UK	High

Consequences of introduction or exposure	**Mitigation possible**
The disease is of minimal consequence to wildcats but poses a serious zoonotic risk to human workers if infected. While most affected people will develop flu-like signs, in some infection my progress to a life-threatening pneumonia	Yes
Mitigations measures	**Mitigations advised**
Cats have been implicated as a source of infection for humans, especially through contact with bacteria excreted during the birth process or abortions. Workers working with captive wildcats should always wear gloves, and if cleaning after a birth or still birth, or handling newly born kittens should also wear a mask to minimise risk of infection. Routine tick prevention treatment of cats is also recommended in captive wildcats. Any wildcat abortions or still births should be sent for full post-mortem examination	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**

Salmonellosis	*Salmonella* spp.	High	Low

Hazard Description

Salmonella is a genus of rod-shaped bacillus Gram-negative bacteria of the family Enterobacteriaceae. *Salmonella* species are intracellular pathogens, with most infections due to the ingestion of food contaminated by faeces. Many cats may be infected without symptoms or disease but shed the bacteria in their faeces. The ability to harbour *Salmonella* as normal non-pathogenic bacteria of the gastrointestinal tract may be a physiological adaptation to carnivory. The high rate of faecal shedding of *Salmonella* in healthy individuals clouds the interpretation of a positive faecal culture in an ill cat, or one with diarrhoea. Salmonellosis has been described in cats, with clinical cases are most often seen in kittens, geriatric or immunocompromised animals, or an individual cat exposed to a large infective dose in contaminated food, or exposure to a clinically ill animal. While typhoidal *Salmonella* serotypes can only be transferred between humans and cause foodborne illness as well as typhoid and paratyphoid fever, nontyphoidal *Salmonella* serotypes are zoonotic and can be transferred from animals and between humans. They usually invade only the gastrointestinal tract and cause salmonellosis, the symptoms of which can be resolved without antibiotics. In immunocompromised humans the disease can however be more serious and even fatal. Asymptomatic cats shedding the bacteria pose a risk to human workers, but there is also a risk from handling and preparing food items such as raw chicken and rodents being fed to captive wildcats

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source, Captivity, Carrier, Zoonotic

Transmission pathways of concern:

Salmonella infection transmission is faeco-oral, entering through the digestive tract and must be ingested in large numbers to cause disease in healthy adult humans. Immunocompromised individuals are at greater risk of more severe illness

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Salmonella is widespread in asymptomatic domestic and wild animals in the UK	High

Consequences of introduction or exposure	**Mitigation possible**
The disease poses a low risk to wildcats, but cleaning and handling wildcats, as well as handling raw food items such as chicken and rodents for the wildcats all pose a risk of human infection. This is normally self-limiting enteritis but can be more serious in immunocompromised people	Yes

Mitigations measures	**Mitigations advised**
All animal workers having contact with cat faeces or raw diets have a high rate of occupational exposure to *Salmonella* and should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection. Immunocompromised	Yes

individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Streptococcus	*Streptococcus canis*, *S. equi zooepidemicus* and other spp.	Low	Low

Hazard Description

Streptococcus canis is part of the normal commensal mucosal flora in cats, but can sometimes opportunistically cause disease including neonatal septicaemia, cervical lymphadenitis, abscesses, pneumonia, discospondylitis, osteomyelitis, polyarthritis, urogenital infections, necrotizing fasciitis/myositis, streptococcal toxic shock syndrome, sinusitis, meningitis, and endocarditis. Rare zoonotic cases have been reported, mainly in elderly and immunocompromised individuals, and more usually from exposure to domestic dogs rather than cats. *Streptococcus equi zooepidemicus* is regarded as a normal commensal in horses but can infect a wide variety of species including cats and man. Zoonotic cases are rare and mainly in immunocompromised. Clinical signs in cats of feline pneumonia and sinusitis included purulent nasal discharge, cough, dyspnoea, otitis media-interna, meningoencephalitis and death. In cats the infection can sometimes induce severe haemorrhagic pneumonia occasionally resulting in fatalities, and housed groups of cats such as a breeding centre are at greater risk

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity, Carrier, Zoonotic

Transmission pathways of concern:

Streptococcus species are normal flora in the oral cavities of cats, but will opportunistically infect wounds and the respiratory system

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The bacterium is widespread in asymptomatic animals in the UK	High

Consequences of introduction or exposure	**Mitigation possible**
Zoonotic cases are rare and mainly in immunocompromised. The bacteria can opportunistically cause disease in housed cats under stressed conditions	Yes
Mitigations measures	**Mitigations advised**
There are no vaccines against streptococcal infections for cats. Proper captive facility hygiene, biosecurity and management, including stress reduction and regular core vaccinations can reduce the risk of secondary streptococcal complications. Immunocompromised individuals should ideally not work in	Yes

contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Tetanus	*Clostridium tetani*	Medium	Low

Hazard Description

Tetanus toxemia is caused by a specific neurotoxin produced by *Clostridium tetani* in necrotic tissue. Almost all mammals are susceptible, although cats are relatively more resistant than many other species. *C. tetani* is an anaerobic bacteria found in soil and the intestinal tracts. In most cases, it is introduced into the tissues through deep puncture wounds, that provide a suitable anaerobic environment. The toxin causes spasmodic, tonic contractions of the voluntary muscles and muscular spasms. Spasms may be severe enough to cause bone fractures or luxations, and severe cases can result in death. Cases occasionally occur in cats, but importantly cases have been caused in humans due to cat bites or scratches. Tetanus cases have been reported in humans despite immunization, with one case reported due to cat scratches and bites (Fica *et al*., 2017)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity, Zoonotic

Transmission pathways of concern:

The bacteria is introduced into the tissues through deep puncture wounds that provide a suitable anaerobic environment

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The bacterium is ubiquitous in soil in the UK	Low

Consequences of introduction or exposure	**Mitigation possible**
There is a risk of an individual cat becoming affected and requiring treatment, but the main risk is to workers who may develop tetanus after a cat scratch or bite. On rare occasions people have developed tetanus even if they have been immunised	Yes
Mitigations measures	**Mitigations advised**
Adequate PPE such as protective gauntlets or other means should be used when handling cats to prevent injuries such as scratches that may become infected. It is advisable that workers with wildcats are immunised against Tetanus	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**

Tick-bite fever	*Anaplasma phagocytophilum*, but also other *Anaplasma* spp., *Ehrlichia* spp. and *Rickettsia* spp.	Medium	Low

Hazard Description

Anaplasma spp., *Ehrlichia* spp. and *Rickettsia* spp. are vector-borne pathogens infecting many mammalian species but causing disease in very few of them. *Anaplasma phagocytophilum* is the most important feline pathogen among them. These infections are not present in the UK but are in numerous European countries and infection has been reported in wildcats. Infection can be asymptomatic, or may manifest as non-specific clinical signs including fever, anorexia, lethargy, and occasionally joint pain may occur

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	Yes	Yes	Source, Zoonotic

Transmission pathways of concern:

These infections are spread between mammals by the bites of ticks and fleas

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Medium from imported wildcats	Low

Consequences of introduction or exposure	**Mitigation possible**
Infection is not currently present in the UK, and poses a zoonotic risk if introduced as well as a risk to domestic and wild mammals	Yes
Mitigations measures	**Mitigations advised**
Any wildcats due to be imported from Europe must be treated with appropriate ectoparasiticides, and any non-specific illness investigated diagnostically. In areas with infection wildcats should also be tested. Blood or buffy-coat smear evaluation may be useful for cytological diagnosis of infections with *Ehrlichia* and *Anaplasma* spp. Blood PCR analysis is a sensitive and specific method for confirming diagnosis at the onset of acute clinical signs, provided samples are obtained before starting therapy. Cats with clinical signs are usually antibody negative due to inadequate time for seroconversion. Antibodies to rickettsial infections can be detected by immunofluorescence (IF) test and ELISA, but cross-reactions exist between organisms of the same genus	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Tularaemia	*Francicella tularensis*	High	Low

Hazard Description			
Francisella tularensis (formerly *Pasteurella tularensis*) is a small, facultative intracellular Gram-negative, non-motile, aerobic, zoonotic bacterium, causing Tularaemia. This is a potentially fatal disease of cats and humans. The host range is very wide, including mammals, birds, reptiles, amphibians, and fish, and modes of transmission include inoculation by bite, skin/mucosal contact, inhalation, ingestion, and vector transmission by ticks, flies, and mosquitoes. The bacteria can survive for weeks at low temperatures in animal carcasses, soil, and water. Tularaemia is present in many European countries but is not present in the UK and is a notifiable disease in many European countries, although not the UK. Wild living cats are at higher risk of infection because of exposure to ticks, rodents and lagomorphs. Most cats and humans develop either a localized infection of the skin with severe inflammation and draining lymph nodes (the ulceroglandular form) or a systemic infection (typhoidal tularaemia) with high fever and sepsis. Oropharyngeal lesions are associated with oral transmission. A pneumonic syndrome is rare encountered in cats. Kittens usually suffer from more severe forms of the disease			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	No	Yes	Source, Zoonotic
Transmission pathways of concern:			
Modes of transmission include inoculation by bite, skin or mucosal contact, inhalation, ingestion, as well as transmission by vector such as ticks, flies, and mosquitoes. Human infections most commonly occur via skin contact, yielding an ulceroglandular form of the disease. Inhalation of bacteria leads to the potentially lethal pneumonic form of tularaemia. Less frequently oropharyngeal infection can occur due to consumption of contaminated food or water, and conjunctival infection due to inoculation at the eye by rubbing contaminated hands			
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**		
Medium from imported wildcats	Low		
Consequences of introduction or exposure			**Mitigation possible**
Tularaemia is not present in the UK. It poses a serious risk to human health and that of domestic and wild animals should it be introduced to the UK and become established			Yes
Mitigations measures			**Mitigations advised**
Disease screening of wildcats before importation is essential if from a European country where infection occurs. External parasitical treatment to prevent tick infestations is recommended for wildcats in Europe before importation and is essential if import is from a country with the disease present. Any suspected cases must be kept in isolation, and protective gloves, clothes, goggles and face masks must be used by staff. It is a notifiable disease in the UK			Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Tyzzer's disease	Clostridium piliforme	Low	Low

Hazard Description

Clostridium piliforme is an anaerobic, motile, gram-negative bacterium, causing Tyzzer's disease. This is an acute epizootic bacterial disease characterized by necrotic lesions on the liver and is usually fatal. Animals with the disease become infected through oral ingestion of the bacterial spores and usually die within a matter of days. Young, stressed, malnourished, or immunocompromised animals are more commonly affected. Clinical signs of Tyzzer's Disease include diarrhoea, depression, emaciation, and a poor coat. Due to the acute nature of this disease, infected individuals often do not live long enough to exhibit symptoms. Cases are rare in cats and mainly been seen in stressed kittens or cats with other immunosuppressive diseases such as feline panleukopaenia and herpes virus infection

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes	Captivity, Zoonotic

Transmission pathways of concern:

Transmission is faecal-oral. Bacterial spores within infected faecal matter can contaminate soil or feed. Spores can survive at room temperature for over one year. Animals do occasionally transfer the disease asymptomatically, acting as carriers. Infected animals are more likely to develop the disease when subjected to stressful conditions

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Clostridium piliforme is found in rodents in the UK	Low

Consequences of introduction or exposure	Mitigation possible
The disease is rare in cats, and unlikely to cause mortalities in wildcats unless captive wildcats are severely stressed, malnourished or immunocompromised due to other serious infections	Yes

Mitigations measures	Mitigations advised
Because animals likely ingest bacterial spores from contaminated bedding and feed, regular cleaning is the main method of prevention. Faeces should be removed regularly, and ideally daily from enclosures. All animal workers having contact with cat faeces or raw diets should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Yersiniosis	*Yersinia enterocolitica* and *Y. pseudotuberculosis*	Medium	Low

Hazard Description

Yersinia are gram negative bacteria, commonly found in rodents, but also infected other mammals including cats and humans. Yersiniosis symptoms may include watery or bloody diarrhoea and fever but can also disseminate further to mesenteric lymph nodes causing lymphadenopathy. *Y. pseudotuberculosis* can cause localized tissue necrosis and granulomas in the spleen, liver, and lymph nodes. *Yersinia* spp. are zoonotic. Pathogenic strains of *Yersinia* were isolated from a wildcat in Bulgaria (Nikolova *et al*., 2001). Wildcats could act as a wild reservoir for pathogenic *Y. enterocolitica* and *Y. pseudotuberculosis*

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes	Source, Captivity, Carrier, Zoonotic

Transmission pathways of concern:

Transmission faecal-oral. Rodents are the natural reservoirs of *Yersinia*, but other mammals including cats can also serve as hosts. Infection may occur via consumption of food contaminate contaminated with faeces or urine, or via humans with poor hand hygiene

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Yersinia are common in wild rodents in the UK	Medium

Consequences of introduction or exposure	Mitigation possible
The bacteria can cause illness in captive or free-living wildcats. In most cases it is self-limiting and does not require treatment in cats. Cats can act as a source of zoonotic infection and gastrointestinal disease for humans working with them	Yes

Mitigations measures	Mitigations advised
Disease screening of wildcats entering captivity for breeding or release should include bacterial culture from faeces for *Yersinia* species. All animal workers having contact with cat faeces or raw diets should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	Yes

Fungal diseases

Infectious Disease	Agent	Risk rating	Risk after mitigation
Adiaspiromycosis	*Emmonsia crescens*	Low	Low

Hazard Description

Emmonsia parva (formerly *Chrysosporium parvum*) is a filamentous, saprotrophic fungus causing the lung disease, adiaspiromycosis, most commonly found in small mammals and burrowing rodents, but occasionally other species. The fungus is saprophytic and also found in soil, releasing spores into the air. A prevalence of 29% in 94 native British mammals was found (Borman *et al*., 2009) in species including red squirrel, rabbits, pine martin and otters. Infection has been described in humans, and immunocompromised people are more at risk, as are those in areas with high levels doing manual labour with soil and dust. The infection has not been described in wildcats

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	No	Captivity, Carrier

Transmission pathways of concern:

Infection occurs via inhalation of airborne spores into the respiratory tract

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Low	Low

Consequences of introduction or exposure	Mitigation possible
Infection has not been described in wildcats. Infection would only affect an individual wildcat's health and welfare and have no impact on the population, facilities or human workers	No

Mitigations measures	Mitigations advised
There are no meaningful mitigations for captive and free ranging wildcats	No

Infectious Disease	Agent	Risk rating	Risk after mitigation
Aspergillosis	*Aspergillus fumigatus*, *A. felis*	Low	Low

Hazard Description

Aspergillus species of fungi are found worldwide in soil and decaying vegetation. A sporadic mycosis, all mammals, including humans, are susceptible to aspergillosis. The most common site of clinical signs is the respiratory tract, reflecting the primary inhalational route of infection. Respiratory involvement is usually confined to the upper respiratory tract, as chronic fungal rhinosinusitis.

However, invasive pulmonary aspergillosis, disseminated invasive aspergillosis, and focal infections of the ear, cornea, gastrointestinal tract, or urinary bladder have also been described in individual cats. Immunosuppressed cats are likely more prone to developing the disease. Direct transmission does not occur hence Aspergillosis is not a zoonosis

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity, Carrier

Transmission pathways of concern:
Cats and other animals are infected through inhalation of environmental fungal spores. Aspergillosis is not a zoonosis as direct transmission does not occur

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
As a sporadic infection, infection would only affect and individual wildcat's health and welfare and have no impact on the population, facilities or human workers	No

Mitigations measures	**Mitigations advised**
Due to the sporadic occurrence of infection in individual cats and the ubiquitous occurrence of *Aspergillus* species, prophylaxis is not possible. There may be a link between Aspergillosis and immunosuppression. Theoretically reducing exposure, such as restricting access to mouldy environments, such as compost heaps or mouldy walls could help reduce the risk to immunocompromised cats, but most of the common infectious causes of immunocompromise such as FIV and FeLV should have been detected by disease screening before cats enter captive facilities. There are no public health issues concerning infected cats due to the ubiquitous occurrence of *Aspergillus* species and that cats do not act as a source for zoonotic infections	No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Cryptococcosis	*Cryptococcus neoformans-C. gattiispecies* complex	Low	Low

Hazard Description
Cryptococcosis is a non-contagious, rare or sporadic disease, which occurs worldwide in cats. It is caused by the *Cryptococcus neoformans-Cryptococcus gattii* species complex. Cats acquire the infection from a contaminated environment. Avian guano, particularly pigeon droppings, offer favourable conditions for the reproduction of neoformans, but both *C. neoformans* and *C. gattii* species are also associated with decaying vegetation such as Eucalyptus leaves. Basidiospores are the infectious propagules of *Cryptococcus* and usually they penetrate the respiratory system and induce the primary infection there. Asymptomatic superficial colonization of the respiratory tract is

more common than clinical disease that develops when tissue invasion occurs. Cryptococcosis can present in several different clinical forms, including nasal, central nervous system, cutaneous, and systemic forms. Cryptococcosis is not a zoonotic disease and cats with the disease are not contagious to humans and other animals. The presence of avian guano, particularly pigeon droppings and some decaying vegetation substrates, such as *Eucalyptus* leaves, may be considered a risk factor, but efficient preventative measures have not been demonstrated

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity, Carrier

Transmission pathways of concern:

Inhalation of Basidiospores which can establish the diseases in the respiratory tract

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Cryptococcus is widespread in the environment in the UK, only rarely and sporadically causing disease	Low

Consequences of introduction or exposure	**Mitigation possible**
As a sporadic infection, infection would only affect and individual wildcat's health and welfare and have no impact on the population, facilities or human workers	Yes
Mitigations measures	**Mitigations advised**
While the presence of bird dropping, particularly those of pigeon and decaying vegetation substrates may be considered a risk factor, efficient preventative measures have not been demonstrated. It is however prudent to limit risks by avoiding the accumulation of pigeon droppings or compost pile sin close proximity to captive wildcats. Pigeons should ideally be discouraged from perching on the roof of open or mesh enclosures into which they can defecate. Cryptococcosis is not a zoonotic disease and cats with the disease are not contagious to humans and other animals	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Encephalitozoonosis	*Encephalitozoon cuniculi*	Low	Low

Hazard Description

Encephalitozoon cuniculi is a common obligate intracellular microsporidian parasite of rabbits (*Oryctolagus cuniculus*), which is recognised as a pathogen of cats and other mammals. These unicellular microsporidia were previously considered protozoa; however, it is now recognised that microsporidia are related to the fungal Kingdom. *E. cuniculi* can manifest in feline uveitis and cataract formation. It is not significantly associated with kidney disease or meningoencephalitis in cats. *E. cuniculi* is a potentially zoonotic infection, posing a risk to immunocompromised humans, from

infected rabbits. Spore shedding has been infrequently identified in cats, so infected cats may also pose a zoonotic risk			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity, Carrier, Zoonotic
Transmission pathways of concern:			
The infective form is a resistant spore which can survive for a long time in the environment. Mice appear to be the major reservoir of infection for cats and cats may be most likely to become infected by ingestion of mice rather than rabbits. Like humans, cats may also be infected by consuming water or food contaminated with infective spores			
Likelihood of disease introduction or release		**Likelihood of exposure to the introduced wildcats**	
The organism is widespread in rabbits and rodents in the UK		Medium	
Consequences of introduction or exposure			**Mitigation possible**
Despite a high prevalence in rodents and rabbits, only sporadic cats are clinically affected, developing eye lesions, so the disease would likely only affect an individual wildcat's health and welfare. The infection can potentially be shed in cat urine and pose a zoonotic risk to humans, mainly if they are immunocompromised			Yes
Mitigations measures			**Mitigations advised**
Workers working with captive wildcats and cleaning enclosures should always wear gloves. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species. Raw rabbit meat has a high prevalence of *E. cunculi,* and could be avoided in the diet, but ingestion of infected rodents appears more important, and so rodent control of captive facilities may be more meaningful in preventing infection			Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Ringworm	*Microsporum canis* and other dermatophyte spp.	Medium	Low
Hazard Description			
Dermatophytosis, or "ringworm" is caused by almost 40 species belonging to the genera *Microsporum*, *Trichophyton* and *Epidermophyton*. Over 90% of domestic cat dermatophytosis cases are caused by *Microsporum canis* (Moriello, 2014). Others are caused by *M. gypseum*, *Trichophyton, mentagrophytes*, *T. quinckeanum*, *T. verrucosum* or other agents. *M. canis* and other dermatophytes produces arthrospores that may remain infective for about a year and are easily transmitted by			

direct contact or by fomites to cats, other animal species and humans. Many cats are infected subclinically or are fomite carriers of the arthrospores. Dermatophytosis may be endemic in groups of cats, especially in a poor environment, and its eradication is difficult in such cases. Circular alopecia, desquamation and sometimes an erythematous margin around central healing ("ringworm") are typical lesions of this chronic skin disease. In many cats the disease is self-limiting, with only hair loss and scaling. In young animals and immunosuppressed adults, the outcome may be a multifocal or generalised skin disease. For eradication if the disease occurs in a group of cats in a captive facility intensive decontamination of the environment is crucial. While an outbreak in European wildcats has not been described, there is a report of an outbreak in a group of captive tigers and people working with them (Sykes *et al*., 2005). In cats that are not immunocompromised isolated lesions usually resolve spontaneously after 1-3 months and may not require medication. However, medical treatment of such cases will reduce the disease course as well as the risk for other animals, humans and contamination of the environment

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity, Carrier, Zoonotic

Transmission pathways of concern:

M. canis produces arthrospores that may remain infective for about a year and are easily transmitted by direct contact or by fomites to cats, other animal species and humans

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Already widespread in many animal species including domestic cats in the UK	Low

Consequences of introduction or exposure	**Mitigation possible**
Ringworm mainly poses a zoonotic risk to people working with wildcats, but could also affect kittens or immunosuppressed individuals, and infection could result in contamination of enclosures with recurrent infections over time	Yes

Mitigations measures	**Mitigations advised**
Workers working with captive wildcats and cleaning enclosures should always wear gloves. Wash and dry any bedding and cloth used with captive wildcats using a hot water cycle. Washing machines and dryers if used in a captive wildcat facility should have separate units for animal bedding and equipment from those used for human clothing. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species. All wildcats entering a captive breeding or release facility, or any cats showing abnormal skin conditions must undergo a full veterinary examination under anaesthesia, and any skin lesions investigated dermatologically with appropriate tests such as skin scrapes, cellotape preparation, and dermatophyte testing. Possible underlying diseases that could cause immunosuppression such as FV and FeLV also need investigation if a wildcat is affected. Common disinfectants or 1:100 concentration household bleach is usually effective for decontamination of the environment	Yes

Protozoans

Infectious Disease	Agent	Risk rating	Risk after mitigation
Babesiosis	*Babesia pisicii* and *B. canis*	Low	Low

Hazard Description

Babesiosis is a tick-borne protozoal disease that infect blood cells. *Babesia canis*, *B. vogeli, B. gibsoni*, *B. microti* can cause disease in dogs and are sometimes found in cats but rarely cause disease in cats. Babesia canis is more prevalent in Europe, but is present in ticks in the UK, so is now endemic (Sands *et al*., 2022). *B. pisicii* and *B. canis* have been reported in wildcats in Romania, with a prevalence of 40% in 51 wildcats tested. There was no evidence of infection causing disease in the wildcats

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, carrier

Transmission pathways of concern:

Transmission between animals is via tick-bites

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Low	Low

Consequences of introduction or exposure	Mitigation possible
Babesia canis, the main species seen in cats, is already present in ticks in England. Most infected cats show no obvious symptoms, and at worst an anaemia, that could impact the health and welfare of an individual cat. Infected cats can act as a carrier for infection transmission to ticks and on to other animals, increasing disease prevalence locally.	Yes

Mitigations measures	Mitigations advised
Disease screening of all cats entering the program includes haematology, which may detect signs such as haemolytic anaemia, which is usually regenerative, macrocytic, and hypochromic. Disease screening haematology also includes examination of blood smears, which would help detect asymptomatic carriers, and infection can be confirmed by PCR. All cats need tick and flea treatment both before import from Europe, and at regular treatment schedules once in a captive facility for breeding or release in the UK	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation

Coccidia	*Cystoisospora* (Isospora) *felis* and *C. rivolta*	Low	Low

Hazard Description

Cystoisospora species, previously known as *Isospora*, are microscopic, coccidian parasites that causes an intestinal tract infection. Most cats are infected at a young age, and clinical disease is uncommon and usually mild. When clinical signs occur, they occur in kittens and very occasionally in debilitated or immunocompromised adults, or those with other serious infections. In kittens, illness occurs primarily during weaning stress. High faecal shedding of oocysts is associated with clinical signs of disease, especially in kittens. The main sign of illness is diarrhoea, this can be bloody, and in some cases, kittens may also be anorexic, become dehydrated, show abdominal pain and lose weight. Very rarely anaemia, and respiratory or neurological signs may occur. Most domestic cats eventually become infected with *C. felis*. In most kittens and cats infection is spontaneously eliminated, making treatment unnecessary. After oocyst exposure, immunity is good. A prevalence of 4% *C. felis* oocysts was found in 121 free-living wildcat's faecal samples from Italy (Napoli *et al.*, 2016)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Carrier

Transmission pathways of concern:

Transmission is faecal-oral in nature. Infective oocysts can survive for many months in the environment and are resistant to many disinfectants

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	High

Consequences of introduction or exposure	**Mitigation possible**
Clinical disease is rare, and infection is spontaneously eliminated in almost all cases. Kittens may develop disease, and this will be more severe if immunocompromised. Environmental contamination in a captive facility can occur due to resistance of oocysts.	Yes

Mitigations measures	**Mitigations advised**
Faecal parasitology must be performed on all cats entering captive facilities, more to limit environmental contamination for kittens than to prevent diseases in adult cats. In almost all kittens infection is spontaneously eliminated, making treatment unnecessary. All queening and whelping areas and rearing pens must be kept clean. Faeces should be removed daily to limit sporulation making oocysts infective and limiting environmental contamination in a captive facility. Infective oocysts can survive for many months in the environment and are resistant to many commonly used disinfectants. Chlorine disinfectants are usually effective	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Cryptosporidium	*Cryptosporidium felis*	Low	Low

Hazard Description

Cryptosporidium is an apicomplexan genus of alveolates which are parasites of the gastrointestinal Tract. *C. felis* rarely causes clinical disease in cats, unless they are immunocompromised or in some young kittens. Cryptosporidiosis consists of watery diarrhoea. There is no effective specific treatment, and cases resolve on their own with just supportive care. Oocysts are sporulated and are infective when excreted in the faeces and are resistant to most disinfectants. Oocysts can survive for months in cool moist conditions. In humans, the risk of contracting cryptosporidiosis caused by *C. felis* is considered to be relatively low, and most of the confirmed cases have been observed in immunocompromised patients. There is a single report of *Cryptosporidium* in a carcase of an emaciated juvenile male genetic wildcat in Scotland (Bacon *et al*., 2023)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Carrier, Zoonotic

Transmission pathways of concern:

Transmission is faecal-oral in nature. Oocysts are fully sporulated and infective when excreted in the faeces. Oocysts are resistant to most disinfectants and can survive for several months in cool and moist conditions

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Low	Medium

Consequences of introduction or exposure	Mitigation possible
Clinical disease is rare, and infection resolves on its own in almost all cases. Kittens or immunocompromised cats may develop diarrhoea, and this can contaminate a captive facility due to the resistance of oocysts. It is potentially zoonotic but rarely affects humans who are immunocompetent	Yes

Mitigations measures	Mitigations advised
Faecal parasitology must be performed on all cats entering captive facilities. Faeces should be removed daily. Oocysts are resistant to most disinfectants and can survive for several months in cool and moist conditions. Physical cleaning of the environment is important. All animal workers should wear gloves and practice good hand washing and utensils and surface disinfection. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Cytauxzoonosis	*Cytauxzoon europaeus*, *C. otrantorum,* and *C. banethi*	Medium	Low

Hazard Description

Cytauxzoon species are emerging apicomplexan haemoparasites, order Piroplasmida, family Theileriidae, of wild and domestic cats, transmitted by ticks. Cytauxzoonosis has been reported worldwide in domestic and wildcat species. Domestic cats infected with *Cytauxzoon* or *C. europaeus,* may be asymptomatic or manifest with fever, anorexia and lethargy, tachycardia, tachypnoea, anaemia, weight loss, diarrhoea, vomiting, abdominal pain, subcutaneous haematomas, jaundice, neurologic signs, dyspnoea associated with pleural and peritoneal effusions, and death. Immunocompromised cat, such as those infected by FIV, are more likely to be affected. A survey of 117 free living wildcats in Southern Germany found a 72% prevalence (Obiegala *et al*., 2024), suggesting wildcats could acts a reservoir for the infection

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Unknown	Yes	Yes	Source, Carrier

Transmission pathways of concern:

Cytauxzoon haemoparasites are transmitted by the bite of ticks. The tick vectors for European *Cytauxzoon* are unknown but could be *Dermacentor* spp., *Ixodes* spp., and or *Rhipicephalus* spp. Chronically infected domestic cats could serve as a reservoir since long-lasting parasitaemia up to four years has been documented in asymptomatic individuals. The high prevalence in European wildcats, which appear mainly unaffected, could mean released wildcats imported from Europe could acts as a reservoir for domestic cat infections in the UK

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Medium	Low

Consequences of introduction or exposure	Mitigation possible
There is a risk of imported into the UK that this becomes endemic and released wildcats could also act as a reservoir for infection in domestic cats	Yes

Mitigations measures	Mitigations advised
Disease screening of all cats entering the program includes haematology, which may detect signs such as haemolytic anaemia, which is usually regenerative, macrocytic, and hypochromic. Disease confirmation in suspect clinical cases or carriers, is by PCR. Testing for the presence of *Cytauxzoon* is advised in all cats imported from Europe, as surviving cats can become chronic carriers, and act as reservoirs for disease in domestic cats. All cats need tick and flea treatment both before import from Europe, and at regular treatment schedules once in a captive facility for breeding or release in the UK	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Giardia	*Giardia duodenalis*	Medium	Low

Hazard Description

Giardia are anaerobic flagellated protozoan parasites that colonise and reproduce in the small intestines of several vertebrates, causing the disease giardiasis. Their life cycle alternates between a swimming trophozoite and an infective, resistant cyst. Most of the genotypes (assemblages) considered as feline specific do not appear to infect humans, but zoonotic genotypes isolated from human cases are frequently found in cats. A zoonotic *Giardia duodenalis* Assemblage B was isolated from a free-living European wildcat in Luxembourg (Solarczyk *et al*., 2019). *Giardia* infection is most common in young domestic cats, especially when group housed. Infected cats that develop clinical signs show small intestinal diarrhoea and there may be associated weight loss. Infection can be detected in clinically healthy cats, which act as carriers of the disease. There is a high degree of resistance to fenbendazole and metronidazole veterinary treatments in some areas of the UK

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Carrier, Zoonotic

Transmission pathways of concern:

Transmission is faecal-oral in nature

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Giardia is widespread in many domestic and wild animal species throughout the UK	Medium

Consequences of introduction or exposure	Mitigation possible
Infected cats may develop diarrhoea and weight loss, but many cats show no obvious symptoms and may act as carrier for infection to other animals and humans	Yes

Mitigations measures	Mitigations advised
All animal workers having contact with cat faeces have a risk of occupational exposure to *Giardia* and should wear gloves and practice good hand washing and utensils and surface disinfection. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation

Hepatozoonosis	*Hepatozoon silvestris* and *H. felis*	Low	Low

Hazard Description

Hepatozoon species are apicomplexan parasites, family Hepatozoiae, with a blood-sucking arthropod final host and a vertebrate intermediate host. In in many species the parasite is transmitted by ingestion of the infected arthropod, but meat eating and hunting are also routes of infection for some species, as well as transplacental transmission. The vector for feline hepatozoonosis remains unknown and the pathogenesis has not been elucidated. Feline hepatozoonosis is mainly a subclinical infection, but a few rare cases have been reported with clinical signs associated with the infection. *H. felis* usually results in infection of myocardial and skeletal muscles, but this does not lead to a significant inflammatory reaction around the parasite meronts, so cats rarely develop clinical signs. The prevalence of *H. felis* and *Hepatozoon silvestris* in 540 ticks collected from domestic cats in the UK was less than 0.5% (Duplan *et al*., 2018). A prevalence of 35% *H. silvestris* and 6% *H. felis* was found by PCR in 96 European wildcats in Germany (Unterkofler *et al*., 2022)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Carrier

Transmission pathways of concern:

The vector for feline hepatozoonosis remains unknown but is a blood-sucking arthropod

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Medium

Consequences of introduction or exposure	**Mitigation possible**
Infection rarely results in clinical disease, and the parasite is present in domestic cats in the UK and wildcats in Europe. It carries minimal risks for reintroduction	Yes
Mitigations measures	**Mitigations advised**
Disease screening of all cats entering the program includes haematology, and the diagnosis of hepatozoonosis in cats may be made by observation of parasite gamonts in blood smears. Although the mode of transmission and the type of vector are not known, preventive treatment against blood sucking vectors (fleas and ticks) is advised	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Leishmaniosis	*Leishmania infantum*	Low	Low

Hazard Description

Leishmanioses is caused by trypanosomatid protozoan parasites of several *Leishmania* species and most *Leishmania* species are of zoonotic concern. Dogs are the main reservoir of *Leishmania infantum* but vectorial transmission can involve different host species as reservoirs. Leishmaniosis is less well known in cats than in dogs and humans, and felids were originally considered to be resistant to *Leishmania* infection. Cats are infected by the same *Leishmania* species that infect dogs and humans. Competent sand fly vectors take blood meals from cats and become infected when feeding on cats with *L. infantum*. Only sporadic feline disease cases have been reported worldwide in canine leishmaniosis endemic areas, mainly caused by *L. infantum*. Epidemiological investigations have confirmed, however, that feline infections are not rare and disease occurrence might be underestimated in endemic areas. More than half of cases show dermatological and mucocutaneous lesions (mainly ulcerative and nodular dermatitis) and lymph node enlargement; sometimes these are the two only findings at physical examination. Ocular and oral lesions, as well as general signs such as weight loss, decreased appetite, lethargy, anaemia, hyperglobulinaemia, and proteinuria are reported in cats. Other clinical signs are sporadically reported. Clinical cure can be obtained but the infection is not cleared, and recurrence of clinical signs can occur after cessation of treatment. Prevention in endemic areas of Europe is via pyrethroid (flumethrin) ectoparasiticides which are effective against sand fly bites. The vectors are not present in the UK, and only sporadic cases in domestic pets have been reported after import from Europe

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	No	Yes	Source, Zoonotic

Transmission pathways of concern:

Vectors comprise multiple species of sand fly insects (*Phlebotomus* spp.). These are not present in the UK

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
Phlebotomus spp sand fly vectors are not present in the UK, so even if an infected cat was imported from Europe, it would be a dead-end host and pose little risk to other animals or humans	No
Mitigations measures	**Mitigations advised**
Prevention in endemic areas of Europe is via pyrethroid ectoparasiticides which are effective against sand fly bites. These are usually in the form of a flumethrin collar and not practical for wildcats. A clinical cure can be obtained but the infection is not cleared, and recurrence of clinical signs can occur after cessation of therapy	No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**

Neospora	*Neospora caninum*	Low	Low

Hazard Description

Neospora caninum is a coccidian parasite, and an important cause of spontaneous abortion in livestock. The definitive host are canids such as domestic dogs and foxes, with species like cattle acting as intermediate hosts. It may result in neurological disease in dogs. Antibodies to *N. caninum* were found in 16.7% of 6 European wildcats in Spain (Sobrino *et al*., 2008) indicating exposure, but cats do not appear to be an important source of infection

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Carrier

Transmission pathways of concern:

Oocysts passed in the faeces of the definitive host, most commonly canines such as dogs or foxes, are ingested by an intermediate host, such as cattle. *N. caninum* has been found to infect birds such as house sparrows which may become infected after ingesting parasite oocysts from the soil and then may serve as a food source for wild and domestic carnivores

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Medium

Consequences of introduction or exposure	**Mitigation possible**
Is present in the UK and widespread. Cats do not appear to develop disease naturally or act as a meaningful source of infection	Yes
Mitigations measures	**Mitigations advised**
Testing for *Neospora* antibodies is possible but only indicates exposure of cats. In the definitive host detection of oocysts in the faeces on parasitology is serendipitous, as shedding is not consistent and only for a short period after infection	No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Toxoplasmosis	*Toxoplasma gondii*	High	Low

Hazard Description

The cat is essential to the *Toxoplasma gondii* life cycle because Felidae are the only hosts in which *T. gondii* can reproduce sexually. Cats mainly become infected by eating infected prey mammals or birds, or by being fed raw meat, and less commonly by ingesting oocyst-contaminated food or water. Transplacental and lactogenic transmission occur. Oocyst shedding only occurs once in a cat's lifetime after ingestion of tissue cysts. Oocysts are able to survive for a long time in the environment. Antibody prevalence studies show that around one third of domestic cats becomes infected with *T.*

gondii during their lifetime, yet very few cats appear to develop clinical toxoplasmosis. In cases of disease in cats can manifest as uveitis, neurological signs, raised mesenteric lymph nodes, pneumonia, dyspnoea, muscular pain, lameness, or a myopathy. Previously infected cats that are antibody positive no longer shed oocysts and pose no further risk for humans. Toxoplasmosis is a zoonosis of particular concern in pregnancy, as it can result in abortions, but most human cases actually occur from eating meat containing tissue cysts or unwashed raw vegetables rather than cats. Oocysts only sporulate 2 days after excretion in faeces and are not infectious before then.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Zoonotic

Transmission pathways of concern:

Cats become infected by eating infected prey mammals or birds, or eating raw meat, and occasionally by ingesting oocyst-contaminated food or water. Transplacental and lactogenic transmission occur in cats. Oocyst shedding normally happens only once in a cat's lifetime, about 4-11 days after ingestion of tissue cysts. Oocysts can survive for over 100 days in the environment, in soil and water. *T. gondii* antibody positive cats no longer shed oocysts, and neither are, nor will become, a risk for humans. Toxoplasmosis in humans is mainly caused by eating meat containing tissue cysts or unwashed raw vegetable. It is mainly a zoonotic risk to pregnant women, as it may cause abortion, and in severely immunocompromised individuals. Oocysts are not infectious until they have sporulated 2 days after excretion in faeces

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Toxoplasma is already widespread in domestic and wild animals in the UK	High

Consequences of introduction or exposure	**Mitigation possible**
Despite a high prevalence, only sporadic cats are clinically affected or developing eye lesions, so rare disease would likely only affect an individual wildcat's health and welfare. The infection does pose a zoonotic risk to humans when a cat is first infected and actively shedding oocysts, mainly during pregnancy or if an individual is immunocompromised	Yes
Mitigations measures	**Mitigations advised**
Workers should wear gloves and practice good hand washing and utensils and surface disinfection, and good disinfection of captive enclosures. Faeces should ideally be removed from enclosures daily as oocysts are not infectious until they have sporulated 2 days after excretion in faeces. All animal workers having contact with cat faeces have a risk of occupational exposure to *Toxoplasma*. Pregnant workers can safely work with cats with these adequate risk mitigations in place but should be subject to a separate risk assessment based on the specific circumstances. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Trichomoniasis	*Tritrichomonas foetus* and *T. blagburni*	High	Low

Hazard Description

Tritrichomonas foetus is a single-celled highly motile flagellate protozoan parasite that can cause predominantly large intestinal diarrhoea in cats. It is specific to cats, distinct from other *Tritrichomonas* species and not considered to be zoonotic. Infection is most common in younger cats especially under 12 months old, and it poses a risk in groups of captive cats. Affected cats may show strong smelling diarrhoea, often with mucus or fresh blood, and straining, but cats usually remain bright and do not lose weight. Clinical signs are usually self-limiting in untreated cases but can sometimes take months to resolve. While *T. foetus* is also recognized as a sexually transmitted parasite of the reproductive tract of cattle and a commensal in pigs' nasal cavities, *T. foetus* isolated from cats does not cause the same pathology as bovine isolates in experimental infection of cattle, and vice versa. Cat strains are different from bovine and porcine strains, which are more closely related. A 9% prevalence was found in 124 samples of free-living feral and Scottish wildcat hybrids trapped for disease screening and domestic feral cat trap-neuter-vaccinate-release program (Bacon *et al*., 2023)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Carrier

Transmission pathways of concern:

Trophozoites are excreted in the faeces, and transmission occurs via the faecal-oral route. The trophozoites have a limited ability to survive outside the body and do not persist in the environment. They can remain viable for a few days in moist faeces. Mutual grooming may also transfer the parasite. *T. foetus* is not sexually transmitted and does not infect the reproductive tract of cats

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The organism is widespread in feral cats in the UK	Medium

Consequences of introduction or exposure	Mitigation possible
The main risk is from transmission of asymptomatic carrier cats to young cats in a captive breeding facility, which could impact successful operations as this can take months for affected cats to fully recover	Yes

Mitigations measures	Mitigations advised
PCR testing of faeces is sensitive, and can detect infections unrelated to diarrhoea, indicating carrier cats, and should be part of screening of any founder cats in a	Yes

captive facility. Workers should wear gloves and practice good hand washing and utensils and surface disinfection, and good disinfection of captive enclosures	

Ectoparasites

Infectious Disease	Agent	Risk rating	Risk after mitigation
Demodex otitis externa	*Demodex cati*	Low	Low

Hazard Description

Demodex are a skin mite normal living in hair follicles and usually do not cause any symptoms or disease in most cats. If disease occurs it can be localised or generalised. Localised disease can involve the eyelids, head or neck, and with localised alopecia, variable pruritus (itching) and erythema. *Demodex* has also been reported as causing ceruminous otitis externa alone in domestic cats. Lesions in generalised disease are multifocal patchy alopecia, and may also scaling, and crusts. If disease signs do occur this may be idiopathic, or the disease may be associated with an underlying immunosuppressive disease such as stress, feline immunodeficiency virus (FIV), feline leukaemia virus (FeLV), or toxoplasmosis, that requires diagnosis and management. Disease can occur in any age cat and is not contagious.

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes	Captivity, Carrier

Transmission pathways of concern:

Disease can occur in any age, breed or sex and is not contagious, as *Demodex* are a normal skin mite living in hair follicles

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Demodex are a normal skin mite living in the hair follicles of cats and is already present in the UK	All wildcats will have *Demodex* as a normal skin mite living in their hair follicles

Consequences of introduction or exposure	Mitigation possible
If disease signs do occur this may be idiopathic, or the disease may be associated with an underlying immunosuppressive disease such as feline immunodeficiency virus (FIV), feline leukaemia virus (FeLV), or toxoplasmosis, that requires diagnosis and management	Yes

Mitigations measures	Mitigations advised
Stress limitation in captivity (which can result in immunosuppression) can be helpful in preventing clinical disease. If disease signs do occur diagnostic investigations to rule out more serious underlying disease-causing immunosuppression, such as feline immunodeficiency virus (FIV) or feline leukaemia virus (FeLV) are essential	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Ear mites	*Otodectes cynotis*	Low	Low

Hazard Description

Otodectes are external parasites of dogs and cats but can be found on other mammals. They occur worldwide. They are found in the ear canal of their hosts and can cause irritation of the ear canal leading to otitis externa. The mite does not live in the environment and requires direct contact between cats for transmission. A Germany survey of wildcats found a prevalence of *Otodectes cynotis* in 5% of 124 cats (Bisterfeld *et al*., 2024). They did not appear to have any notable impact on the general health of wildcats, as judged by the hosts' mostly good or very good nutritional condition

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Carrier, Zoonotic

Transmission pathways of concern:

Transmission is by direct contact between cats, as the mite does not live in the environment

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Otodectes are already widely present in cats and other mammals in the UK	Medium

Consequences of introduction or exposure	Mitigation possible
In most cases infection with *Otodectes* in domestic cats and in wildcats examined does not cause clinical illness and only in some individual cases causes irritation and otitis externa	Yes

Mitigations measures	Mitigations advised
All wildcats in captivity breeding and prior to release would have their ears examined and should be treated with an effective broad-spectrum ectoparasiticide treatment	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Fleas	*Ctenocephalides felis*	High	Low

Hazard Description

Ctenocephalides felis is the most common flea found parasitising both domestic cats and dogs. Numerous flea species have been recorded on wildcats, including *Ceratophyllus sciurorum, Nosopsyllus fasciatus*, *Pulex irritans*, *Spilopsyllus cuniculi*, *Chaetopsylla trichosa*, *Chaetopsylla globiceps*, *Archaeopsylla erinacei* and *Ctenophthalmus baeticus*. Fleas cause severe irritation in animals and people and are responsible for flea allergy dermatitis. Fleas can cause iron-deficiency anaemia in heavily infested hosts, especially young kittens. Fleas are also important vectors involved in the transmission of diseases including Feline Calicivirus, Feline bartonellosis, Tick-bite fever, and the flea tapeworm *Dipylidium caninum*. A survey of 131 European wildcats in Germany found 27% were positive for at least one flea species (Bisterfeld *et al*., 2024)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Zoonotic

Transmission pathways of concern:

Cat fleas deposit their eggs in the hair coat of their host, which then fall and hatch on substrates such as bedding or soil. Hatched flea larvae are free-living, feeding on organic debris found in their environment and on adult flea faeces, which are essential for successful development. Flea larvae avoid direct light and actively move deep in bedding or under organic debris such as grass, leaves, or soil. Depending on temperature and humidity, the entire life cycle of the cat flea can be completed in as little as 12–14 days or can be prolonged for up to 350 days

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Fleas are widespread on domestic and wild animals throughout the UK	High

Consequences of introduction or exposure	**Mitigation possible**
Fleas cause severe irritation in animals and people and can cause anaemia in heavily infested young kittens. Fleas are important vectors involved in the transmission of numerous diseases including Feline Calicivirus, Feline bartonellosis, Tick-bite fever, and the flea tapeworm *Dipylidium caninum*	Yes
Mitigations measures	**Mitigations advised**
Wildcats need treatment for both fleas and ticks before entering a captive facility, but also a regular prophylactic program such as recommended by manufacturer for domestic cats, and an environmental residual flea treatment should be used to treat enclosures between different groups of animals, or should an outbreak occur	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Harvest mites	*Neotrombicula autumnalis*	Low	Low

Hazard Description
Neotrombicula autumnalis, known as the harvest mite, is a species of mite of the family Trombiculidae. The mites are a bright orange-red colour. Their larvae live parasitically; they infect mammals, humans, and some ground-nesting birds. The eggs are laid in damp soil. After hatching, the larvae climb blades of grass and wait for a potential host. After attaching to a host, they inject digestive enzymes into the skin that break down skin cells. They do not actually bite but instead form a hole in the skin called a stylostome and chew up tiny parts of the inner skin, thus causing irritation and swelling. and feed on their tissues. After sucking, which lasts several days they fall off and develop over three stages of nymph to adult mites. Larva, by embedding their mouthparts into the skin cause irritation, a wheal, usually with severe itching and dermatitis. Humans are possible hosts. They are most numerous in early summer when vegetation is heaviest. The post-larval stages are not parasitic and feed on plant material. The females lay eggs in a clutch, usually on a leaf or among the roots of a plant and die by autumn. A survey of 131 European wildcats in Germany found 12% harboured *Neotrombicula autumnalis* (Bisterfeld *et al*., 2024)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Destination, Zoonotic

Transmission pathways of concern:
Larval forms of the mite climb onto hosts from grass or vegetation

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Harvest mites are widely distributed in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
Individual wildcats could get affected by larval mites attaching to feed once released. While harvest mites are zoonotic wildcats would not likely act as a meaningful source for human infection	Yes
Mitigations measures	**Mitigations advised**
Wildcats in captivity would have regular prophylactic treatment for ectoparasites like fleas and ticks before entering and while in a captive facility, and this would reduce the likelihood of infection, but infections sometimes need topical treatment as mites may be localised to a location such as between a cat's toes	No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Lice	*Felicola subrostratus*	Low	Low
Hazard Description			

These chewing type lice, feeding on hair and skin are found on domestic cats and can be found on wild felids. Most lice infections cause no clinical signs or problems. Severe lice infections can cause skin irritation and biting and itching of the skin. Lice can also carry Feline bartonellosis, an infection that can affect cats and humans. A German survey of 131 wild European wildcats found a prevalence of 2.3% of this louse			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Destination
Transmission pathways of concern:			
Transmission occurs by close contact between cats			
Likelihood of disease introduction or release		**Likelihood of exposure to the introduced wildcats**	
Low		Low	
Consequences of introduction or exposure			**Mitigation possible**
Due to the widespread use of ectoparasitic treatments for other parasites such as fleas, lice infections are now rare except in some feral cats			Yes
Mitigations measures			**Mitigations advised**
All wildcats in captivity breeding and prior to release would have their ears examined and should be treated with an effective broad-spectrum ectoparasiticide treatment			Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Mange	*Sarcoptes scabiei*	Low	Low
Hazard Description			
Sarcoptes scabiei is a burrowing skin mite, that can affect animals and people, causing sarcoptic mange in animals and scabies in people. It results in severe irritation and itching and can also cause alopecia and skin changes such as crusting. Immunocompromised individuals can develop more severe disease. Sarcoptic mange has been described in a single dead European wildcat in Spain (Najera *et al*., 2021)			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Carrier, Zoonotic
Transmission pathways of concern:			

Transmission is by close contact (skin to skin). Transmission via fomites (bedding, equipment) is rare		
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**	
Low	Low	
Consequences of introduction or exposure		**Mitigation possible**
Sarcoptic mange could spread between in contact cats in a captive facility and spread to human handlers having contact with them if not using protective gloves. However, mange is not common in cats, and wildcats pose a low zoonotic risk to people working with them unless evidently affected		Yes
Mitigations measures		**Mitigations advised**
Workers working with captive wildcats and cleaning enclosures should always wear gloves. Wash and dry any bedding and cloth used with captive wildcats using a hot water cycle. If sarcoptic mange is suspected or diagnosed dispose of bedding or after washing dry in sunlight or a hot cycle in a clothing dryer. Washing machines and dryers if used in a captive wildcat facility should have separate units for animal bedding and equipment from those used for human clothing. All wildcats entering a captive breeding or release facility, or any cats showing abnormal skin conditions must undergo a full veterinary examination under anaesthesia, and any skin lesions investigated dermatologically with appropriate tests such as skin scrapes, cellotape preparation, and dermatophyte testing. Immunocompromised individuals should ideally not work in contact with captive wildcats due to the risk of numerous potentially zoonotic infections in cat species		Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Red mite	*Dermanyssus gallinae*	Low	Low
Hazard Description			
The red mite is an ectoparasite of birds but can affect a wide range of host including mammal and humans. Due to their rapid life cycle numbers can build up rapidly and not be noticed. They can act as vectors to spread other infectious diseases in a building. Infestation is rare in cats, but can manifest as itching from bites, predominately on the legs and the back			

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Captivity
Transmission pathways of concern:			
Mites can be brought into a captive setting by wild birds. Mites live off the host in cracks and crevices, where they lay their eggs. They come out at night to feed on their hosts. They have a rapid lifecycle			

that can be completed in as little as 7 days. They can survive in an empty building or structure for up to 10 months		
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**	
Already widespread in the UK	Low	
Consequences of introduction or exposure		**Mitigation possible**
Individual cats may develop skin irritation if affected in captivity.		Yes
Mitigations measures		**Mitigations advised**
Good enclosure hygiene, cleaning as routine. Any evident mite infestation can be treated with normal commercial flea treatment and enclosure treated with a residual Permethrin based spray such as Indorex (Virbac)		Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Ticks	*Ixodes ricinus*, *I. hexagonus/canisuga*, *Haemaphysalis erinacei* and others	Medium	Low

Hazard Description

Ticks are obligate ectoparasites of terrestrial vertebrates and are large mites and thus are arachnids, members of the subclass Acari. They are exclusively blood-sucking in all feeding stages. Ticks transmit a greater variety of infectious organisms than any other group of arthropods including Q fever, tick-bite fever, Tularaemia, Babesiosis, Cytauxzoonosis, and Hepatozoonosis amongst others. Ticks can harm their hosts directly by inducing toxicosis (e.g., sweating sickness, tick paralysis) caused by salivary fluids containing toxins), skin wounds susceptible to secondary bacterial infections, and anaemia and death. A survey of 131 European wildcats in Germany for ectoparasites showed ticks had the highest prevalence of all ectoparasites, with 73%of wildcats infested, 50% with *Ixodes ricinus* and 37 with *Ixodes hexagonus/canisuga* (Bisterfeld et al, 2024)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination, Zoonotic

Transmission pathways of concern:

Ticks can transmit infectious agents during their blood-sucking. Ticks can fast for long periods of time but eventually die if unable to find a host. Ticks find their hosts by detecting an animals' breath and body odours, sensing body heat, moisture, or vibrations. Many tick species, particularly

Ixodidae, lie in wait in a position known as "questing". While questing, ticks cling to leaves and grasses by their third and fourth pairs of legs. They hold the first pair of legs outstretched, waiting to grasp and climb on to any passing host		
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**	
Low with mitigation treatment, but otherwise there is a high risk of them introducing important zoonotic diseases not present in the UK including tick-bite fever and Tularaemia	High	
Consequences of introduction or exposure		**Mitigation possible**
Ticks can cause illness of individual cats and bite human workers, and there is a high risk of them introducing important zoonotic diseases not present in the UK including tick-bite fever and Tularaemia if present on wildcats imported from Europe		Yes
Mitigations measures		**Mitigations advised**
Wildcats need treatment for both fleas and ticks before entering a captive facility, but also a regular prophylactic program such as recommended by manufacturer for domestic cats		Yes

Endoparasites

Trematodes (Flukes)

Infectious Disease	Agent	Risk rating	Risk after mitigation
Biliary fluke	*Metorchis bilis*	Low	Low

Hazard Description

Biliary flukes infect the liver and gallbladders of mammals eating freshwater fish, including wildcats, as well as humans eating raw fish. *Metorchis bilis* was found in 2% of 101 wildcat livers examined at post-mortem examination in Germany (Bisterfeld *et al*., 2024). The parasite in mammals can affect the liver, pancreas, and gall bladder. The parasite has been in otters in England (Sherrard-Smith *et al*., 2016) The first intermediate hosts are freshwater snails while the second intermediate hosts are freshwater fish. The definitive hosts are mammals that eat fish raw. The parasite is already present in the UK and seems to have minimal impact and has only been reported in wild otters.

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

The first intermediate hosts are freshwater snails while the second intermediate hosts are freshwater fish. The definitive hosts are mammals that eat fish (raw). Wildcats could only be infected if eating raw affected freshwater fish

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The infection is already present in the UK	Low

Consequences of introduction or exposure	Mitigation possible
Consequences are minimal. The infection is already present in the UK in otters and rivers in England, but appears to cause little notable pathology in otters, and most infections appear asymptomatic in wildcats and domestic cats. Despite being a zoonosis, an infected wildcat would not act as a direct source for human infection, due to the parasite's lifecycle.	Yes

Mitigations measures	Mitigations advised
As part of disease screening faecal parasitology is essential. No drug has been licenced and tested as effective against liver flukes in cats, but Praziquantel is used effectively in humans and is the treatment of choice should a cat test positive. If a cat tested positive on faecal parasitology, testing must be repeated	Yes

2 weeks after treatment to ensure this has been effective. Captive wildcats should not be fed raw freshwater fish (freezing of fish is ineffective in preventing infection, any fish fed must be cooked)	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Cat liver fluke	*Opisthorchis felineus*	High	Low

Hazard Description

This parasite is not present in the UK. This fluke infects the liver in mammals, including humans, and signs of illness range from asymptomatic infection to severe illness. The parasite in mammals may affect the liver, pancreas, and gall bladder. If not treated early, opisthorchiasis may cause cirrhosis of the liver and increased risk of liver cancer in people. This parasite is not in the UK but occurs in Europe. Distribution of *Opisthorchis felineus* includes Spain, Italy, Albania, Greece, France, Macedonia, Switzerland, Germany, Poland, Russia, Turkey, and Caucasus. Inadvertent introduction could establish the parasite in UK rivers and affect other wildlife, domestic and wild animals, and people (but only if eating undercooked or raw infected fish). It is estimated that over a million people in Russia are infected with this parasite, due to eating raw, lightly salted, or frozen fish

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	No	Yes	Source, Zoonotic

Transmission pathways of concern:

The first intermediate hosts are freshwater snails of the *Bithynia* genus (found in the UK). The second intermediate hosts are freshwater fish. The definitive hosts are mammals that eat fish (raw) and would include otters (*Lutra lutra*). While fish are not a meaningful component of wildcat diets, captive feeding or raw fish, or scavenging of fish in range countries of wildcats later imported into the UK pose a risk

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Low

Consequences of introduction or exposure	**Mitigation possible**
The consequences for any individual imported wildcat that was infected would likely be mild, but inadvertent introduction could establish the parasite in UK rivers, snails, and fish and affect other wildlife such as otters, as well as domestic animals, and people (if eating undercooked or raw infected fish)	Yes
Mitigations measures	**Mitigations advised**
As part of disease screening before any imports of wildcats from Europe faecal parasitology is essential, and all cats to be imported must additionally be treated with a endoparasite treatment. No drug has been licenced and tested as effective	Yes

against liver flukes in cats, but Praziquantel is used effectively in humans and is the treatment of choice. If a cat tested positive on faecal parasitology, testing must be repeated 2 weeks after treatment to ensure this has been effective. Cats due for import from range countries must not be fed raw fish. Freezing of fish is ineffective in preventing infection, any fish fed must be cooked	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Liver fluke	*Pseudoamphistomum truncatum*	Low	Low

Hazard Description

These flukes infect the liver and gallbladders of mammals eating freshwater fish, including humans eating raw fish. The parasite in mammals may affect the liver, pancreas, and gall bladder. The parasite has been found in domestic cats, and in the UK has been recorded in otters in England (Simpson *et al*., 2005) The first intermediate hosts are freshwater snails while the second intermediate hosts are freshwater fish. The definitive hosts are mammals that eat fish raw. The parasite is already present in the UK and seems to have minimal impact and has only been seen in wild otters

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

The first intermediate hosts are freshwater snails while the second intermediate hosts are freshwater fish. The definitive hosts are mammals that eat fish (raw). Wildcats could only be infected if eating raw affected freshwater fish

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The infection is already present in the UK	Low

Consequences of introduction or exposure	**Mitigation possible**
Consequences are minimal. The infection is already present in the UK in otters and rivers in England, but appears to cause little notable pathology in otters, and has not been reported causing notable pathology in cats in the UK	Yes

Mitigations measures	**Mitigations advised**
As part of disease screening faecal parasitology is essential. No drug has been licenced and tested as effective against liver flukes in cats, but Praziquantel is used effectively in humans and is the treatment of choice should a cat test positive. If a cat tested positive on faecal parasitology, testing must be repeated 2 weeks after	Yes

treatment to ensure this has been effective. Captive wildcats should not be fed raw freshwater fish (freezing of fish is ineffective in preventing infection, any fish fed must be cooked)	

Nematodes (Roundworms)

Infectious Disease	Agent	Risk rating	Risk after mitigation
Aelurostrongylus	*Aelurostrongylus abstrusus*	Medium	Low

Hazard Description

Aelurostrongylus abstrusus, like most feline lungworm infections may be asymptomatic, or cause mild to severe respiratory signs due to bronchopneumonia, sometimes complicated by pleural effusion or pneumothorax, and cats can show nasal discharge, tachypnoea, dyspnoea and/or coughing. This parasitic nematode has an indirect life cycle, with snails and slugs as intermediate hosts, and other species including rodents and birds acting as paratenic hosts. The disease can occasionally be fatal in kittens or immunocompromised cats. Kittens may be vertically infected and develop more severe disease. *A. abstrusus* and *Troglostrongylus brevior* often cause mixed infections in mainland Europe as they share the same intermediate and paratenic hosts, and there is a report in Greece of an ill wildcat infected with 4 species of lungworm. A survey in Germany found a prevalence of 42% in 128 European wildcats (Bisterfeld *et al*., 2022), but a prevalence of only 4% % was found in 47 roadkill wildcats in Romania (Deak *et al*., 2022). There is a single report of a severe fatal mixed infection with *A. abstrusus* and *A. chabaudi* in a European wildcat from Bosnia, the cats also having not only a severe verminous bronchopneumonia, but also gastrointestinal nematode and cestode infection with *Toxocara cati*, *Taenia taeniaeformis*, *Aonchotheca putorii*, and *Ancylostoma* spp (Stevanovic *et al*., 2019)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

Aelurostrongylus abstrusus has an indirect life cycle involving snails and slugs. Eggs laid by female worms hatch in the respiratory tract of cats and L1 larvae are coughed up, swallowed and eliminated in the environment with the faeces. They can actively enter slugs or snails and moult into the infectious L3 stage. While slugs and snails are not usually ingested by cats infective larvae of are shed in the mucus of snails and are found in water where infected gastropods may die submerged, so drinking water can be a source of infection for cats. The infectious L3 larvae of *A. abstrusus* are also found in a wide range of paratenic hosts including rats, mice, frogs, and birds commonly predated by cats, as well as cockroaches

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Aelurostrongylus abstrusus is already present in the UK	High

Consequences of introduction or exposure	Mitigation possible
Cardio-pulmonary nematodes appear to be common parasites in European wildcats in mainland Europe but do not appear to have a serious impact on the	Yes

overall health of the population. Due to presumed spillover events via prey, cardio-pulmonary nematodes may circulate between the wildcat population and domestic cats and might therefore pose a health risk to individual domestic cats	
Mitigations measures	**Mitigations advised**
Faecal parasitology, including Baermann faecal analysis specifically for lungworm is indicated as part of disease screening, but all wildcats entering captive care and before release should still be treated for endoparasites, including lungworm, as larvae are only shed intermittently in faeces. Sensitivity of faecal testing in enhanced if a 3-day pooled faecal sample is submitted. Fenbendazole is licensed for the treatment of *A. abstrusus* infection, as are spot-on solutions containing eprinomectin and emodepside. Other spot-on preparations have also demonstrated 100 percent efficacy against the parasite, including moxidectin and selamectin but their use is off licence	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Bladder worm	*Capillaria plica* and *C. feliscati*	Low	Low

Hazard Description

Capillaria plica and *C. feliscati* may infect the urinary bladder, and occasionally the ureters and renal pelvises of cats Their main final hosts are wild carnivores including foxes, wildcats, and hedgehogs. Its occurrence is rare. Cats become infected by eating earthworms that contain the first-stage larvae. Most cats are asymptomatic. Some animals show signs of pollakiuria, urinary incontinence, and urinating in abnormal places. The eggs are shed in the urine and may be found in the urine sediment. 78% of the urinary bladders of 99 wildcats examined in Germany, *C. plica* and/or *C. feliscati* were detected

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Destination, Carrier

Transmission pathways of concern:

Cats become infected by eating earthworms that contain the first-stage larvae. The worm eggs are shed in the urine.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Capillaria bladderworms are present in the UK, but rarely cause disease in cats	Low

Consequences of introduction or exposure	**Mitigation possible**

Capillaria bladder worms are rare and most often asymptomatic, but if did result in disease would likely only affect an individual wildcat	Yes
Mitigations measures	**Mitigations advised**
Capillaria bladderworms are sensitive to many broad-spectrum routine treatments for endoparasites. Captive wildcats should be routinely wormed, which should eliminate the risk for *Capillaria* bladderworms	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Capillariasis	*Capillaria Aerophila*, *C. putorii*, and other spp	Medium	Low

Hazard Description

Cat lungworm infections with *Capillaria (Eucoleus) areophila* are sporadically seen in the UK and most cases are subclinical. Foxes are the main reservoir in the UK. *Capillaria aerophila* has zoonotic potential and sporadic cases of human capillariosis have been described, causing a productive cough, haemoptysis and lung lesions. Clinical signs in cats include coughing, sneezing and dyspnoea, with or without tachypnoea. There is a report in Greece of an ill wildcat infected with 4 different species of lungworm. A survey in Germany found a prevalence of 3% for *Capillaria* spp. in 128 European wildcats (Bisterfeld *et al*., 2022), while a prevalence of 34% was found in 47 roadkill wildcats in Romania (Deak *et al*., 2022)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:

Capillaria aerophila has a direct cycle with faeco-oral transmission. Eggs laid by female worms in the respiratory tract in cats, foxes or other hosts are swallowed and reach the environment in the faeces. After 30-45 days, embryonated eggs become infective when ingested by cats. Earthworms are facultative paratenic hosts. When cats ingest infective eggs or earthworms carrying larvae, the larvae migrate to the lung and develop into the adult stage in 3-6 weeks

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Capillaria aerophila is already present in the UK, mainly in the wild fox population	Medium

Consequences of introduction or exposure	**Mitigation possible**
Capillaria aerophila lung worms are present in the UK in foxes and only cause sporadic disease in domestic cats and wildcats. There is a small risk of introduction	Yes

of other *Capillaria* spp. not present in the UK being introduced if untested and untreated wildcats are imported from Europe. The main risk is as a zoonotic agent infecting animal workers handling wildcats and their faeces	
Mitigations measures	**Mitigations advised**
Faecal parasitology, via flotation is indicated as part of disease screening, but as shedding of these eggs may be intermittent faeces a 3-day pooled faecal sample should be submitted. While there is no product licensed for the treatment or prevention of *C. aerophilus* infection in the UK, a spot-on preparation of moxidectin has been shown in one study to have close to 100 percent efficacy against infection. As a zoonotic infection all animal workers having contact with cat faeces should exercise appropriate hygienic precautions, such as wearing gloves when handling faeces and cleaning, and good hand washing and utensils and surface disinfection	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Cylicospirura	*Cylicospirura felineus, C. subaequalis, and C. petrowi*	Medium	Low

Hazard Description

Cylicospirura are a genus of gastrointestinal spirurid nematodes that can infect felines causing mucosa nodules in the pylorus of the stomach and the duodenum. Most infections are asymptomatic, but cases of peritonitis have been reported in felids. A prevalence of 35% was found in wildcats in Greece (Diakou *et al*., 2021), and a prevalence of 38% in Germany in 104 wildcats (Bisterfeld *et al*., 2024), while a prevalence of only 2% was found in 121 scat samples from wildcats in Italy (Napoli *et al*., 2016)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	Yes	Yes, puma, bobcat, leopard, and lions	Source, Captivity, Carrier

Transmission pathways of concern:

Faeco-oral transmission

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Low	Medium

Consequences of introduction or exposure	**Mitigation possible**
Most infected cats appear asymptomatic, but an individual cat could be adversely affected as develop signs such as peritonitis with a severe infection	Yes

Mitigations measures	Mitigations advised
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. All captive cats should be dewormed quarterly with a licenced prescription product suitable and effective for domestic cats	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Dirofilaria	*Dirofilaria immitis*	Medium	Low

Hazard Description

Dirofilaria filarial worms, are vector-borne nematodes infecting mainly dogs but also cats, ferrets, wild carnivores and humans. They are not endemic in the UK. *Dirofilaria immitis* causes heartworm disease and *D. repens* causes subcutaneous dirofilariosis. *D. immitis* adults reside in pulmonary arteries and right heart chambers whereas those of *D. repens* arelocated in subcutaneous tissues. *Dirofilaria immitis* and *D. repens* are the most important filarial worms causing heartworm disease and subcutaneous dirofilariosis, respectively. Their life-cycle involves an intermediate mosquito host of *Culex* and *Aedes* spp. Compared to dogs, cats are imperfect hosts to *Dirofilaria* worms. After inoculation, only a low number of L3 larvae develop to the adult stage, in a small percentage of cats. Heartworm disease in cats may be associated with severe pulmonary thromboembolism and eosinophilic inflammatory response in the lungs, possibly leading to sudden death. Otherwise, self-cure occurs in most cases in 18-48 months. Subcutaneous dirofilariosis may present as subcutaneous nodules or dermatitis. Diagnosis in cats is more difficult compared to dogs and needs a multistep approach (antigen and antibody tests as well as diagnostic imaging). A prevalence of 4% was found in 47 roadkill wildcats in Romania (Deak *et al*., 2022), while 15.8% of 19 wildcats tested in North East Italy were antigen positive on serum sampling (Grillini *et al*., 2022)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
No	Yes	Yes	Source, Zoonotic

Transmission pathways of concern:

Dirofilaria are transmitted by *Culex* and *Aedes* spp. mosquitoes, which are intermediate hosts

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Low	Low

Consequences of introduction or exposure	Mitigation possible
While *Dirofilaria* are not endemic in the UK, sporadic cases occur in imported dogs. Cats are imperfect hosts to *Dirofilaria* worms in comparison to dogs and are less likely to infect mosquitoes. As the intermediate hosts are not present in most of the UK most of the year, even should an infected cat enter the UK the risk of	Yes

transmission and establishment to the UK is low, but important, as the infection is zoonotic	
Mitigations measures	**Mitigations advised**
All wildcats to be imported from Europe should be treated with medication for possible heartworm before import into the UK to limit risk. Diagnosis in cats is more difficult compared to dogs needing antigen and antibody tests as well as diagnostic imaging, so prophylactic treatment before import is the main approach at mitigation rather than screening testing	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Eyeworm	*Thelazia callipaeda*	High	Low

Hazard Description

The eyeworm *Thelazia callipaeda* is found in Europe and spread between a variety of mammals including cats and humans by the males of *Phortica variegata*, a drosophila fly feeding on tear secretions. Symptoms of infection include irritation and inflammation, conjunctivitis, excessive tear production, visual impairment, and ulcers or scarring of the cornea. While *Thelazia callipaeda* does not occur in the UK *Phortica variegata* do occur in regions of Southern England, highlighting the potential for *Thelazia* introduction and establishment in the UK. Eyeworm is an emerging zoonotic disease in parts of Europe.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	Yes	Yes	Source, Zoonotic

Transmission pathways of concern:

Male fruitflies *Phortica variegata* are the intermediate host of the zoonotic nematode *Thelazia callipaeda,* spread L3 larvae when feeding on a host's tears

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
While *Thelazia callipaeda* does not occur in the UK, *Phortica variegata* do occur in regions of Southern England, highlighting the potential for *Thelazia* introduction and establishment in the UK	Low

Consequences of introduction or exposure	**Mitigation possible**
This zoonotic disease is emerging in Europe and has a high potential to become established in the UK, as the vector fruitflies are already present in regions of	Yes

England. This is more likely to occur by the movement of pet dogs from Europe, but imported wildcats do pose a risk	
Mitigations measures	**Mitigations advised**
Insect repellents are usually ineffective against vectors and preventing the disease. Topical or systemic anthelmintic treatments, such as ivermectin, milbemycin or spot-on moxidectin can clear disease, as should be administered to any wildcats before importation to the UK from Europe	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
French heartworm	*Angiostrongylus chabaudi* and *A. vasorum*	High	Low

Hazard Description

Angiostrongylus chabaudi is a lungworm affecting wild and domestic cats in Europe, and it is not currently present in the UK. It has an indirect life cycle, with snails and slugs as intermediate hosts. Like most feline lungworm infections it may be asymptomatic, or cause mild to severe respiratory signs due to bronchopneumonia, and cats can show nasal discharge, tachypnoea, dyspnoea and/or coughing. The disease can occasionally be fatal in kittens or immunocompromised cats. Kittens may be vertically infected and develop more severe disease. There is a report in Greece of an ill wildcat infected with 4 different species of lungworm. A survey in Germany found a prevalence of 53% for *Angiostrongylus chabaudi* in 128 European wildcats (Bisterfeld *et al*., 2022), while a prevalence of 23% was found in 47 roadkill wildcats in Romania (Deak *et al*., 2022)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	Yes	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

Angiostrongylus chabaudi has an indirect life cycle involving snails and slugs. Eggs laid by female worms hatch in the respiratory tract of cats and L1 larvae are coughed up, swallowed and eliminated in the environment with the faeces. They can actively enter slugs or snails and moult into the infectious L3 stage. While slugs and snails are not usually ingested by cats, infective larvae of are shed in the mucus of snails and are found in water where infected gastropods may die submerged, so drinking water can be a source of infection for cats

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
High from imported wildcats if not screened and treated, due to its high prevalence in European wildcats	Low

Consequences of introduction or exposure	Mitigation possible
Cardio-pulmonary nematodes appear to be common parasites in European wildcats in mainland Europe but do not appear to have a serious impact on the overall health of the population. This parasite is not currently established in the UK and spillover from released wildcats originating in Europe into prey animals in the wild could establish the parasite and pose a health risk to individual domestic cats in the UK	Yes
Mitigations measures	**Mitigations advised**
Faecal parasitology, including both flotation and a lungworm detection technique such as Baermann faecal analysis is indicated as part of disease screening before any wildcats are imported from Europe, but all wildcats should still be treated for endoparasites, including lungworm, before import from Europe, as larvae are only shed intermittently in faeces. Sensitivity of faecal testing in enhanced if a 3-day pooled faecal sample is submitted	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Gastric worms	*Ollulanus tricuspis*	Medium	Low

Hazard Description

Ollulanus tricuspis is a Trichostrongyle nematode that infects domestic cats and wild felids, and occasionally pigs, foxes and dogs, and is present in Europe. *Ollulanus tricuspis* adults live in the stomach, burrowing into the gastric mucosa. The larva can leave the animal in the vomitus and infect another animal when they ingest the vomit. Most infected domestic cats are asymptomatic, although occasionally vomiting, anorexia, weight loss or gastritis are seen in heavy infestations. *O. tricuspis* infections in pigs can result in chronic gastritis. Diagnosis is difficult due to the small size of the parasite and the lack of eggs or larva in the faeces, and often diagnosis is only made at necropsy. *O. tricuspis* infections can be successfully treated with common worm treatments for cats such as fenbendazole.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes, domestic cats, cheetah and other felids	Source, Destination

Transmission pathways of concern:

Gastric worm larvae are vomited up and infect another animal when they ingest the vomit.

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The parasite is already present in domestic cats, and likely wildcats in the UK	Low

Consequences of introduction or exposure	Mitigation possible
Most cats are asymptomatic, and it is likely only an individual cat may be affected by symptoms if infected. Because of the prevalence and uncertainty surround gastritis and *Helicobacter* organisms in Scottish wildcats this parasite could be a factor in wildcats developing gastritis	Yes
Mitigations measures	**Mitigations advised**
As the eggs and larva of this parasite are not shed in the faeces, routine faecal parasitology will not detect infection. All captive cats should be treated with a broad-spectrum worm treatment such as fenbendazole or other, according to manufacturer's schedule for domestic cats, and all wildcats should be treated the month before release	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Giant kidney worm	*Dioctophyma renale*	Low	Low

Hazard Description

The giant kidney worm adult lives in the kidney of mammals, after they ingest an infected paratenic hosts, usually a fish or frog. Symptoms can include blood in urine, nephritis, and abdominal pain, and in occasional cases death (rare). Adult worms usually only infect one kidney, most commonly the right kidney. While the infected kidney is severely damaged by fibrosis, the infected animal is usually not majorly affected as the normal kidney has sufficient capacity for the workload. Infection has not been reported in European wildcats, but very occasionally occurs in individual domestic cats in parts of Europe.

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source, Captivity, Destination

Transmission pathways of concern:

The eggs which are passed in urine, and eggs embryonate in aquatic environments, where they are ingested by an aquatic oligochaete, hatch, and develop into a larvae. A paratenic host such as a fish or frog may then ingest the oligochaete. The oligochaete or paratenic host is then eaten by a definitive mammal host, such as a wildcat. The larvae penetrates the intestinal lining and migrate to the liver. After maturing for approximately 50 days, the juveniles then migrate to the kidneys, most commonly the right kidney. Adults can survive for about 5 years

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**

The parasite is found worldwide, but is rarely reported from domestic cats in Europe, and has not been reported in European wildcats	Low

Consequences of introduction or exposure	**Mitigation possible**
In the unlikely event of an infected wildcat, it will sustain damage to one kidney, but is likely to not be majorly clinically affected as the remaining kidney will have sufficient capacity for normal total renal function	Yes
Mitigations measures	**Mitigations advised**
As the eggs and larva of this parasite are not shed in the faeces routine faecal parasitology will not detect infection. All captive cats imported from Europe should be treated with a broad-spectrum worm treatment such as fenbendazole or other, according to manufacturer's schedule for domestic cats, before entering the UK. captive wildcats should not be fed raw fish or frogs in captivity	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Hepatic capillariasis	*Capillaria hepatica*	Medium	Low

Hazard Description

Capillaria hepatica (previously *Calodium hepaticum*) is a zoonotic liver nematode of mammals. Its primary hosts are rodents, with a high prevalence of infection in the brown rat (*Rattus norvegicus*). The parasite has a direct life cycle. After the ingestion of embryonated eggs, larvae hatch in the caecum of the host and migrate via the portal venous system. After maturation in the liver parenchyma, eggs are produced approximately 28 days after mating. The adult life span has been reported to range from 18 to 60 days in mice. Eggs in the liver develop to the eight-cell stage but then develop further only once released by the death and decomposition of the host, or through excretion in the faeces of a carnivore feeding on the infected liver of the host. Eggs embryonate and become infective within five to eight weeks and can remain viable for up to three years. Despite being a zoonosis, few human cases have been reported in the UK (Pizzi *et al*., 2008). Infection has been reported occasionally in the UK in wood mice, rats, horses, dogs, and zoo primates. There is a report of two shot wild puma's being infected, with the presence of diffuse granulomas seen at post-mortem examination, with mild-to-moderate fibrosis on histopathology

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes, puma	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:

Eggs in the liver only develop once released either by excretion in the faeces of a carnivore such as a wildcat feeding on the infected liver of the host, usually a rodent, or by the death and

decomposition of an infected animal. Eggs embryonate and become infective within five to eight weeks and can remain viable for up to three years in soil. These eggs post a risk of infection to humans		
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**	
The parasite is already present in wild rodents in the UK	Medium	
Consequences of introduction or exposure		Mitigation possible
Most non-rodent cases are diagnosed incidentally at post-mortem examination and are asymptomatic. It is possible that heavy infection of an individual cat and the resultant liver fibrosis could impact its fitness and survival prospects in the wild. The main risk, although low, is to humans being infected from working around cats and their faeces and soil, particularly should rodents such as rats be present		Yes
Mitigations measures		**Mitigations advised**
As eggs are in the liver infection will not be detected on routine faecal parasitology. Kittens should be wormed at 6 weeks of age and this repeated 2-4 weeks later as a minimum. Captive wildcats should be wormed four times yearly as a routine. Wild rodents, particularly rats should be controlled around captive wildcat facilities and rodent entry to enclosures limited as far as practicably possible. Animal workers having contact with cat faeces and soil in enclosures have a risk of infection, and should always exercise appropriate hygienic precautions, such as wearing gloves when cleaning enclosures, and perform good hand washing and utensils and surface disinfection		Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Hookworm	*Ancylostoma tubaeforme and Ancylostoma spp.*	Medium	Low
Hazard Description			
Multiple hookworm species infect cats, including *Ancylostoma tubaeforme*. Adult worms are found in the small intestines and eggs are passed in the faeces, embryonating and hatching after 24–72 hours on warm, moist soil. Transmission results from ingestion of infective larvae from the environment. Larvae may also invade via the skin. Infections can be amplified if cats kept in enclosures with soil are not routinely dewormed. While *A. tubaeforme* are not avid blood feeders, and anaemia rarely develops, infections can cause hypoproteinemia and poor body condition and will affect young kittens more severely. Dermatitis can result due to larval invasion of the skin. This is a zoonotic hookworm and can cause cutaneous larva migrans in people, when larvae penetrate unprotected skin due to contaminated animal faeces in the environment. An *Ancylostoma* spp. prevalence of 32% was found in 104 wildcats in Germany (Bisterfeld *et al.,* 2024), 22% prevalence from 121 wildcat scats from Italy (Napoli *et al*., 2016), and 18% prevalence from 62 wildcat scats from Greece (Diakou *et al*., 2021)			

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:
Transmission is via ingestion of infective larvae from the environment, but larvae may also invade via the skin, before migrating through tissues to the intestinal tract

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Ancylostoma hookworms are widespread in domestic and feral cats and red foxes in the UK	Medium

Consequences of introduction or exposure	Mitigation possible
Infections can be amplified if cats kept in enclosures with soil are not routinely dewormed, and especially young kittens could be affected and loose body condition. This is a zoonotic hookworm and can cause cutaneous larva migrans in people, when larvae penetrate unprotected skin due to contaminated animal faeces in the environment	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Hookworms are normally sensitive to many commercial domestic cat worming products, but post-treatment faecal testing should be repeated to ensure efficacy. Amplification of infections should be reduced by removal of faeces in enclosures regularly. It is recommended that kittens are wormed at 6 weeks of age, and this is repeated 2-4 weeks later as a minimum. All captive cats should be dewormed quarterly. Animal workers having contact with cat faeces or soil in captive wildcat enclosures should use wear gloves when cleaning or working in enclosures	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Stomach worms	*Physaloptera spp.*	Low	Low

Hazard Description
Physaloptera are Spirurida nematodes found in carnivores, including wildcats. The parasites' developmental cycles involve insects, including beetles, cockroaches, and crickets, as intermediate hosts. Mice and frogs may be paratenic hosts. Once encysted larvae are ingested by a wildcat in an intermediate insect host or paratenic host the adult nematodes develop and then firmly attach to the wall of the stomach and duodenum, where they feed on the mucosa and suck blood. Although

infections are often subclinical, these parasites may cause gastritis that can result in vomiting, anorexia, and dark faeces. Bleeding, ulcerated areas remain on the gastric mucosa when the parasites move to other locations; in heavy infections, anaemia and weight loss may develop. A prevalence of 52 % was found in 121 wildcat scat samples from Italy (Napoli *et al*., 2016)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination

Transmission pathways of concern:
Encysted infective larvae of *Physaloptera* spp have been found in several species of insects, including beetles, cockroaches, and crickets. Mice and frogs may act as paratenic hosts. After a wildcat eats an intermediate or paratenic host, the larvae develop into adult worms, residing in the stomach. Eggs are passed in the faeces that then infect new insect intermediate hosts

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The parasite is found in the UK and is very common in free-ranging wildcats	Medium

Consequences of introduction or exposure	Mitigation possible
Most infected cats are asymptomatic, but individual wildcats or heavy infections this parasite can cause vomiting, anaemia, anorexia, and weight loss.	Yes

Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. However, this parasitic worms eggs can be missed on routine faecal parasitology flotation, as they do not readily float, and are best detected by faecal sedimentation. Treatment with pyrantel pamoate or ivermectin with repetition after 2-3 weeks is usually effective in domestic cats. It is recommended that kittens are wormed at 6 weeks of age, and this is repeated 2-4 weeks later as a minimum. All captive cats should be dewormed quarterly	Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Strongyloides	*Strongyloides felis, S. tumefaciens, S. planiceps and S. stercoralis*	High	Low

Hazard Description
Threadworms or *Strongyloides* spp. are nematode parasites of cats acquired via ingestion of infective larvae in milk or the environment, or via penetration of the skin. Cats are infected with different species according to geographical location. *S. stercoralis* is zoonotic, and larvae in fresh faeces are

infective for humans and can cause disease in immunocompromised individuals. Disease most commonly occurs in domestic cat kittens, with diarrhoea that may be mucoid, or blood streaked, malabsorption, and, to a lesser extent, bronchopneumonia, most commonly observed. Clinical signs indicate that a heavy infection has been building up for weeks. Emaciation is often prominent, and decreased growth rate may be one of the first clinical signs. A survey of 104 wildcats from Germany found a high prevalence of 59% (Bisterfeld *et al*., 2024)			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination, Carrier, Zoonotic
Transmission pathways of concern:			
The filariform larvae penetrate the skin but also may infect a host via ingestion. Trans-mammary (milk) transmission is possible in some species of Strongyloides			
Likelihood of disease introduction or release		**Likelihood of exposure to the introduced wildcats**	
Threadworms are widely occurring in domestic cats in the UK		High	
Consequences of introduction or exposure			Mitigation possible
Strongyloides stercoralis is zoonotic, and larvae in fresh faeces are infective for humans, and can penetrate skin, and can cause disease in immunocompromised individuals. *Strongyloides* spp. can cause severe disease or death in heavily infected kittens, adversely affecting a captive breeding wildcat population			Yes
Mitigations measures			**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment. Post-treatment faecal testing should be repeated to ensure efficacy. Faeces in enclosures must be removed regularly. Perinatal infection of kittens via the queen's milk can be reduced by treated adult females near the end of pregnancy. It is recommended that kittens are wormed at 6 weeks of age, and this is repeated 2-4 weeks later as a minimum. Kittens in high-risk situations can be treated from 2 weeks of age and as frequently as every 2 weeks until 12 weeks old then monthly until 6 months old, if needed. All animal workers having contact with cat faeces have a risk of occupational exposure to *S. stercoralis* and must wear gloves when cleaning.			Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Toxascaris	*Toxascaris leonina*	Medium	Low

Hazard Description			
Toxascaris leonina roundworm infection is common in domestic cats, particularly young animals. These roundworms are also zoonotic, and infections are occasionally found in people, although far less frequently than *Toxocara* species. In children infection can occasionally cause visceral larva migrans, with clinical signs being associated with the specific organs affected. In the host cat adult parasites reside in the small intestine. Most infections are asymptomatic but sometimes may result in diarrhoea with mucous or loss of body condition. Unlike *Toxocara cati* this roundworm has not been reported in wild European wildcats, although it poses a similar risk to humans as a zoonosis (Diakou *et al*., 2021; Napoli *et al.*, 2016)			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes, domestic and zoo felids	Source, Captivity, Destination, Carrier, Zoonotic
Transmission pathways of concern:			
T. leonina infections are acquired by faeco-oral contamination and the ingestion of eggs, such as grooming of the fur after contact with soil, or by the consumption of infected paratenic hosts such as rodents			
Likelihood of disease introduction or release		**Likelihood of exposure to the introduced wildcats**	
Toxascaris is already widespread in domestic and feral cats in the UK		Medium	
Consequences of introduction or exposure			Mitigation possible
Infection would mainly be of concern in kittens, causing poor growth, or as wildcats acting as a source of infection for other wildlife, or a source for zoonotic infections in people working with wildcats			Yes
Mitigations measures			**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment. Roundworms are usually sensitive to many commercial domestic cat worming products, but post-treatment faecal testing should be repeated to ensure efficacy. Reinfection can further be reduced by removal of faeces in enclosures regularly. Wild rodents should be controlled as these can act as sources of infection. Perinatal infection of kittens can be reduced by treated adult females near the end of pregnancy. It is recommended that kittens are wormed at 6 weeks of age, and this is repeated 2-4 weeks later as a minimum. Kittens in high-risk situations can be treated from 2 weeks of age and as frequently as every 2 weeks until 12 weeks old then monthly until 6 months old, if needed. All animal workers having contact with cat faeces have a risk of occupational exposure to *Toxocara* and should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection.			Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Toxocariasis	*Toxocara cati*	High	Low

Hazard Description

Toxocara spp roundworms, especially *Toxocara cati* are common parasites infecting domestic cats as well as European wildcats. The adult parasites are found in the small intestine of cats, and usually asymptomatic, but may sometimes cause diarrhoea or loss of condition. Infection is mainly of concern in kittens, and can result in poor growth, while severe infections can prove fatal. *Toxocara* are also zoonotic. Migrating *Toxocara* larva can cause pathology in cats, humans and other mammals, sometimes cause pneumonia with associated coughing and retching and aberrant migration can sometimes cause brain lesions resulting in neurological signs, or cause ocular larval migrans, causing uveitis and even blindness. A prevalence of infection of 44% was found in 121 wildcat faecal samples from Italy (Napoli *et al*., 2016) and 45% from 62 samples from wildcats in Greece (Diakou *et al*., 2021)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Yes	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:

The main method of transmission is faeco-oral. Eggs become infective in three to four weeks after being passed out in faecal matter. Grooming of the fur, contact with soil, and consuming infected prey rodents are all sources of infection. Trans-mammary (in the milk) infection can occur, but only appears to result when queens acquire an infected during the late gestation period

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Toxocara are already widespread in domestic and feral cats in the UK	High

Consequences of introduction or exposure	Mitigation possible
Infection is mainly of concern in kittens, with poor growth, or severe infections even proving fatal. Adult wildcats are mainly asymptomatic but can act as a source of infection for other wildlife such as foxes or rodents. *Toxocara* are zoonotic, and pose an important risk to wildcat carers, and pose an increased risk to children and those who are immunocompromised.	Yes

Mitigations measures	Mitigations advised
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment. Roundworms are usually sensitive to many commercial	Yes

domestic cat worming products, but post-treatment faecal testing should be repeated to ensure efficacy. Reinfection can further be reduced by removal of faeces in enclosures regularly. Wild rodents should be controlled as these can act as sources of infection. Perinatal infection of kittens can be reduced by treated adult females near the end of pregnancy. It is recommended that kittens are wormed at 6 weeks of age, and this is repeated 2-4 weeks later as a minimum. Kittens in high-risk situations can be treated from 2 weeks of age and as frequently as every 2 weeks until 12 weeks old then monthly until 6 months old, if needed. All animal workers having contact with cat faeces have a risk of occupational exposure to *Toxocara* and should exercise appropriate hygienic precautions, such as wearing gloves when handling food and cleaning, and good hand washing and utensils and surface disinfection	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Trichinosis	*Trichinella spiralis*	Low	Low

Hazard Description

Trichinella roundworm infections occur in all mammals. Adult worms live in the small intestine, but the larvae encyst in muscle and infection occurs by ingestion of these encysted larvae in raw muscle tissue by another animal. Larvae remain viable for years. Most mammals do not show any clinical signs of infection, even when harbouring high numbers of parasitic larvae per gram of muscle tissue. In experimental studies, cats have been found to be susceptible to infection by *Trichinella* spp., and while naturally occurring feline infections have been reported, clinical signs appear very rare and limited to localised granulomatous reactions to muscle cysts (Saari *et al.*, 2008). There is no treatment for infected animals. Trichinosis is a zoonotic disease of serious human health concern, but infection of humans requires eating infected meat, and the risk is almost entirely from eating raw or undercooked infected pork products

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes, domestic cats	Captivity, Destination, Carrier

Transmission pathways of concern:

Trichinella infection occurs by ingestion of larvae encysted in muscle tissue. The cyst wall is digested in the stomach. Adult worms are found in the small intestine and produce large numbers of living larvae. These larvae migrate into the lymphatics and then are carried by the circulation to striated muscles where they penetrate individual muscle cells and coil and encyst. Larvae may remain viable for years and only develop further if ingested by another host. The zoonotic risk to humans is mainly from eating raw or undercooked infected pork

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
Trichinella are already present in wild rodents and carnivores in the UK	Low

Consequences of introduction or exposure	Mitigation possible
Wildcats may be naturally infected by eating wild rodents with the infection, or via eating raw pork products. Wildcats are unlikely to be affected clinically, and there are no reports of disease in wildcats. While a zoonotic infection, wildcats pose no threat to humans if infected.	Yes
Mitigations measures	**Mitigations advised**
Rodent control and avoidance of feeding raw or undercooked pork products to captive wildcats would reduce exposure and infection of captive wildcats, however wildcats and other mammals very rarely suffer any signs and pose no zoonotic risk to humans, who are only infected by eating raw or undercooked meat of an infected animal.	No

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Troglostrongylus brevior	*Troglostrongylus brevior*	High	Low

Hazard Description

Troglostrongylus brevior is a lungworm usually infecting wild felids in Europe and is not present in the UK. This parasite has an indirect life cycle, with snails and slugs as intermediate hosts. Like most feline lungworm infections, it may be asymptomatic, or cause mild to severe respiratory signs due to bronchopneumonia, sometimes complicated by pleural effusion or pneumothorax, and cats can show nasal discharge, tachypnoea, dyspnoea and/or coughing. The disease can occasionally be fatal in kittens or immunocompromised cats. Kittens may be vertically infected and develop more severe disease. *Aelurostrongylus abstrusus* and *Troglostrongylus brevior* may cause mixed infections as they share the same intermediate and paratenic hosts, and there is a report in Greece of an ill wildcat infected with 4 different species of lungworm. A survey in Germany found a prevalence of 31% in 128 European wildcats (Bisterfeld *et al*., 2022), while a prevalence of 15% was found in 47 roadkill wildcats in Romania (Deak *et al*., 2022)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	Yes	Yes	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

Troglostrongylus brevior has an indirect life cycle involving snails and slugs. Eggs laid by female worms hatch in the respiratory tract of cats and L1 larvae are coughed up, swallowed and eliminated in the environment with the faeces. They can actively enter slugs or snails and moult into the infectious L3 stage. While slugs and snails are not usually ingested by cats, infective larvae are shed in the mucus of snails and are found in water where infected gastropods may die submerged, so drinking water can be a source of infection for cats

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Medium from imported wildcats if not screened and treated, due to its high prevalence in European wildcats	Low

Consequences of introduction or exposure	Mitigation possible
Cardio-pulmonary nematodes appear to be common parasites in European wildcats in mainland Europe but do not appear to have a serious impact on the overall health of the population. This parasite is not currently established in the UK and spillover from released wildcats originating in Europe into prey animals in the wild could establish the parasite and pose a health risk to individual domestic cats in the UK	Yes

Mitigations measures	Mitigations advised
Faecal parasitology, including both flotation and a lungworm detection technique such as Baermann faecal analysis is indicated as part of disease screening before any wildcats are imported from Europe, but all wildcats should still be treated for endoparasites, including lungworm, before import from Europe, as larvae are only shed intermittently in faeces. Sensitivity of faecal testing in enhanced if a 3-day pooled faecal sample is submitted	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Uncinaria stenocephala	*Uncinaria stenocephala*	Medium	Low

Hazard Description

The hookworm *Uncinaria stenocephala*, sometimes referred to as the Northern hookworm is found in cats, dogs and foxes in UK. A high prevalence of over 40% has been found in 588 wild red foxes in the UK (Smith *et al*., 2003) but it has a low prevalence in cats. It has not been reported in wildcats. Adult hookworms are found in the intestines. Hookworm eggs are passed in the faeces 15–20 days after infection; they complete embryonation and hatch in 24–72 hours on warm, moist soil. Transmission results from ingestion of infective larvae from the environment. Larval may also invade via the skin; however, this route appears is of little significance for U. stenocephala compared to other hookworm species, as only about 3% of infective larvae reach the small intestine to finish their lifecycle via this route. Infections can be amplified if cats kept in enclosures with soil are not routinely dewormed. While *U. stenocephala* are not avid blood feeders, infections can cause hypoproteinaemia and poor body condition and will affect young kittens more severely. Dermatitis can result due to larval invasion of the skin, particularly in the interdigital spaces (between toes). This is a zoonotic hookworm and can cause cutaneous larva migrans in people, when larvae penetrate unprotected skin due to contaminated animal faeces in the environment

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type

Yes	No	Yes, domestic cats	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:
Infection is via ingestion of infective larvae from the environment. While larvae may also invade via the skin, only about 3% of infective larvae actually reach the small intestine via this route. Infections can be amplified if cats kept in enclosures with soil are not routinely dewormed

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
This hookworm is already prevalent in the wild red fox population in the UK	Medium

Consequences of introduction or exposure	Mitigation possible
Infections can be amplified if cats kept in enclosures with soil are not routinely dewormed, and especially young kittens could be affected and loose body condition. This is a zoonotic hookworm and can cause cutaneous larva migrans in people, when larvae penetrate unprotected skin due to contaminated animal faeces in the environment	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Hookworms are normally sensitive to many commercial domestic cat worming products, but post-treatment faecal testing should be repeated to ensure efficacy. Amplification of infections should be reduced by removal of faeces in enclosures regularly. It is recommended that kittens are wormed at 6 weeks of age, and this is repeated 2-4 weeks later as a minimum. All captive cats should be dewormed quarterly. Animal workers having contact with cat faeces or soil in captive wildcat enclosures should use wear gloves when cleaning or working in enclosures.	Yes

Cestodes (Tapeworms)

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Cysticercosis	*Taenia hydatigena*	Low	Low

Hazard Description

Taenia hydatigena or the thin necked bladder worm is a tapeworm that infects the intestinal tract of carnivores such as dogs, cats, and foxes as an adult cestode. Intermediate hosts are mainly herbivores and include sheep, horses, cattle, pigs, and deer. *T. hydatigena* is an economically important livestock disease. The cysticercus, the larval form, migrates to the liver, then burrows out into the peritoneal cavity and attaches to the viscera. When the herbivore viscera are scavenged and the cat ingests the cysticercus, the protoscolex attaches to the small intestinal wall and the tapeworm begins to form proglottids. Gravid proglottids, containing the eggs, move from the end of the worm and leave the body in the faeces

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes	Source, Captivity, Destination

Transmission pathways of concern:

Transmission to herbivores such as livestock is by faeco-oral ingestion of the eggs. Infection of cats by the adult tapeworm only occurs after the cysticercus are ingested in infected viscera of an intermediate host

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The tapeworm is already present in the UK in dogs, cats and red foxes, as well as in livestock as intermediate hosts	Low

Consequences of introduction or exposure	Mitigation possible
Adult tapeworm infection is of minimal clinical significance to an individual wildcat, but an infected cat could act as an important source to impact domestic livestock and wild deer. *T. hydatigena* is an economically important livestock disease	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Most tapeworms in cats are sensitive to praziquantel treatment, but post-treatment faecal testing should be repeated to ensure efficacy. All captive cats should be dewormed quarterly with a product effective for cestodes.	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Diphyllobothriasis	*Diphyllobothrium latum*	Medium	Low

Hazard Description

Diphyllobothrium latum or the fish tapeworm can infect mammals and fish and is a zoonosis causing diphyllobothriasis in humans through consumption of raw or undercooked fish. This cestode is found in Scandinavia and parts of Eastern Europe and was found to have 5% prevalence in Lynx in Estonia (Valdmann *et al.*, 2004). Cats may be infected by consuming raw fish in areas where it occurs but cannot transmit this directly to humans. Adult tapeworms infecting mammals like cats pass immature eggs in the mammal's faeces. After being ingested by a freshwater crustacean such as a copepod, the first intermediate host, the crustacean needs to be ingested by a suitable second intermediate host, such as a freshwater fish. The plerocercoid larvae migrate to the tissues and are then infective for a definitive host, such as a cat or humans).

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
No	No	Yes, Lynx, domestic cats	Source

Transmission pathways of concern:

Transmission to cats or other mammals including humans is via the ingested of raw or undercooked infected fish in areas this cestode occurs. Cats cannot pass the infection to humans

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Highly unlikely unless untreated cats are imported from affected areas such as Scandinavia or Easter Europe	Low

Consequences of introduction or exposure	Mitigation possible
Should an imported untreated cat enter the UK this poses little threat to the individual affected cat, but could theoretically infect crustaceans and fish in a local waterway, establishing the parasite	Yes

Mitigations measures	Mitigations advised
All wildcats imported from outside the UK should have faecal parasitology screening, and any imported cats be treated with a worm medication such as praziquantel effective against cestodes within 48 hours of the import, even if clear on parasitology screening	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Echinococcosis	*Echinococcus multilocularis*	High	Low

Hazard Description			
Echinococcus multilocularis, the fox tapeworm, is a small cyclophyllid tapeworm found in Europe, but not present in the UK. Wild canids like the red fox, domestic dogs, and less commonly domestic cats and wildcats are the definitive host, with adult tapeworms found in the small intestines. Eggs shed in the faeces. In intermediate hosts, normally voles and other rodents including European beavers, *E. multilocularis* produces many small cysts throughout internal organs such as the liver. Ingestion of a rodent containing alveolar hydatid cysts by a wildcat, can result in a heavy infestation of tapeworms. *E. multilocularis* is a serious zoonosis of human health importance, as people act as accidental dead-end intermediate hosts. Human alveolar echinococcosis progresses very slowly, with a incubation period of 5 to 15 years. Progression may be more rapid in immunocompromised individuals. Following the ingestion of eggs, the larval metacestode stage of the parasite embeds in the liver, and proliferates within the tissue, acting similar to hepatic neoplasia. Patients with human alveolar echinococcosis may present with headache, nausea, vomiting, abdominal pain, hepatomegaly, and occasionally jaundice. A recent survey of 101 wild European wildcats in Germany found a prevalence of *Echinococcus multilocularis* in 18.3% of wildcat cadavers (Bisterfeld *et al*., 2024). Similarly, in France 19 intestines of domestic cats and five of European wildcats found a prevalence of 5%, in domestic cats and 20% in wildcats. It has been postulated that cats play a minor role in *E. multilocularis* transmission compared to foxes and dogs, even in highly endemic regions, but thick-shelled *E. multilocularis* eggs from cats have been reported, highlighting that infected cats still pose a zoonotic risk to people. *E. multilocularis* is not present in the UK and is a notifiable disease in the UK			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	Yes	Yes	Source
Transmission pathways of concern:			
Infection of humans is via the faecal-oral route, with eggs shed in the faeces of infected wildcats. Wildcats are infected by consuming an intermediate host rodent containing alveolar hydatid cysts.			
Likelihood of disease introduction or release		**Likelihood of exposure to the introduced wildcats**	
The importation of an infected wildcat from Europe poses the risk of this parasite being introduced and becoming established in the UK		Low	
Consequences of introduction or exposure			**Mitigation possible**
The parasite is not present in the UK, and the importation of an infected wildcat from Europe poses the risk of this parasite being introduced and becoming established in the wild rodent and carnivore populations, poses a significant risk to human health			Yes
Mitigations measures			**Mitigations advised**
All wildcats to be imported from Europe should have faecal parasitology testing and any infections including *E. multilocularis* treated and confirmed negative on repeat testing. All wildcats to be imported from Europe must also be treated with			Yes

praziquantel at the manufacturers specified dosage and protocol within 48 hours of export to prevent the risk of this parasite being introduced into the UK	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Flea tapeworm	*Dipylidium caninum*	Low	Low

Hazard Description

Dipylidium caninum the flea tapeworm is found in animals such as cats and dogs afflicted by fleas. Eggs passed in a definitive host such as a cat's faeces are ingested by flea larvae in the environment, which act as intermediate hosts and in which they develop into a cysticercoid larva. The cysticercoid larva is not infective to carnivores until the flea hatches to an adult and starts feeding. 36 hours after the flea has consumed a blood meal, the infective metacestode develops inside the flea. The metacestode larva must be ingested in a flea by a cat, dog or other carnivore during grooming to develop into the adult intestinal tapeworm. Humans can also occasionally become infected by *D. caninum* by accidentally ingesting an infected flea, something that occasionally occurs in children with pet dogs and cats that have fleas. Infection is normally asymptomatic in cats and humans, although proglottids may be seen in the faeces

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	No	Yes, domestic cats	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:

Infection is by ingestion of an infected intermediate host adult flea

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
This tapeworm is already present in the UK in domestic and wild carnivores	Medium

Consequences of introduction or exposure	**Mitigation possible**
The tapeworm is of itself of no clinical significance to an infected cat but does pose a small risk to those working with wildcats if cats are not treated regularly for fleas and parasitic worms, including cestodes	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Most tapeworms in cats are sensitive to praziquantel treatment, but post-treatment faecal testing should be repeated to ensure efficacy. All captive cats should be dewormed quarterly with a product	Yes

effective for cestodes. Adequate regular flea control both on cats and in the environment will eliminate risk to cats and humans	

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Hydatigera	*Hydatigera kamiyai*	Medium	Low

Hazard Description

Hydatigera kamiyai is a tapeworm that belongs to the genus *Hydatigera*. Previous studies have highlighted that *H. kamiyai* is distributed from Europe to western Siberia. *H. kamiyai* is a cryptic species within the *Hydatigera/Taenia taeniaeformis* complex. it is difficult to distinguish cryptic species by conventional morphological examination in the early stage. Adult parasites are found in the small intestines of felines including wildcats, which are the definitive hosts. Voles and mice are intermediate hosts and are infected when they ingest food and drink water contaminated with eggs shed in cat faeces. Infection in intermediate hosts results in fluid filled cysts in the liver and abdominal cavity. Wildcats become infected by ingesting the parasitic cysts when consuming an infected rodent. In Germany a prevalence of 85% was found in 104 wildcat samples (Bisterfeld *et al*., 2024)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination

Transmission pathways of concern:

The eggs of the adult tapeworm infecting a wildcat are shed in the faeces, and these are then consumed by rodents, which act as intermediate hosts. In rodents they eventually form fluid filled cysts in the liver and abdominal cavity. A cat becomes infected with the adult tapeworm after consuming an infected rodent with cysts

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The tapeworm is already present in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
An adult tapeworm infection is of minimal clinical significance to an individual wildcat, but an infected cat can cause infection in the local rodent population	Yes

Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Most tapeworms in cats are sensitive to praziquantel treatment, but post-treatment faecal testing should be repeated to ensure efficacy. All captive cats should be dewormed quarterly with a product effective for cestodes	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Joyeuxiella	*Joyeuxiella pasqualei*	Medium	Low

Hazard Description

Joyeuxiella pasquale is a species of cestode, infecting coprophagous beetles and reptiles as intermediate hosts with cats, dogs and other wild carnivores being the final host, where the adult worms are found in the intestine. This parasite is found in domestic cats in Southern Mediterranean Europe, but has not been reported in wildcats

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
No	No	Yes	Source

Transmission pathways of concern:

Cats can become infected by eating infected beetles or lizards in the range countries. Cats are the definitive host and will shed eggs in their faeces infecting intermediate hosts

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
This tapeworm's lifecycle is not fully elucidated and may have an unrecognised first intermediate host. There is a risk of the parasite being introduced if untreated wildcats were imported from Southern Europe	Low

Consequences of introduction or exposure	Mitigation possible
Should an imported untreated cat enter the UK, this poses little threat to the individual affected cat, but could theoretically infect intermediate hosts in the UK, establishing the parasite	Yes

Mitigations measures	Mitigations advised
All wildcats imported from outside the UK should have faecal parasitology screening, and any imported cats be treated with a worm medication such as praziquantel effective against cestodes within 48 hours of the import	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Mesocestoides	*Mesocestoides litteratus and M. vogae*	Medium	Low

Hazard Description

The life cycle of cestodes from the *Mesocestoides* genus of tapeworms is complex and requires two intermediate hosts. Cysticercoids are produced in the first intermediate host, usually oribatid mites,

which when eaten by the second intermediate host, usually rodents but also other mammalian species, birds, reptiles, or amphibians, form tetrathyridia in the body cavity. The adult tapeworm is found in the intestines of carnivores including wildcats a definitive host, and eggs are shed in the cat's faeces. In Germany a prevalence of 69% was found in 104 wildcat samples (Bisterfeld *et al*., 2024). Tapeworms of the genus *Mesocestoides* are poorly understood, due to their high morphological variability, low host specificity, and unknown details of their life cycle. They are found worldwide, with carnivorous mammals as the main definitive hosts, and the disease is potentially zoonotic. After ingestion by a definitive host, the tetrathyridium can occasionally migrate through the intestinal wall and reach the peritoneal cavity or abdominal organs causing peritoneal metacestodosis. There is a report of a case of metacestodosis of a European wildcat found dead in Croatia. This was identified as *Mesocestoides vogae*. Severe emaciation due to the severe parasitic infection and gastrointestinal bleeding was diagnosed as the likely cause of death (Sindičić *et al*., 2021)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination, Carrier, Zoonotic

Transmission pathways of concern:

The adult tapeworm is found in the intestines of wildcats and other carnivores, and eggs are shed in the cat's faeces. These eggs are consumed by oribatid mites the first intermediate host, which when eaten by a second intermediate host such as a rodent form tetrathyridia in the body cavity. A wildcat becomes infected by eating an infected intermediate host

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
The tapeworm is already present in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
A wildcat infected as the definitive host with the intestinal form of the parasite is unlikely to have any clinical effects but could act as a source of infection for local wild lagomorphs and rodents. In the rare case that a wildcat suffers from peritoneal metacestodosis, this could have a severe impact on that cat's welfare and health, causing emaciation and death	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Most tapeworms in cats are sensitive to praziquantel treatment, but post-treatment faecal testing should be repeated to ensure efficacy. All captive cats should be dewormed quarterly with a product effective for cestodes. Any ill wildcats should undergo a detailed physical examination and further testing under anaesthesia, which would help in detection in the rare case of a wildcat suffering from the non-intestinal form of the parasite.	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Rabbit tapeworm	*Taenia pisiformis*	Low	Low

Hazard Description

Taenia pisiformis, or the rabbit tapeworm, is a tapeworm which infects carnivores including cats, as the definative host. Adult *T. pisiformis* occur within the small intestines of cats. rabbits, other Lagomorphs and rodents are the intermediate hosts, in which the parasite forms cysticercus cycts on the surface of the liver, intestines and peritoneal cavity. Rabbits, hares and rodents are infected by faecal contamination of grasses and other food sources by definitive hosts such as cats. The infection in cats is asymptomatic and appears to cause no harm

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Yes	No	Yes, domestic cats	Source, Captivity, Destination, Carrier

Transmission pathways of concern:

Infection of wildcats would be by ingestion of cysts in intermediate hosts such as rabbits, hares or rodents caught as prey. Infection of rabbits and rodent is via faecal contamination of grass by an infected cat or other carnivores' faeces

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
The infection in present in wild lagomorphs and rodents	Medium

Consequences of introduction or exposure	Mitigation possible
An infected wildcat is unlikely to have any clinical effects, but an infected wildcat could act as a source of infection for local wild lagomorphs and rodents	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Most tapeworms in cats are sensitive to praziquantel treatment, but post-treatment faecal testing should be repeated to ensure efficacy. All captive cats should be dewormed quarterly with a product effective for cestodes	Yes

Infectious Disease	Agent	Risk rating	Risk after mitigation
Sparganosis	*Spirometra spp.*	Low	Low

Hazard Description			
Spirometra are pseudophyllid cestodes that have cats and canines as definitive hosts but can occasionally cause disease in humans if they are accidentally infected. The adult tapeworm lives in the small intestine of definitive hosts, including wildcats, and eggs are passed in the faeces. If these reach water, they hatch into coracidia which are eaten by copepod freshwater crustaceans. These copepods are eaten by a second intermediate host such as frogs, or other amphibians or reptiles. These again infect definitive hosts such as wildcats if eaten. Humans can become accidentally infected if eat frog legs or fish with the plerocercoid stage encysted in the muscle, and human infections are referred to as sparganosis. Very few cases have been described in humans in Europe and only a single case has been reported from a wildcat from Iran (Badri *et al*., 2017)			
Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
No	Yes	Yes, domestic cats	Source, Zoonosis
Transmission pathways of concern:			
The parasite is transmitted by ingestion of contaminated water, ingestion of a second intermediate host such as a frog or snake or contact between a second intermediate host and an open wound or mucous membrane. Cats, including wildcats and other mammals are definitive hosts, while humans are accidental hosts and only rarely infected. Copepod freshwater crustaceans are the first intermediate hosts, and amphibians and reptiles are second intermediate hosts			
Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**		
Low. The only case reported in a wildcat was in a single case in Iran. Most cases are in sub-tropical regions and human cases mainly in eastern Asia	Low		
Consequences of introduction or exposure			**Mitigation possible**
It is highly unlikely that even wildcats imported from Western European country would be infected.			Yes
Mitigations measures			**Mitigations advised**
All wildcats imported from outside the UK should have faecal parasitology screening, and any imported cats be treated with a worm medication such as praziquantel effective against cestodes within 48 hours of the import, even if clear on parasitology screening			Yes

Infectious Disease	**Agent**	**Risk rating**	**Risk after mitigation**
Taenia taeniaeformis	*Taenia taeniaeformis*	Medium	Low
Hazard Description			

Taenia taeniaeformis is a parasitic tapeworm, found in the intestines of wildcats and domestic cats, which are the primary definitive hosts. Eggs shed in cats' faeces infect rodents and occasionally lagomorphs, which are intermediate hosts. Infection in intermediate hosts results in fluid filled cysts in the liver and abdominal cavity. Wildcats become infected by ingesting the parasitic cysts when consuming an infected rodent. A prevalence of 74% was found in 23 road-killed wildcats in Greece at post-mortem examination (Diakou *et al*., 2021)

Present in UK	**Reported in Wildcats**	**Reported in other felines**	**Hazard type**
Yes	Yes	Yes	Source, Captivity, Destination

Transmission pathways of concern:

The eggs of the adult tapeworm infecting a wildcat are shed in the faeces, and these are then consumed by rodents, which act as intermediate hosts. In rodents they eventually form fluid filled cysts in the liver and abdominal cavity. A cat becomes infected with the adult tapeworm after consuming an infected rodent with cysts

Likelihood of disease introduction or release	**Likelihood of exposure to the introduced wildcats**
This tapeworm is already widespread in the UK	Medium

Consequences of introduction or exposure	**Mitigation possible**
An adult tapeworm infection is of minimal clinical significance to an individual wildcat, but an infected cat can cause infection in the local rodent population	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive cats and to direct treatment effectively. Most tapeworms in cats are sensitive to praziquantel treatment, but post-treatment faecal testing should be repeated to ensure efficacy. All captive cats should be dewormed quarterly with a product effective for cestodes	Yes

Acanthocephala (Thorny-headed worms)

Infectious Disease	Agent	Risk rating	Risk after mitigation
Acanthocephala	*Acanthocephala spp.*	Low	Low

Hazard Description

Acanthocephala spp. thorny-headed worms are occasionally found in the small intestine of wildcats. There are over a thousand species described in the phylum in a variety of mammals, birds, reptiles and amphibians. Acanthocephalans lack a mouth or alimentary canal similar to cestodes, although the two worm groups are not closely related. Adults live in the intestines of their definitive hosts, which include wildcats, and uptake nutrients which have been digested by the host, directly, through their body surface. Their life cycle is not completely known, but it is believed to include an arthropod intermediate host and paratenic hosts such as reptiles or birds. Most infections cause no clinical signs to the definitive host. The prevalence of *Acanthocephala* eggs in 121 scats from wildcats in Italy was found to be less than 1% (Napoli *et al*., 2016)

Present in UK	Reported in Wildcats	Reported in other felines	Hazard type
Possibly	Yes	Yes	Source

Transmission pathways of concern:

Acanthocephalan eggs are shed in the faeces of the definitive host. The egg, containing the acanthor, needs to be ingested by an arthropod, usually a crustacean for further development. Inside the intermediate host, the acanthor is released from the egg and develops into an acanthella. It then penetrates the gut wall, moves into the body cavity, encysts, and begins transformation into the infective cystacanth stage. This form has all the organs of the adult save the reproductive ones. The parasite is released when the first intermediate host is ingested. This can be by a suitable final host, in which case the cystacanth develops into a mature adult, or by a paratenic host, in which the parasite again forms a cyst

Likelihood of disease introduction or release	Likelihood of exposure to the introduced wildcats
Low	Low

Consequences of introduction or exposure	Mitigation possible
Acanthocephala infections are rare in wildcats, and when they occur, they do not appear to cause clinical signs in the majority of definitive hosts. While some species infect humans, cats would not pose a direct risk to humans, as both are definitive hosts	Yes
Mitigations measures	**Mitigations advised**
Regular faecal screening at least twice a year is recommended for all captive wildcats and to direct treatment effectively. Post-treatment faecal testing should be repeated to ensure efficacy, as no medications are specifically licenced as effective for *Acanthocephala* in cats. All captive cats should be dewormed quarterly as a minimum	Yes

Non-Infectious Diseases

Intoxication

Non-infectious Disease	Risk rating	Risk after mitigation
Anticoagulant rodenticides	Medium	Medium

Hazard Description

Modern anticoagulant rodenticides have a long duration of action, and present a secondary poisoning risk, accumulating in non-target species such as wildcats that may hunt affected rodents, or scavenge dead mice and rats. Anticoagulant rodenticides interfere with blood clotting in poisoned animals, which can lead to internal bleeding and death in the most severe cases. In less severe cases they can still impact an affected animals' likelihood of survival with smaller internal bleeding and can cause immunosuppression leading to secondary infection such as mange. A post-mortem study of free-living feral and Scottish wildcat hybrids (Bacon *et al*., 2023), anticoagulant rodenticide residues were detected in 61% of 49 sampled dead cats livers. In 27% of these 49 cases, the residues were above the recognised toxic threshold of 0.2 mg/kg liver for mammals. Bromadiolone and difenacoum were the most frequently detected, these appearing to be most commonly used on Scottish arable farms. Samples from lower-intensity farming areas had lower levels of anticoagulant rodenticide residues

Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Destination

Likelihood of exposure to the introduced wildcats

Medium

Consequences of introduction or exposure	Mitigation possible
There is a risk to the welfare of a single affected cat, but lack of adequate mitigations especially for the smaller initial founder wild released population could threaten the long-term viability of released wild cat populations	Yes
Mitigations measures	**Mitigations advised**
Public engagement and education of the farming community, public and other stakeholder in areas of planned wildcat releases, for judicious targeted rodent control strategies (such as bait boxes and traps rather than open application of poison) are needed, as well as release site location selection to avoid risks where heavy rodenticide use is likely such as proximity high intensity arable land farming are needed. Avoiding the feeding of rats to captive cats before release, may also encourage prey preferences once released that are less likely to be affected by rodenticides	Yes

Non-infectious Disease	Risk rating	Risk after mitigation

Botulism	Low	Low

Hazard Description
Botulism is a rapidly fatal motor paralysis caused by ingestion or in vivo production of the toxin produced by *Clostridium botulinum* types A–G. The spore-forming anaerobic organism proliferates in decomposing animal tissue and sometimes in plant material. Cats are comparatively very resistant to all types of botulinum toxin when challenged orally; however, very rare individual cases have been reported in domestic cats, lions and tigers. There are no reports in wildcats

Reported in Wildcats	**Reported in other felines**	**Hazard type**
No	Yes,	Destination

Likelihood of exposure to the introduced wildcats
Low

Consequences of introduction or exposure	**Mitigation possible**
Cases of botulism in cats are very rare, but an individual cat could be affected if eating a decomposing cadaver with high levels of toxin, which could be fatal or the affected cat	No
Mitigations measures	**Mitigations advised**
Cats are highly unlikely to be affected in captivity if fed good quality food	No

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Carbamates and organphosphates	Low	Low

Hazard Description
Carbamate and organophosphate insecticides can cause toxicity in mammals, including cats, resulting in neurological signs and death. Dichlorvos organophosphate non-prescription tick and flea collars for cats can cause skin reactions and some domestic cats have developed signs of ataxia and even death. Carbamate insecticides have been used to poison (often illegally) various wildlife species in many countries

Reported in Wildcats	**Reported in other felines**	**Hazard type**
No	Yes	Captivity, Destination

Likelihood of exposure to the introduced wildcats
Low

Consequences of introduction or exposure	**Mitigation possible**
Poisoning with these compounds can result in the death of affected wildcats	Yes

Mitigations measures	Mitigations advised
Only veterinary medicine directorate (VMD) licenced ectoparasitic treatments specifically indicated as safe for domestic cats should be used on captive wildcats, and these and any environmental sprays must be used according to the manufacturer's guidelines for cats. Public engagement and education of local communities, public, and other stakeholders, especially gamekeepers in areas of planned wildcat releases may help mitigate the risks of any malicious poisonings	Yes

Non-infectious Disease	Risk rating	Risk after mitigation
Dieldrin and other organochlorines	Low	Low

Hazard Description
These historic insecticides are now banned in most developed countries including the UK, but cats were poisoned in the past from woodworm treatments containing Dieldrin

Reported in Wildcats	Reported in other felines	Hazard type
No	Yes, domestic cats	Captivity

Likelihood of exposure to the introduced wildcats
Low

Consequences of introduction or exposure	Mitigation possible
These historic insecticides were banned in the UK, and meaningful exposure is highly unlikely	No

Mitigations measures	Mitigations advised
These historical insecticides have caused poisoning of cats in the past but are now banned in most developed countries	No

Non-infectious Disease	Risk rating	Risk after mitigation
Ethylene glycol	Low	Low

Hazard Description
Ethylene glycol toxicosis most commonly occurs when cats drink vehicle antifreeze. Despite addition of bittering agents, spilt or drained antifreeze still appears attractive to cats and other animals that may drink it. Ingestion is often fatal, with the minimum lethal dose of undiluted ethylene glycol reported as 1.4 mL/kg in cats. Domestic cats and dogs are most commonly affected, but all mammals are susceptible. The toxic effects include gastrointestinal irritation, metabolic acidosis, and neurological signs including depression, and intoxication progresses to irreversible acute kidney failure. The toxic metabolite of ethylene glycol is oxalic acid, which binds to calcium, resulting in formation of calcium oxalate crystals in the proximal renal tubules

Reported in Wildcats	Reported in other felines	Hazard type
No	Yes, domestic cats	Destination

Likelihood of exposure to the introduced wildcats
Low

Consequences of introduction or exposure	Mitigation possible
Intoxication is uncommon to rare in domestic cats living in proximity to humans and vehicles, so despite a theoretical risk to released wildcats, intoxication is highly unlikely as released wildcats should avoid humans and are unlikely to encounter vehicle antifreeze	Yes
Mitigations measures	**Mitigations advised**
Antifreeze should not be drained and any leaks cleaned if they occur in the vicinity of any wildcat captive enclosures	No

Non-infectious Disease	Risk rating	Risk after mitigation
Lead Toxicosis	Low	Low

Hazard Description
Ingestion of lead in the form of shot in scavenged or hunted shot animals can result in clinical signs such as abdominal pain, diarrhoea, and neurological signs including seizures, coma and death. Acute Lead Toxicosis via Ingestion of Spent Ammunition has been reported in a Free-Ranging Cougar (*Puma concolor*) by Butco *et al*., (2012). Green *et al*. (2024) found that 93% of pheasants destined for human consumption in England were killed using lead ammunition in the 2023/24 season, and found 87% of 121 ducks tested had been illegally shot with lead in the 2018/19 shooting season in England, nearly 20 years after restrictions on using lead shot for wildfowl, coot, moorhen, and in some wetlands, came into force. Most shot birds are not normal prey items for wildcat, but there is a risk of scavenging of birds that are not retrieved, or wounded birds that later die

Reported in Wildcats	Reported in other felines	Hazard type
No	Yes	Destination

Likelihood of exposure to the introduced wildcats
Low

Consequences of introduction or exposure	Mitigation possible
There is a risk to the welfare and survival of a single cat if affected, but it is unlikely to have an effect on the population of released wildcats	Yes
Mitigations measures	**Mitigations advised**

Public engagement and education of the local shooting and gamekeeping community, public and other stakeholder in areas of planned wildcat releases, and encouragement of the avoidance of use of lead shot, as well as aiming for better enforcement on current legislation restricting lead shot use near some wetlands and for listed species	Yes

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Metaldehyde (slug pellets)	Low	Low

Hazard Description

Metaldehyde poisoning can occur in cats after the ingestion of carelessly placed molluscicides (slug pellets). Baits are often highly palatable, resulting in non-target species intoxication. Clinical signs include neurologic dysfunction, gastrointestinal distress, hyperthermia, and cyanosis

Reported in Wildcats	**Reported in other felines**	**Hazard type**
No	Yes, domestic cats	Captivity, Destination

Likelihood of exposure to the introduced wildcats

Low

Consequences of introduction or exposure	**Mitigation possible**
The likelihood of a wildcat being exposed to metaldehyde from slug pellets is low, unless there is careless use near captive exposures, or released wildcats enter gardens where slug pellets are being used widely	Yes
Mitigations measures	**Mitigations advised**
Slug pellets should not be used in proximity to captive wildcat enclosures	Yes

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Pyrethrins and Pyrethroids	Low	Low

Hazard Description

Pyrethrin insecticides are naturally occurring compounds derived from Chrysanthemum cinerariaefolium and related species. Pyrethroid insecticides are synthetic analogues of pyrethrins, and are more stable than natural pyrethrins, and vary significantly in structure and potency. Products that contain pyrethrins and permethrin are commonly used for topical flea control on dogs and cats, however, many permethrin products are labelled for use in dogs only. Premise products and insect sprays (not intended for topical use on dogs and cats) may include pyrethrins, permethrin, and other pyrethroids as well as organophosphate or carbamate insecticides. The clinical signs of poisoning include salivation, vomiting, hyperexcitability, tremors, seizures, dyspnoea, weakness, collapse and death. Poisoning may occur due to the inappropriate use of insecticides on cats

Reported in Wildcats	Reported in other felines	Hazard type
No	Yes, domestic cats	Captivity
Likelihood of exposure to the introduced wildcats		
Low		
Consequences of introduction or exposure		**Mitigation possible**
If unlicenced insecticides are used on captive wildcats, or environmental sprays are used inappropriately wildcats may be intoxicated and if severe this may prove fatal		Yes
Mitigations measures		**Mitigations advised**
Only veterinary medicine directorate (VMD) licenced ectoparasitic treatments specifically indicated as safe for domestic cats should be used on captive wildcats, and these and any environmental sprays must be used according to the manufacturer's guidelines for cats.		Yes

Congenital / Developmental

Non-infectious Disease	Risk rating	Risk after mitigation
Heart disease	Medium	Low

Hazard Description

Hypertrophic cardiomyopathy is the most common heart disease in domestic cats, and has been shown in cats like in humans, to be heritable via an autosomal dominant trait in some breeds. In a study of 780 asymptomatic domestic cats in rehoming centres heart murmur prevalence was 41% (Payne *et al*., 2015), in which 70% of the murmurs were considered functional. The prevalence of hypertrophic cardiomyopathy was found to be 15%, and only 0.5% of cats had congenital heart disease. The positive predictive value of a heart murmur for indicating hypertrophic cardiomyopathy was 17.9-42.6% (higher in old cats), and the negative predictive value was 90.2-100% (higher in young cats). Hypertrophic cardiomyopathy has not been reported in wildcats

Reported in Wildcats	Reported in other felines	Hazard type
No	Yes, domestic cats	Source, Captivity

Likelihood of exposure to the introduced wildcats

Low

Consequences of introduction or exposure	Mitigation possible
Domestic cats have a high prevalence of asymptomatic heart disease that will progress over time to heart failure and is heritable in nature. Inadvertent inclusion of affected wildcats in captive breeding programs could include deleterious genetics in w wild release population affecting its long-term viability, and affecting the welfare and health of individual affected wildcats	Yes
Mitigations measures	**Mitigations advised**
All wildcats must undergo a comprehensive physical examination under anaesthesia before inclusion in captive breeding programs, including auscultation of the heart. Any heart murmur, or any signs suspect of heart disease must be fully investigated before affected cats are allowed to breed, and in cases of uncertainty as to heart disease individual wildcats must be excluded from breeding for release	Yes

Non-infectious Disease	Risk rating	Risk after mitigation
Idiopathic epilepsy	Low	Low

Hazard Description

Idiopathic epilepsy is the occurrence of recurrent full or partial seizures without a diagnosable cause. This may also be familial (heritable) and has been described in many species. The most common cause of epileptiform seizures in domestic cats that undergo comprehensive diagnostic investigation

is structural brain disease due to a variety of infectious or non-infectious causes (JOane et al, 1996; Quesnel et al, 1997; Drew et al, 2016)		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
No	Yes	Source, Captivity
Likelihood of disease		
Low		
Consequences of introduction or exposure		**Mitigation possible**
The risk would mainly be to an individual affected wildcat, as this may reduce its likelihood of survival after release to the wild		Yes
Mitigations measures		**Mitigations advised**
All wildcats undergo a physical examination and behavioural monitoring as part of screening for inclusion in captive breeding and for release. This should help detect any abnormalities should they be present. Any cats with neurological signs including seizures should undergo a full diagnostic investigation and if a cause for seizures cannot be determined/linked to structural brain disease, this cat and offspring should be excluded from captive breeding to reduce any risk of heritable (familial) idiopathic epilepsy in the wildcat population		Yes

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Maternal neglect	High	Low
Hazard Description		
A review of mortality findings of captive Scottish wildcats found that starvation or maternal neglect were one of the main neonatal causes of deaths with an incidence of 7% in 89 mortalities of all ages of wildcats (Ferreira *et al.,* 2024). Neonates represented 25% of all the deaths, a high percentage compared with reports in other nondomestic felid species		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Captivity, Destination
Likelihood of disease		
Medium		
Consequences of introduction or exposure		**Mitigation possible**
The risk is the release of wildcats with genetics related to poor mothering skills, with adverse effects on the released populations viability		Yes
Mitigations measures		**Mitigations advised**

Only queens with good maternal behaviours and successfully rearing kittens should be included in captive breeding for release. Queens with more than two failed litters without another identifiable or rectifiable cause should be excluded from further captive breeding and their offspring likely also not be released	Yes

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Portosystemic shunt	Low	Low

Hazard Description

Portosystemic shunts are a type of vascular abnormality that causes blood to bypass the liver before entering the circulation. The condition may be either congenital or acquired, and they result in a variety of neurological, gastrointestinal, and urinary symptoms. Congenital portosystemic shunts usually manifest with symptoms including poor growth, vomiting, ataxia, hepatic encephalopathy symptoms such as seizures, depression, tremors, drooling, and head pressing. Urate bladder stones may also form because of increased circulating uric acid excretion by the kidneys. Some shunts are heritable in some breeds and species. A review of mortality findings of captive Scottish wildcats found portosystemic shunts as a presumptive cause of death in five kittens from three litters (one died naturally, three euthanized, and one unknown) in two institutions (Ferreira *et al*., 2024)

Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Source

Likelihood of disease

Low

Consequences of introduction or exposure	**Mitigation possible**
A portosystemic shunt would impact the health and welfare of an individual captive wildcat and would likely notably affect the survivability of any inadvertently affected cat that was released. Portosystemic shunts if encountered in wildcats risk having a heritable component, and even if an individual cat was successfully treated, it should be excluded from captive breeding for release	Yes
Mitigations measures	**Mitigations advised**
All wildcats undergo a detailed physical examination under anaesthesia as well as haematology and biochemistry, as well as behavioural monitoring as part of screening for inclusion in captive breeding and for release. This should help detect any abnormalities should they be present. Any cats with neurological signs should undergo a full diagnostic investigation and if a portosystemic shunt is found, this cat and offspring should be excluded from captive breeding to reduce any risk of an adverse heritable condition persisting in the wildcat population	Yes

Degenerative

Non-infectious Disease	Risk rating	Risk after mitigation
Chronic kidney disease	Medium	Low

Hazard Description

Chronic kidney disease is a common condition affecting older domestic cats and involves a loss of functional renal tissue due to a prolonged progressive, process. Kidney disease may slowly progress without signs for years before resulting in clinical signs. It is usually irreversible and frequently progressive. The prevalence increases with advancing age, and after 5 years of age in domestic cats. The prevalence in the general domestic cat population is likely 1%–3%. Some breeds of domestic cats are associated with heritable chronic kidney disease. A review of mortality findings of captive Scottish wildcats found renal disease as a cause of death in 6% of 89 mortalities reviewed (Ferreira *et al*., 2024). Polycystic kidney disease is a heritable autosomal dominant disease of some domestic cat breeds, resulting in the progressive development of fluid-filled cysts in the kidney and sometimes in other organs as the liver and pancreas. Cysts progress and grow slowly, causing deterioration of kidney tissue and a gradual decrease in kidney function, leading to irreversible kidney failure. It has not been reported in wildcats, but if found has captive breeding implications due to it is often heritable nature

Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Source, Captivity, Destination

Likelihood of disease

Low

Consequences of introduction or exposure	Mitigation possible
Chronic kidney disease is likely to affect individual older cats and would make them unsuitable for release. Polycystic kidney disease if encountered may be heritable and could impact the viability of a captive breeding for release program if these cats are used for breeding	Yes

Mitigations measures	Mitigations advised
All wildcats undergo a physical examination and behavioural monitoring as part of screening inclusion in captive breeding and for release. This should help detect any clinically significant abnormalities including clinically significant kidney dysfunction should this be present. Any wildcats showing any signs of polycystic kidney disease should be excluded from captive breeding due to the risk of this been heritable in nature as recognised in domestic cats and other species	Yes

Non-infectious Disease	Risk rating	Risk after mitigation
Degenerative Joint Disease	Low	Low

Hazard Description		
A review of mortality findings of captive Scottish wildcats found degenerative joint disease as the cause of death or reason for euthanasia in 2% of 89 mortalities reviewed (Ferreira *et al*., 2024). Osteoarthritis is a type of degenerative joint disease resulting from the degeneration of joint cartilage and the underlying bone, caused by mechanical stress on joints and resultant low-grade inflammation. This results in joint pain and stiffness, and in some cases joint swelling or decreased range of motion also manifesting. Pain and reduced joint use may also result in muscle loss. Symptoms progress slowly over years. The risk of osteoarthritis increases with aging, but contributing causes include previous joint injuries, abnormal joint or limb development, obesity, and in some species inherited factors		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Source, Captivity, Destination
Likelihood of disease		
Low		
Consequences of introduction or exposure		**Mitigation possible**
A degree of degenerative joint disease may be expected in most long-lived captive geriatric felids and would impact the welfare and health of any affected wildcat. A wildcat inadvertently released with osteoarthritis may have reduce survivability dependant on the degree of pain and disfunction. It is expected that most wild released wildcats may not live long enough to experience notable age-related degenerative joint disease.		Yes
Mitigations measures		**Mitigations advised**
All wildcats undergo a physical examination and behavioural monitoring as part of screening inclusion in captive breeding and for release. This should help detect any clinically significant abnormalities should they be present. Wildcats found to have degenerative joint disease are unlikely to be suitable for release to the wild. Enclosure design should consider high structures that can result in repeated trauma to joints from jumping down from a height. Obesity should also be avoided in captive wildcats		Yes

Non-infectious Disease	Risk rating	Risk after mitigation
Dental disease	Medium	Low
Hazard Description		
A review of mortality findings of captive Scottish wildcats found dental disease as a cause of death or reason for euthanasia in 3% of 89 mortalities reviewed (Ferreira *et al*., 2024). Dental disease is a common and important cause of disease in captive felids. In 175 captive Amur leopards in North American facilities 19% had dental disease (Napier *et al*., 2018), and in 15 captive jaguars in Belize 51% had periodontitis and 73% of Jaguars were affected by one or more tooth fractures (Schneider *et al*., 2021). Fractured teeth and other oral pathology such as periodontitis can act as a significant		

source of pain, affecting the ability to eat and maintain body condition, or survive in the wild. Dental pain can also affect a cat's behaviour, and dental disease can cause further systemic infection further impacting survival in the wild. Loss or extraction of a number of teeth, particularly canines can seriously impact a cat's ability to hunt and catch prey in the wild		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Captivity, Destination
Likelihood of disease		
Medium		
Consequences of introduction or exposure		**Mitigation possible**
It is inevitable that some cats will fracture teeth or develop dental disease after release to the wild, irrespective of excellent dental health on pre-release screening. Immunosuppressive viral diseases may also predispose to dental pathology. Fractured teeth and other oral pathology such as periodontitis can act as a significant source of pain, affecting the ability to eat and maintain body condition, affecting a wildcat's behaviour, and impacting their ability to survive in the wild. Loss or extraction of a number of teeth, particularly canines, while reducing or eliminating pain can seriously impact a cat's ability to hunt and catch prey in the wild, or defend itself from other wildcats		Yes
Mitigations measures		**Mitigations advised**
All wildcats undergo a detailed physical examination under anaesthesia, as well as detailed dental examination, as part of screening inclusion in captive breeding and for release. As viruses such as Feline Immunodeficiency Virus and Feline Leukaemia Virus predispose cats to oral and other health problems, testing for these diseases is an essential component of health screening. Dental health should be evaluated in conjunction with the diet offered, to ensure these do not predispose to periodontitis, particularly if artificial domestic cat diets. Fractured teeth need treatment with either extraction or endodontic (root canal) treatment if the tooth is still viable. Wildcats should not be released if more than one canine is lost or extracted as they may not be able to hunt or defend themselves adequately but could remain in captivity for captive breeding		Yes

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Feline injection site sarcoma	Low	Low
Hazard Description		
Feline injection site sarcomas are malignant tumours. Differing studies have found the frequency of their occurrence in a range from less than 1 case per 10,000 vaccinated cats or as much as 1 in 1000 vaccinated cats. Feline leukaemia virus (FeLV) vaccines have been described as an inciting cause, but tumours can also occur secondary to injections of steroidal and nonsteroidal anti-inflammatories and antibiotics, and microchip implantation. Feline injection site sarcomas are highly invasive locally.		

The precise etiopathogenesis of these tumours is unknown. Any stimulus causing chronic inflammation of the subcutis can lead to neoplastic transformation		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
No	Domestic cats	Carrier
Likelihood of disease		
Low		

Consequences of introduction or exposure	**Mitigation possible**
Risk would be to the welfare and survival chances of a single affected cat. Disease would likely manifest many years later in life post release, and the small theoretical risk relays on wild released cats surviving to a sufficient age for this to be able to develop	No
Mitigations measures	**Mitigations advised**
Several risk mitigations have been suggested in domestic animals, ranging from vaccinations over limbs, to allow limb amputation should a tumour occur to reducing the frequency of vaccinations or some components to less frequently than annually. No meaningful mitigations of this small theoretical risk are recommended in wildcats	No

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Hyperthyroidism	Low	Low
Hazard Description		
While hyperthyroidism has not been described in wildcats, a prevalence of 2.4% of domestic cats (out of a population of 95 thousand cats studied in the UK) was found for Hyperthyroidism (Stephens et al, 2014). In this condition the thyroid gland produces too much thyroid hormone. Most cases of hyperthyroidism in cats are the result of benign tumours. The cause is believed to be multifactorial. Iodine levels, soya isoflavones and goitrogens in commercial cat food have been postulated by some to contribute. Hyperthyroidism progresses slowly with subtle symptoms initially. The most common symptom is weight loss. Other common symptoms include a palpable (enlarged) thyroid gland, polyphagia without obesity, tachycardia or heart murmurs, polydipsia and polyuria and vomiting		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
No	Domestic cats	Carrier
Likelihood of disease		
Low		

Consequences of introduction or exposure	**Mitigation possible**
Risk would be to the welfare and survival chances of a single affected cat if undetected	Yes

Mitigations measures	Mitigations advised
All wildcats undergo a physical examination and behavioural monitoring as part of screening inclusion in captive breeding and for release. This should help detect any clinically significant abnormalities should they be present. A comprehensive physical examination of all cats under anaesthesia during screening, and behavioural monitoring via CCTV during captivity can help detect any signs of abnormal health status that can be investigated further with specific testing for hyperthyroidism, lowering any risk	Yes

Non-infectious Disease	Risk rating	Risk after mitigation
Neoplasia	Medium	Low

Hazard Description

In a review of mortality findings of captive Scottish wildcats' neoplasia was identified as the cause of death in only 3% of Scottish wildcats, which is in contrast with higher levels reported in domestic cats and captive large wild felids, which has been reported as reaching almost 20% in some species (Ferreira *et al*., 2024). There are few published neoplasia cases in wildcats, but there are two published reports of meningioma in individual wildcats (Franzen *et al*., 2023; Drew *et al*., 2016), which is also the most frequent intracranial neoplasm in domestic cats. Feline leukaemia virus also predisposes domestic and wild feline species to the development of tumours

Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Captivity, Destination

Likelihood of disease

Medium

Consequences of introduction or exposure	Mitigation possible
It is inevitable that a small number of individual wildcats may develop tumours if they live into old age after release, which would affect an individual wildcat's health and welfare, but likely have no effect on a released population, unless linked to widespread feline leukaemia virus infections	Yes

Mitigations measures	Mitigations advised
All wildcats undergo a detailed physical examination under anaesthesia, as well as haematology and biochemistry, as part of screening inclusion in captive breeding and for release. This should help detect any subtle clinically significant abnormalities including tumours should they be present and direct their further investigation. Any unwell captive wildcats would also undergo similar examination and testing. As Feline Leukaemia Virus predisposes cats to the development of tumours and other serious health problems, testing for the disease is an essential component of health screening and any positive cats must be excluded from captive breeding facilities or release	Yes

Non-infectious Disease	Risk rating	Risk after mitigation
Feline triaditis and pancreatitis	Medium	Low

Hazard Description

Feline triaditis describes concurrent pancreatitis, cholangitis and inflammatory bowel disease. The reported prevalence is 17-39% in ill domestic cats. The aetiology is poorly understood, but is known to include infectious, autoimmune and physical components. Triaditis may be part of multiorgan inflammatory disease. Cholangitis, pancreatitis and irritable bowel disease manifest with overlapping, vague and non-specific clinical signs. A review of morbidity and mortality findings of captive Scottish wildcats found younger wildcats accounted for 85.7% of all morbidity (illness) cases, with gastrointestinal disease affecting 68% of 77 cases. Mortality was associated with disease of the gastrointestinal tract in 14% of 89 cases, and one quarter of all histopathology examinations reported gastritis, often combined with pancreatitis (Ferreira *et al*., 2024)

Reported in Wildcats	Reported in other felines	Hazard type
Yes	Yes	Source, Captivity

Likelihood of disease

Medium

Consequences of introduction or exposure	Mitigation possible
It is likely that triaditis or pancreatis would only affect an individual wildcat, requiring investigation and treatment. However, as some domestic cat breeds appear more predisposed it is possible there is heritable component and cats that have recurrent episodes of illness should be excluded from captive breeding for release to mitigate any risk	Yes
Mitigations measures	**Mitigations advised**
All wildcats undergo a detailed physical examination under anaesthesia, as well as haematology and biochemistry, as part of screening inclusion in captive breeding and for release. This should help detect any subtle clinically significant abnormalities should they be present and direct their further investigation. Any unwell captive wildcats would also undergo similar examination and testing. As certain domestic cat breeds appear more predisposed to triaditis, a heritable component is possible in wildcats, and individual cats that have recurrent episodes of illness should be excluded from captive breeding for release to mitigate any risk	Yes

Environmental

Non-infectious Disease	Risk rating	Risk after mitigation
Hybridisation	High	High

Hazard Description		
A high level of hybridisation currently occurs in the current Scottish wildcat population, linked to a high level of wild living domestic cats and significant overlap in habitat with wildcats. Scottish Wildcat Action (2023) reported that to achieve long-term changes in the feral domestic/hybrid cat population, modelling suggested that an annual neutering rate of 75% of the population was needed. The 75% annual neutering rate, based on the number of feral domestic and hybrid cats estimated from camera surveys in Scotland, was not reached. This high rate proved to be extremely difficult to attain with the resources available to the project. Identification of wildcat hybrids in the field at trapping also proved problematic. The study concluded that a high neutering rate may be achievable at local levels, for limited periods. However, at wider geographical scales, and in longer timescales, the restoration of the wildcat through the widespread use of TNVR alone is unlikely to be sustainable		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Source, Destination
Likelihood of exposure to the introduced wildcats		
High		
Consequences of introduction or exposure		**Mitigation possible**
Lack of adequate mitigations towards hybridisation, especially of the smaller initial founder wild released population could threaten the long-term viability of released wildcat populations		Yes
Mitigations measures		**Mitigations advised**
Genetic screening of all founder animals for captive breeding for release to limit any hybridisation risk from source is essential. Release site selection to limit habitat overlap between released wildcats and feral domestic cats, and control of local feral domestic cat numbers either through culling, trapping and rehoming, or trap-neuter-vaccinate-release programs. Engagement with locals and stakeholders such as cat and animal welfare organisations for support for feral cat control to limit hybridisation risks in release locations. As TNVR program findings in Scotland have shown additional options, potentially including the future use of legislation to encourage more responsible domestic cat ownership, would reducing the risk of the pet domestic cat population acting as a source for the feral domestic cat population and causing hybridisation in the long-term		Yes

Non-infectious Disease	Risk rating	Risk after mitigation
Persecution	Low	Low
Hazard Description		
Released wildcats are at risk of inadvertent shooting or trapping. In reported post-mortem examinations of 81 wild living cats (domestic cats and wildcat hybrids) by Scottish Wildcat Action (2023) lead shot was detected in the carcases of six cats, of which all but one had domestic cat pelage. However, four were found to be genetic domestic cat-wildcat hybrids. Released wildcats are		

also at risk of being trapped inadvertently during trap, neuter and release programs if put in place locally to reduce risks of hybridisation of wildcats with domestic cats		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Destination
Likelihood of exposure to the introduced wildcats		
Low		
Consequences of introduction or exposure		**Mitigation possible**
Risk would mainly be to the welfare and survival chances of a single affected cat, if mitigations to limit population impacts are in place		Yes
Mitigations measures		**Mitigations advised**
Public engagement and education of public and stakeholder in areas of planned wildcat releases, as well as release site location selection to avoid risks from game keeping; care in implementation of trapping for trap, neuter, release schemes of wild living domestic cats, and consideration of mobile linked cameras on traps used to limit risks		Yes

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Inbreeding	Medium	Low
Hazard Description		
Continued breeding of a small population of closely related animals can result in the expression of recessive deleterious genetic traits and the loss of genetic diversity in a population, leading to decreased biological fitness of a population, with adverse effects of survival and reproduction		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Source, Captivity, Destination
Likelihood of exposure to the introduced wildcats		
Medium		
Consequences of introduction or exposure		**Mitigation possible**
Lack of mitigations towards inbreeding, especially of the founder population for captive breeding could threaten the long-term viability of released wildcat populations due to lowered survival and reproductive success, or the development of other adverse traits		Yes
Mitigations measures		**Mitigations advised**
Genetic analysis of founder animals, with selection and optimisation of breeding pairings based on these findings, in captivity will help avoid inbreeding in wildcats		Yes

for release. As initial wildcat release numbers can be small, there is a further risk of inbreeding after release. Selection of which cats are to be released in which location, with modelling of what would be sufficient numbers and genetic diversity in locations can help alleviate the risk of localised wild inbreeding occurring after release	

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Road Traffic Accidents	Medium	Medium

Hazard Description

One Scottish wildcat released to the wild in the Cairngorms in 2024 (of 9 released that season) died of a road traffic collision as diagnosed on post-mortem examination. This occurred on a minor road. As 19 wildcats were released the previous 2023 season, this equates to a this equates to a 3.5% annual mortality rate (95% confidence interval of 0.1 to 18.3%, the wide interval of this statistic is due to the small study number). In a study in Germany road traffic collisions equated to a rate of 0.4 wildcat kills/km/year on a motorway, which was travelled by 10,000 vehicles/day and fenced with a regular wildlife fence. In reported post-mortem examinations of 81 wild living cats (domestic cats and wildcat hybrids) by Scottish Wildcat Action (2023) by there were abnormalities typical of collision with road traffic in at least 58% of the 81 carcases

Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Destination

Likelihood of exposure to the introduced wildcats

Medium

Consequences of introduction or exposure	**Mitigation possible**
While the risk would predominately be to the welfare of a single affected cat, numerous road traffic fatalities could threaten the viability of a small released population and its genetic composition	Yes
Mitigations measures	**Mitigations advised**
Installing wildcat fencing in wildcat core areas along motorways or major as demonstrated to reduce road traffic mortality. Along a studied motorway in Germany by 83% (Klar *et al*., 2010). The authors further recommended that fences should incorporate safe crossing structures every 1.5-2.5 km. Fencing would be very costly in the initial re-introduction phase, with the likelihood of only minor risk reduction when the population is very small and dispersed across the habitat (in contrast to Germany). Fencing is not recommended as a likely feasible initial risk reduction strategy. Other advisable mitigations would be careful release site selection, GPS radio-collaring to monitor some released cats, and post-mortem examinations of any mortalities to determine the cause of death	Yes

Non-infectious Disease	**Risk rating**	**Risk after mitigation**

Starvation	Medium	Medium
Hazard Description		
One Scottish wildcat released to the wild in the Cairngorms in 2024 (of 9 released that season) died of likely starvation as diagnosed on post-mortem examination (Saving Wildcats, 2024). As 19 wildcats were released the previous 2023 season, this equated to a 3.5% annual reintroduction mortality rate (95% confidence interval of 0.1 to 18.3%). This cat was recognised as deceased and located due to having a GPS radio collar fitted. This occurred despite utilisation of a soft-release approach to wildcat releases (holding enclosures at release site and initial supportive feeding at release sites that is gradually reduced and withdrawn), as despite leaving food, this individual did not return to the release site to utilise this. The occurrence was linked to several factors, including poor weather over the summer period that the release occurred, which may have impacted on local vole numbers		
Reported in Wildcats	**Reported in other felines**	**Hazard type**
Yes	Yes	Destination
Likelihood of exposure to the introduced wildcats		
Medium		
Consequences of introduction or exposure		**Mitigation possible**
There is a small risk of inability to cope to any one released wildcat, however failure to adequately prepare wildcats for post-release survival could risk numerous fatalities threatening the viability of a small released population and its genetic composition		Yes
Mitigations measures		**Mitigations advised**
Soft-release reintroduction is currently employed for the Scottish wildcat releases in the Cairngorms, with provision of additional supportive feeding initially. Careful release site selection based on prey availability is needed. GPS radio-collaring for monitoring will not in itself prevent starvation of released wildcats but will allow monitoring and location of any deceased wildcats to allow full post-mortem examinations to be performed and other relevant mitigations to be considered for further releases. This method allowed determination of starvation as the cause of death in one of the Scottish wildcats released in 2024. Post-mortem examinations of any mortalities to determine the cause of death and inform further release decisions is recommended		Yes

Other

Non-infectious Disease	**Risk rating**	**Risk after mitigation**
Antimicrobial resistance	Low	Low
Hazard Description		

As defined by the World Health Organisation (WHO) antimicrobial resistance is a microorganism's resistance to an antimicrobial drug that was once able to treat an infection by that microorganism. Microbes may develop resistance to multiple drugs and then are termed multidrug-resistant. Antibiotic overuse causes selection pressure which accelerates resistance development. Antibiotic resistance enables bacteria to survive antibiotic treatment, complicating infection management and treatment options. Some resistance genes can pass between different bacterial species by means of plasmids, and antibiotic-resistant bacterial infections in animals can hence also be problematic to other animal species and humans. The WHO estimates nearly 5 million annual deaths associated with resistant infections. Overuse of antibiotics can also be a problem in a long-term captive breeding facility, leading to resistance developing in the normal environmental bacterial flora, and making any subsequent bacterial infections more difficult and costly to treat

Reported in Wildcats	**Reported in other felines**	**Hazard type**
No	Yes in domestic cats	Captivity, Zoonotic

Likelihood of disease

Low

Consequences of introduction or exposure	**Mitigation possible**
Antimicrobial resistance has been found in many native UK wildlife species, and the risk from wildcats is low. The implications for individual wildcats and their health management are also low with good veterinary practices and protocols	Yes

Mitigations measures	**Mitigations advised**
Good preventative health measures to keep captive cats healthy, and biosecurity, good hygiene and the use of effective disinfectants all alleviate the need for antibiotics. In case of the illness of a captive cat, any antibiotic usage should be justified and targeted to a specific microbe isolated on laboratory culture and antibiotic sensitivity testing. Veterinary work should be in line with the British Veterinary Associations guide on the responsible use of antimicrobials, and the UK governments five-year national action plan on tackling antimicrobial resistance (https://assets.publishing.service.gov.uk/media/6261392d8fa8f523bf22ab9e/UK_AMR_5_year_national_action_plan.pdf)	Yes

Risk mitigation

Sourcing of Wildcats for Breeding and Release

As of December 2024, the Species 360's Zoological information management system (ZIMS) lists 30 institutions (zoological collections) in the UK as holding 83 Scottish wildcats *Felis silvestris grampia* (previous redundant taxonomy) consisting of 43 males and 40 females. ZIMS lists a further 41 institutions in Europe as holding 74 European wildcats *Felis silvestris silvestris* (42 males and 32 females), with one institution holding 6 animals, but the rest holding smaller numbers. A further 29 European zoos hold 60 wildcats simply listed as *Felis silvestris* (25 males and 35 females). Not all European zoos use this system, but the majority do, and this gives a reasonable indication of current holdings. Wildlife rescue and rehabilitation centres are largely not included in this database.

There are advantages and disadvantages to using captive bred and held animal as a starter population for a breed and release program for wildcats in England. Import of such animals into England from Europe is relatively straight forward and would not need any legally mandated quarantine or inspections on arrival in the country (although a project directed quarantine period of 30 days is still needed in reducing risks of infectious disease, as recommended by the IUCN).

The Balai Directive (Article 4 of Council Directive 92/65/EEC) sets out the conditions for the import and export of animals such as wildcats, between European Union member states. For wildcats captive in an approved centre under the directive for over 120 days, a rabies quarantine waiver can also be applied for so that official Animal and Plant Health Agency (APHA) quarantine and inspections are not needed.

The main disadvantages to sourcing already captive bred wildcats from Europe are the small number of source animals likely to be made available, and possible limited genetic diversity in this population. Imports would also have to be arranged with several different institutions in different countries, each requiring separate animal health certificates completed by the exporting countries official veterinarians as issued by the APHA.

Sourcing wild origin wildcats is an alternative to sourcing captive wildcats. While small numbers of wildcats may enter wildlife rescue and rehabilitation centres these individuals may be poorly suited to be used to establish a founder population. Animals are likely to have been admitted due to injury, disease, or age-related issues, or may simply be individuals failing to thrive or cope in the wild. There may be some animals that have suffered debilitating injuries making them unsuitable to return to the wild, but still reasonable for captive breeding, but there is little indication there are suitable numbers of such animals already in captivity.

Trapping of healthy wildcats is more likely to provide a reasonable founder population, but this entails additional time, costs and staffing. Trapped wildcats would then need to undergo 120 days quarantine at a Balai approved centre (such as a local or regional zoo), health screening, pelage scoring and genetic screening would need to be undertaken during the quarantine. After this quarantine the wildcats would legally be able to be imported as from any other European approved facility, and a rabies quarantine waiver can be applied for from APHA, as well as an animal health certificate for import, completed by an official veterinarian from the country of export, as issued by APHA.

The disadvantages of this method are the increased costs and logistics required for wild trapping, as well as the prolonged 120-day quarantine in a suitable and available Balai approved facility and associated costs and husbandry needs of the wildcats as they become accustomed to captivity after being free roaming. It is also uncertain if most of the trapped cats would be clear of diseases on screening, considering the ubiquity and relatively high prevalence of viral infections like Feline leukaemia virus (FeLV) and other feline viruses in European. There may be significant costs incurred for trapped wildcats that fail the criteria to join the captive program, and these cats would likely need euthanasia as they may not be deemed fit to return to the wild under the differing animal welfare legislation in some countries.

While the European wildcat is not endangered overall in Europe, it is classified as threatened in some countries and it is included in CITES Appendix II. Irrespective of the source of the animals a CITES permit from both the exporting and importing country are required.

Transport

Depending on the location that cats will travel, transport may be via road or air. If the journey is over 65km by road, rail, air or sea, and under eight hours a Transporter Authorisation Type 1 certificate will be required and if over eight hours or from an EU Member State a Type 2 certificate is required (valid for 5 years). When transporting wildcats, an animal transport certificate is required which confirms the: origin and ownership; place of departure; date and time of departure; intended place of destination; expected duration of the intended journey. This must be carried during the transport and a copy kept for at least 6 months from the date the journey ends.

Professional international animal transporters are usually familiar with legal and welfare requirements of transporting small carnivores such as wildcats between zoos, as this is regularly performed.

Transport boxes need to be escape proof and should be impervious to allow proper cleaning and disinfection, and so should be made of plastic or similar, or similar, and not wood.

The International Air Transport Association (IATA) Live Animals Regulations (LAR) are the worldwide standard for transporting live animals by commercial airlines and need to be met for transport by flight.

Balai approved premises

The Balai Directive (Article 4 of Council Directive 92/65/EEC) sets out the conditions for the import and export of animals such as wildcats, between European Union member states. Wildcats arriving into England from Europe need to enter a Balai approved premises. The wildcat breeding or release facility should be an inspected and approved facility. If this is not the case, the wildcats will still need to enter a Balai approved facility, such as a zoo or breeding centre for an initial 30 days, before permission can be sought to move wildcats to a non-approved facility. If cats needed to be moved from a non-Balai to a Balai centre they would need to undergo a strict 30 days minimum Balai quarantine. Wild-caught or free ranging wildlife brought into a Balai approved facility need to be maintained in a Balai quarantine for 120 days.

The requirements for Balai approval are rigorous, and need discussion, inspection and approval from APHA, as well as annual inspections of the premises, records, and protocols (including post-mortem examination records, disease screening, and quarantine logs).

Quarantine

While moving wildcats from Europe to the UK between Balai approved centres does not require legal APHA inspected quarantine (assuming a rabies waiver is issued by APHA for countries where rabies is present), a 30-day quarantine is still recommended by the IUCN. Despite health assessment and disease screening before transport, some health problems may be asymptomatic and not apparent on examination, or the stress of transport and new accommodation may result in symptoms manifesting. Mixing of cats should ideally not occur during this time, except for already paired individuals from before arrival. Should cats need to be paired during quarantine then the entire new group should be treated as in quarantine for 30 days from the last individual to be added, even if previous group/pair members have completed their 30-day quarantine period.

The quarantine period may need to be extended if there are any concerns about infectious disease or non-infectious medical conditions. Complete medical records of all animals should be kept, including anaesthesia and veterinary examination notes, all screening test results, and treatments administered, vaccination and deworming treatments, and any post-mortem examination reports and test findings. This data collection can help with assessment of the initial disease screening protocol and disease risk analysis and direct further changes during a project.

Specific quarantine records should include:

- Daily visual check on all animals in quarantine (and who performed this)
- Daily change of foot bath disinfectant (and who performed this)
- Last date of quarantine enclosure occupancy (including wildcat identification).
- Date of room cleansing/disinfectant and who carried out this cleansing/disinfection at the end of the quarantine and once the wildcat has left the quarantine facility.

Keeping staff responsible for the care of any wildcats in quarantine cannot, after leaving the quarantine facility, deal with any other wildcats of the same taxonomic group for the rest of that day. In a small facility with limited staff, care staff should service and clean non-quarantine wildcat enclosures first, and only service quarantine areas at the end of the day. Wildcat care staff must disinfect their boots on entry and exit using disinfectant foot dips. Those working or cleaning in quarantine enclosures must wear gloves and perform handwashing after glove removal. Any vehicles entering and exiting enclosures should have their tires sprayed on entry and exit with Defra approved disinfectant at the specified concentration for general orders.

All disinfectants and concentrations MUST be checked against the current Defra approved disinfectants list at the time of entering quarantine as this may change:
http://disinfectants.defra.gov.uk/DisinfectantsExternal/

The quarantine enclosure should be cleansed and disinfected using a Defra approved disinfectant. Floors, walls, ceilings and any remaining furniture should be scrubbed down. Where scrubbing is not

feasible due to the delicate nature of the area or equipment, it should be wiped down with a cloth dampened with disinfectant solution. Surfaces should not be rinsed until at least 30 minutes have elapsed since application. Surfaces should be allowed to air dry after rinsing. Care must be taken during the cleansing/disinfecting process to avoid the aerosolisation of any waste material. PPE (Personal Protective Equipment) as identified in any Risk Assessment for this process must be utilised. Disinfectant footbaths used at the quarantine location should be emptied, cleansed/disinfected, and rinsed 30 minutes later daily.

Any waste and soiled bedding should be retained and securely double bagged in the quarantine facility until the end of the quarantine period, by which time it may then be disposed of as would be normal. Whenever possible, equipment should remain within quarantine premises until the wildcat completes its quarantine period. If equipment (e.g. crates) needs to be removed, they need to be cleansed/disinfected, using a concentration specified for the specific disinfectant for general orders.

Biosecurity of facilities

Any people entering wildcat enclosures must disinfect their boots on entry and exit. Boots should be waterproof to allow adequate emersion in disinfectant foot dips. Boots must be cleaned physically before disinfectant dipping (using a boot brush or similar), or the disinfection will not be effective. Any persons working or cleaning in wildcat enclosures, or those handling and cleaning bedding and other equipment from enclosures must wear gloves to mitigate the risk of any zoonotic disease transmission, as well as practice handwashing after glove removal. Any vehicles entering and exiting enclosures should have their tires sprayed on entry and exit with Defra approved disinfectant at the specified concentration for general orders. All disinfectants and concentrations MUST be checked against the current Defra approved disinfectants list at the time of entering quarantine as this may change:
http://disinfectants.defra.gov.uk/DisinfectantsExternal/

All food and bedding items must be kept in a manner that prevents access by rodents or birds. Enclosure designs and food provision (such as covers) should be such as to minimise access from birds or rodents into enclosures. Water provision should also aim to minimise the ability of drinkers to be soiled by bird droppings. Adequate rodent control in proximity is needed to mitigate risks to the captive cats from infectious diseases and parasites entering. Enclosures and facility sections should Ideally have different equipment (for cleaning and handling etc) for different enclosures. If this is not possible, equipment must be disinfected between enclosures. Staff should wear a site-specific uniform and footwear when working with wildcats, and should not wear personal clothes in enclosures, nor take soiled work uniforms home or off-site. It is advisable to limit the numbers of staff working directly with wildcats, and workdays should be planned to limit any unnecessary entries and exits from enclosures. A list should be made and maintained all wildcat care staff having any cats or other animals at home or working with any other animals off-site. Ideally wildcat carers should not have cats at home. If they do, they need to provide evidence that their cats are current with annual vaccinations and quarterly deworming treatments. They must report any illness in their cats to their line management to assess the risk this may pose to the captive wildcats. There should be signage in proximity to enclosures and the captive wildcat facility to inform staff and any visitors not to feed wild birds or mammals in the vicinity of the enclosures.

Genetic selection

Genetic selection of individuals for captive breeding or release should be performed initially before progressing further interventions and disease and health screening which are more invasive (requiring examination and sampling under anaesthesia) and expensive. In Scottish wildcats, due to the high levels of hybridisation present, a combination of a pelage scoring system and genetic testing has been published (Kitchener & Senn, 2023). The genetic testing utilises 35 Single Nucleotide Polymorphism (SNP) markers, followed by the assignment of a hybrid score called "Q", which is an estimate proportion of wildcat ancestry with 0=domestic cat and 1=wildcat. In Scottish wildcats, from a genetic management standpoint, cats are considered wildcats if LBQ ≥ 0.75, i.e. "pass the genetic threshold" (Kitchener and Senn, 2023).

Aiming for the same level of wildcat ancestry is not necessarily applicable to wildcat releases in England, as the import of captive wildcats from Europe may enable a founder population for captive breeding for release with less hybridisation than is present in Scottish wildcats.

Health screening of individual wildcats

Screening must be completed with all results assessed before any movements take place, and any endoparasites should be treated and confirmed cleared before transport of wildcats to captive facilities occurs, to limit any environmental contamination. There is repetition of sections and some requirements between the different scenarios below. This is to facilitate rapid consultation of pertinent screening requirements of cats from different sources during discussions, and to help prevent confusion or omissions.

UK origin captive wildcats

This applies to:

- Any transfers between UK captive care facilities, breeding facilities, or pre-release facilities
- Any wild-to-wild translocations within the UK
- Any wildcat kittens born in UK captive facilities before any transfers, or movement to pre-release enclosures

Complete physical examination under anaesthesia:

This must include specific examination of the eyes, ears, skin, and dentition, with particular attention to the canine teeth and gums. All the long bone joints should be manipulated for normal mobility to evaluate any signs of degenerative joint disease. If there is any uncertainty, then radiographs of the limbs should be performed. The claws must be examined, as abnormal wear may be indicative of a neurological condition. The abdomen should be palpated, and any possible abnormalities investigated further with modalities such as ultrasonography and radiography considered. The heart and lungs must be auscultated with attention to the presence of any heart murmurs or abnormal heart rhythms. Should these be noted further detailed testing is likely to be needed, including chest radiography, ECG and echocardiography (which may require a specialist veterinary cardiologist for adequate assessment) to evaluate for the presence of any functional cardiac abnormalities. To ensure consistency in record keeping a clinical examination report sheet is included in the appendices.

Identification:

All cats must be identified by insertion of a radio frequency identification (RFID) transponder (microchip). The microchip must be implanted subcutaneous on the dorsal midline just cranial to the shoulder blades or scapula. This is the standard implantation site recommended by the World Small Animal Veterinary Association (WSAVA) Microchip Subcommittee for implantation sites in small (companion) animals. This may be done at the same time as anaesthesia for the full examination and health screening. Aseptic technique, as with any injection, is recommended.

Wildcats should also have full body photographs of the left and right lateral sides of the body (with the wildcat lying on its side), as well as it's dorsal and ventral whole body. Closer photographs of the face, dorsal head, neck and nape, and the base of the tail are also recommended. These photographs may be useful for the identification of wildcats from camera trap images and will allow identification when a microchip is identified with radiography as present but has failed and is no longer readable with a microchip scanner.

Sampling:

- Blood should be taken from the jugular, cephalic, saphenous or femoral veins. Blood should be taken into EDTA, Heparin and Serum (plain) tubes. Serum tubes should be allowed to clot at room temperature before being centrifuged and the serum separated for submission or storage. Two air-dried blood smear slides should be prepared.
- Rectal faeces should be taken, or failing this (the rectum being empty) as fresh a faecal sample collected as possible, as well as a rectal bacteriology swab taken.
- A conjunctival and an oropharyngeal swab should be taken for virology testing, if required by the specific diagnostic laboratory for the testing listed below. The conjunctival swab must be taken before the application of any eye lubricant during anaesthesia.
- Fur should be plucked from the base of the tail and stored (duplicate) in brown paper envelopes labelled in a sealed plastic container with silica desiccant.

Disease testing:

- Full haematology, including the examination of a blood smear for blood parasites, and serum biochemistry (comprehensive feline profile),
- Faecal parasitology, specifying both faecal flotation and sedimentation for helminth eggs and coccidia, as well as additional specific testing for:
    - *Giardia*
    - *Cryptosporidium*
    - *Tritrichomonas foetus*
- Faecal bacteriology, including specific selective bacterial culture for:
    - *Salmonella*
    - *Campylobacter*
    - *Yersinia*
- Specific disease testing (blood and virology swabs according to the individual testing laboratories specific requirements) must be performed for:
    - Feline Calicivirus
    - Feline Herpesvirus
    - Feline Leukaemia Virus (FeLV)

- Feline Infectious Peritonitis (Feline Coronavirus)
- Feline Infectious Anaemia
- Feline Immunodeficiency Virus (FIV)
- *Chlamydia felis*
- Toxoplasmosis

Wildcats screened should also have a veterinary declaration that:

- They have been in the current facility at least 24 months (or life-long if younger than this)
- The sending facility is a Balai approved centre
- There have been no notifiable disease outbreaks in the last 48 months that can affect or be carried by felids
- There has been no *Mycobacterium* spp. disease diagnosed or found in any mammals in the facility in the last 5 years

If the wildcat has not been kept in a Balai facility for 24 months, or the veterinarian of the establishment is unable to declare the facility Mycobacterium free in mammals for the last 5 years, then the wildcat must also undergo testing for Mycobacterium via both PCR and Mycobacterium culture.

Further investigation of any other clinical abnormalities found on examination should be performed, as informed by the hazards identified in this DRA.

Vaccination:
The wildcat should be up to date with its vaccination status, as would be required for a domestic cat according to the specific licenced vaccine manufacturers specifications. This must include vaccination for:

- Feline Panleucopenia/Infectious Enteritis (Feline Parvovirus, FPV)
- Feline Rhinotracheitis (Feline Herpesvirus, FHV)
- Feline Calicivirus (FCV)
- *Chlamydia felis*
- Feline Leukaemia Virus (FeLV)

Deworming prophylaxis
Any wildcats testing positive for endoparasites (helminths or coccidia) must be treated and testing repeated not earlier than 2 weeks after the completion of treatment to ensure the specific treatment protocol, dosages, and administration has been effective in clearing the parasite.

Recommended samples for storage/biobanking:
These may be helpful in case of further testing requirements, sample loss, or laboratory error, to limit the requirements for additional anaesthesia. Samples may also be used for surveillance should a new disease emerge, or for comparison of a baseline to compare later results or post-mortem finding to. Biobank samples can also be used for genetic testing.

- Blood in EDTA
- Plain serum

- Whatmann FTA card with blood (optional)
- Plucked fur in an envelope (desirable, but optional)

European origin captive born wildcats

This health screening protocol applies to imported wildcats from outside England, Wales, Scotland and Northern Ireland that meet the following criteria:

- These MUST have been captive born
- These MUST be being imported from a Balai approved establishment in accordance with the requirements of Balai Directive (Article 4 of Council Directive 92/65/EEC), and have been present in the approved facility for a minimum of 120 days before import
- Any wildcat/s NOT born in captivity, or housed in non-approved establishments, such as rescue or rehabilitation centres must be screened under the European wild caught health screening protocol and not this protocol.

Complete physical examination under anaesthesia:

This must include specific examination of the eyes, ears, skin, and dentition, with particular attention to the canine teeth and gums. All the long bone joints should be manipulated for normal mobility to evaluate any signs of degenerative joint disease. If there is any uncertainty, then radiographs of the limbs should be performed. The claws must be examined, as abnormal wear may be indicative of a neurological condition. The abdomen should be palpated, and any possible abnormalities investigated further with modalities such as ultrasonography and radiography considered. The heart and lungs must be auscultated with attention to the presence of any heart murmurs or abnormal heart rhythms. Should these be noted further detailed testing is likely to be needed, including chest radiography, ECG and echocardiography (which may require a specialist veterinary cardiologist for adequate assessment) to evaluate for the presence of any functional cardiac abnormalities. To ensure consistency in record keeping a clinical examination report sheet is included in the appendices.

Identification:

All cats must be identified by insertion of a radio frequency identification (RFID) transponder (microchip). The microchip must be implanted subcutaneous on the dorsal midline just cranial to the shoulder blades or scapula. This is the standard implantation site recommended by the World Small Animal Veterinary Association (WSAVA) Microchip Subcommittee for implantation sites in small (companion) animals. This may be done at the sme time as anaesthesia for the full examination and health screening. Aseptic technique, as with any injection, is recommended.

Wildcats should also have full body photographs of the left and right lateral sides of the body (with the wildcat lying on its side), as well as it's dorsal and ventral whole body. Closer photographs of the face, dorsal head, neck and nape, and the base of the tail are also recommended. These photographs may be useful for the identification of wildcats from camera trap images and will allow identification when a microchip is identified with radiography as present but has failed and is no longer readable with a microchip scanner.

Sampling:

- Blood should be taken from the jugular, cephalic, saphenous or femoral veins. Blood should be taken into EDTA, Heparin and Serum (plain) tubes. Serum tubes should be allowed to clot at room temperature before being centrifuged and the serum separated for submission or storage. Two air-dried blood smear slides should be prepared.
- Rectal faeces should be taken, or failing this (the rectum being empty) as fresh a faecal sample collected as possible, as well as a rectal bacteriology swab taken.
- A conjunctival and an oropharyngeal swab should be taken for virology testing, if required by the specific diagnostic laboratory for the testing listed below. The conjunctival swab must be taken before the application of any eye lubricant during anaesthesia.
- Fur should be plucked from the base of the tail and stored (duplicate) in brown paper envelopes labelled in a sealed plastic container with silica desiccant.

Disease testing:

- Full haematology, including the examination of a blood smear for blood parasites, and serum biochemistry (comprehensive feline profile),
- Faecal parasitology, specifying both faecal flotation and sedimentation for helminth eggs and coccidia must be performed, with the laboratory asked to specifically identify any possible *Echinococcus multiloccularis* eggs, as well as additional specific testing for:
    - *Giardia*
    - *Cryptosporidium*
    - *Tritrichomonas foetus*
- Faecal bacteriology, including specific selective bacterial culture for:
    - *Salmonella*
    - *Campylobacter*
    - *Yersinia*
- Faeces must also be submitted for a Mycobacterium PCR
- Specific disease testing (blood and virology swabs according to the individual testing laboratories specific requirements) must be performed for:
    - Feline Calicivirus
    - Feline Herpesvirus
    - Feline Leukaemia Virus (FeLV)
    - Feline Infectious Peritonitis (Feline Coronavirus)
    - Feline Infectious Anaemia
    - Feline Immunodeficiency Virus (FIV)
    - *Chlamydia*
    - Toxoplasmosis

Wildcats screened should also have a veterinary declaration that:

- They have been in the current facility at least 24 months (or life-long if younger than this)
- The sending facility is a Balai approved centre
- There have been no UK identified notifiable disease outbreaks in the last 48 months that can affect or be carried by felids (these may not be notifiable diseases in the European country of origin). The current list can be found at:

https://www.gov.uk/government/collections/notifiable-diseases-in-animals

- There has been no *Mycobacterium* spp. disease diagnosed or found in any mammals in the facility in the last 5 years
- The wildcats have been vaccinated as specified as below
- The wildcats have been disease and parasitology tested as specified below and found negative for the diseases tested
- The wildcats have been treated prophlactically for *Echinococcus multiloccularis* as specified 24-120 hours before import

If the veterinarian of the Balai approved establishment is unable to declare the facility Mycobacterium free in mammals for the last 5 years, then the wildcat must also undergo testing for Mycobacterium via both PCR and Mycobacterium culture.

Further investigation of any other clinical abnormalities found on examination should be performed, as informed by the hazards identified in this DRA.

Vaccination:

The wildcat must be up to date with its vaccination status, as would be required for a domestic cat according to the specific licenced vaccine manufacturers specifications. This must include vaccination for:

- Rabies
- Feline Panleucopenia/Infectious Enteritis (Feline Parvovirus, FPV)
- Feline Rhinotracheitis (Feline Herpesvirus, FHV)
- Feline Calicivirus (FCV)
- *Chlamydia felis*
- Feline Leukaemia Virus (FeLV)

Deworming prophylaxis

Any wildcats testing positive for endoparasites (helminths or coccidia) must be treated and testing repeated not earlier than 2 weeks after the completion of treatment to ensure the specific treatment protocol, dosages, and administration has been effective in clearing the parasite.

Specific *Echinococcus multiloccularis* mitigation:

Any wildcat for importation from Europe, irrespective of the faecal parasitology results (even if these are negative), must be treated for *E. multiloccularis.* Treatment must be administered by a veterinarian and be given no less than 24 hours and no more than 120 hours (5 days) before entering the United Kingdom. The treatment must be approved for use in domestic cats in the country it's being given in and must include a drug recognised as effective against the *E. multilocularis* tapeworm. These include:

- Praziquantel 5mg/kg administered once orally
- Praziquantel 8-10mg/kg administered topically

or with one of the licenced alternatives also recognised as effective against E multiloccularis, and in accordance the manufacturers directions:

- Milbemycin oxime + praziquantel administered orally

- Praziquantel + pyrantel embonate administered orally
- Eprinomectin + praziquantel + fipronil + methoprene administered topically

European wild-caught wildcats

This health screening protocol applies to any imported wildcats from outside England, Wales, Scotland and Northern Ireland that meet ANY of the following criteria:

- Have not been born in captivity, or their origin/birth is unknown
- They are not housed in a Balai approved establishment in accordance with the requirements of Balai Directive (Article 4 of Council Directive 92/65/EEC), such as rescue or rehabilitation centres, or they have only been housed in an approved facility for less than 120 days before import
- Any wildcats trapped directly from the wild, or having entered a rescue or rehabilitation centre having been living in the wild (even if previously released into the wild or translocated).

Legal importation and quarantine requirements:

There are strict legal requirements for the importation into the United Kingdom of wildcats that are not moving between Balai approved premises in Europe and the UK or have not been present in the exporting Balai approved facility for more than 120 days. Current legal guidance must always be checked as this may change, by contacting the Animal and Plant Health Agency importations team on telephone: 03000 200 301 or via email at imports@apha.gov.uk . Wild origin wildcats, such as those caught by trapping, or in a rehabilitation centre need to undergo 120 days quarantine at a Balai approved centre, such as a local or regional zoo, and health and genetic screening would best be performed early during this period, to protect the welfare of individual cats should they not meet the disease free testing requirements needed for inclusion in a program. After this quarantine the wildcats would legally be able to be imported as from any other European approved facility, and a rabies quarantine waiver could be applied for from APHA, as well as an animal health certificate for import, completed by an official veterinarian from the country of export, as issued by APHA.

Importation of wild trapped wildcats from Europe without this prior quarantine would be more difficult and costly and would need prior agreement with the Animal and Plant Health Agency importations team, and any requirements. Transport into the UK can only be performed by specific transporters authorised by the Department for Environment, Food and Rural Affairs, and wildcats would need to enter via a limited number of approved airports or ports for inspection and can only be quarantined for the 120 days rabies quarantine at limited approved sites. Some Balai approved centres may have enclosures or quarantine facilities approved for this purpose, and quarantine inspected:
https://www.gov.uk/government/publications/rabies-quarantine-authorised-premises-and-carriers
The risk to this more costly method is that full disease screening under anaesthesia would likely have to wait until the end of quarantine and animals failing screening for inclusion in a program will already have incurred high costs from trapping, transport and quarantine.

Depending on the legal requirements imposed by local authorities on the Balai approved facility quarantining the wildcats, anaesthesia for the detailed physical examination and sampling for health screening, as well as vaccinations may only be possible after wildcats have already completed their 120 days of quarantine, and wildcats out of quarantine cannot be imported for inclusion unless fully

vaccinated and all health screening results and external laboratory findings have returned and been deemed clear.

Complete physical examination under anaesthesia:
This must include specific examination of the eyes, ears, skin, and dentition, with particular attention to the canine teeth and gums. All the long bone joints should be manipulated for normal mobility to evaluate any signs of degenerative joint disease. If there is any uncertainty, then radiographs of the limbs should be performed. The claws must be examined, as abnormal wear may be indicative of a neurological condition. The abdomen should be palpated, and any possible abnormalities investigated further with modalities such as ultrasonography and radiography considered. The heart and lungs must be auscultated with attention to the presence of any heart murmurs or abnormal heart rhythms. Should these be noted further detailed testing is likely to be needed, including chest radiography, ECG and echocardiography (which may require a specialist veterinary cardiologist for adequate assessment) to evaluate for the presence of any functional cardiac abnormalities. To ensure consistency in record keeping a clinical examination report sheet is included in the appendices.

Identification:
All cats must be identified by insertion of a radio frequency identification (RFID) transponder (microchip). The microchip must be implanted subcutaneous on the dorsal midline just cranial to the shoulder blades or scapula. This is the standard implantation site recommended by the World Small Animal Veterinary Association (WSAVA) Microchip Subcommittee for implantation sites in small (companion) animals. This may be done at the same time as anaesthesia for the full examination and health screening. Aseptic technique, as with any injection, is recommended.

Wildcats should also have full body photographs of the left and right lateral sides of the body (with the wildcat lying on its side), as well as it's dorsal and ventral whole body. Closer photographs of the face, dorsal head, neck and nape, and the base of the tail are also recommended. These photographs may be useful for the identification of wildcats from camera trap images and will allow identification when a microchip is identified with radiography as present but has failed and is no longer readable with a microchip scanner.

Sampling:

- Blood should be taken from the jugular, cephalic, saphenous or femoral veins. Blood should be taken into EDTA, Heparin and Serum (plain) tubes. Serum tubes should be allowed to clot at room temperature before being centrifuged and the serum separated for submission or storage. Two air-dried blood smear slides should be prepared.
- Rectal faeces should be taken, or failing this (the rectum being empty) as fresh a faecal sample collected as possible, as well as a rectal bacteriology swab taken.
- A conjunctival and an oropharyngeal swab should be taken for virology testing, if required by the specific diagnostic laboratory for the testing listed below. The conjunctival swab must be taken before the application of any eye lubricant during anaesthesia.
- Fur should be plucked from the base of the tail and stored (duplicate) in brown paper envelopes labelled in a sealed plastic container with silica desiccant.

Disease testing:

- Full haematology, including the examination of a blood smear for blood parasites, and serum biochemistry (comprehensive feline profile),
- Faecal parasitology, specifying both faecal flotation and sedimentation for helminth eggs and coccidia must be performed, with the laboratory asked to specifically identify any possible *Echinococcus multiloccularis* eggs, as well as additional specific testing for:
    - *Giardia*
    - *Cryptosporidium*
    - *Tritrichomonas foetus*
- Faecal bacteriology, including specific selective bacterial culture for:
    - *Salmonella*
    - *Campylobacter*
    - *Yersinia*
- Faeces must also be submitted for a Mycobacterium PCR
- Specific disease testing (blood and virology swabs according to the individual testing laboratories specific requirements) must be performed for:
    - Feline Calicivirus
    - Feline Herpesvirus
    - Feline Leukaemia Virus (FeLV)
    - Feline Infectious Peritonitis (Feline Coronavirus)
    - Feline Infectious Anaemia
    - Feline Immunodeficiency Virus (FIV)
    - *Chlamydia*
    - Toxoplasmosis
    - *Mycobacterium* via both PCR and culture.

Wildcats screened should also have a veterinary declaration that:

- The wildcats have been vaccinated as specified as below
- The wildcats have been disease and parasitology tested as specified below and found negative for the diseases tested
- The wildcats have been treated prophlactically for *Echinococcus multiloccularis* as specified 24-120 hours before import

Further investigation of any other clinical abnormalities found on examination should be performed, as informed by the hazards identified in this DRA.

Vaccination:

The wildcat must be up to date with its vaccination status, as would be required for a domestic cat according to the specific licenced vaccine manufacturers specifications. This must include vaccination for:

- Rabies
- Feline Panleucopenia/Infectious Enteritis (Feline Parvovirus, FPV)
- Feline Rhinotracheitis (Feline Herpesvirus, FHV)

- Feline Calicivirus (FCV)
- *Chlamydia felis*
- Feline Leukaemia Virus (FeLV)

Deworming prophylaxis

Any wildcats testing positive for endoparasites (helminths or coccidia) must be treated and testing repeated not earlier than 2 weeks after the completion of treatment to ensure the specific treatment protocol, dosages, and administration has been effective in clearing the parasite.

Specific *Echinococcus multiloccularis* mitigation:

Any wildcat for importation from Europe, irrespective of the faecal parasitology results (even if these are negative), must be treated for *E. multiloccularis.* Treatment must be administered by a veterinarian and given on two separate occasions. The first treatment should be given not less than 2 weeks and not more than 2 months before import. A second treatment must be given no less than 24 hours and no more than 120 hours (5 days) before entering the United Kingdom. The treatment must be approved for use in domestic cats in the country it's being given in and must include a drug recognised as effective against the *E. multilocularis* tapeworm. These include:

- Praziquantel 5mg/kg administered once orally
- Praziquantel 8-10mg/kg administered topically

or with one of the licenced alternatives also recognised as effective against E multiloccularis, and in accordance the manufacturers directions:

- Milbemycin oxime + praziquantel administered orally
- Praziquantel + pyrantel embonate administered orally
- Eprinomectin + praziquantel + fipronil + methoprene administered topically

Captive preventative health program

The following protocol should be followed to ensure the ongoing health and welfare of captive wildcats used for captive breeding, and the limit the risk of disease occurrence prior to wild releases.

Vaccination:

The preventative health vaccination protocol should be based on the manufacturer of the specific vaccine's guidelines for domestic cats and kittens. As a general principle, after an initial examination, healthy wildcat kittens aged 6-8 weeks should be vaccinated and vaccination repeated 3-4 weeks later. Should there be a disease outbreak, kittens can be vaccinated as early as 6-8 weeks of age, with vaccination repeated every 2-4 weeks until 16 weeks old. Once wildcats are fully vaccinated according to the manufacturer's recommendations, wildcats in captivity should be vaccinated annually.

Wildcats should be vaccinated against:

- Feline Panleucopenia/Infectious Enteritis (Feline Parvovirus, FPV) – a *modified live vaccination should not be used in kittens less than 4 weeks old, or in pregnant queens.*
- Feline Rhinotracheitis (Feline Herpesvirus, FHV) – *wildcats that have recovered from the disease should still be vaccinated annually*

- Feline Calicivirus (FCV) - *wildcats that have recovered from the disease should still be vaccinated annually*
- *Chlamydia felis*
- Feline Leukaemia Virus (FeLV) – *previously unvaccinated and untested adult wildcats must be tested for FeLV BEFORE being vaccinated, and only antigen and provirus negative cats should be vaccinated.*
- *Bordetella vaccine is not recommended as a routine, but could be considered in the occurrence of an outbreak in a captive wildcat facility*

Ectoparasite prevention:

Fleas and other ectoparasites such as ticks can spread several diseases and can rapidly become a major health problem in a captive cat facility. Long-lasting environmental sprays last 6 months should be used to treat indoor rooms or nest boxes twice a year and need to be well aired before the wildcats return to the enclosure or nest boxes. There is a high level of resistance to many non-prescription flea treatments for cats, and there is also a risk of toxicity with some over-the-counter cat flea treatments. Depending on the specific manufacturers' instructions wildcats should be treated every 1-2 months for fleas with a prescription flea and tick treatment product, and the environment monitored to ensure treatment is efficacious.

Faecal parasitology:

Captive wildcats should have faecal parasitology consisting of at least faecal flotation for helminth eggs and coccidia every 6 months. Any wildcats testing positive for endoparasites (helminths or coccidia) must be treated and testing repeated not earlier than 2 weeks after the completion of treatment to ensure the specific treatment protocol, dosages, and administration has been effective in clearing the parasite.

Deworming:

Irrespective of routine 6-monthly parasitology testing captive wildcats should be treated with a dewormer, including treatment for tapeworms such as praziquantel every 3 months, as not all helminth infections can be detected by faecal parasitology, or eggs may be intermittently shed in the faeces.

Diagnostic investigation of ill wildcats:

In the case of any wildcats in captivity showing any clinical signs of illness a veterinarian should be consulted. If a diagnosis is not possible, then the wildcat should be anaesthetised for a clinical examination and further disease and diagnostic testing performed as clinically indicated.

Pre-release health screening

Complete physical examination under anaesthesia – any physical abnormalities detected should be investigated further as indicated or treated as required (for example fractured tooth extracted or treated).

Disease testing:

- Full haematology, including the examination of a blood smear for blood parasites, and serum biochemistry (comprehensive feline profile),

- Faecal parasitology, specifying both faecal flotation and sedimentation for helminth eggs and coccidia, as well as additional specific testing for:
    - *Giardia*
    - *Cryptosporidium*
- Faecal bacteriology, including specific selective bacterial culture for:
    - *Salmonella*
- Specific disease testing (blood and virology swabs according to the individual testing laboratories specific requirements) must be performed for:
    - Feline Calicivirus
    - Feline Herpesvirus
    - Feline Leukaemia Virus (FeLV)
    - Feline Infectious Peritonitis (Feline Coronavirus)
    - Feline Infectious Anaemia
    - Feline Immunodeficiency Virus (FIV)
    - *Chlamydia felis*
    - Toxoplasmosis

Vaccination:

The wildcat should be up to date with its vaccinations status as would be required for a domestic cat according to the specific licenced vaccine manufacturers specifications, and this includes vaccination for:

- Feline Panleucopenia/Infectious Enteritis (Feline Parvovirus, FPV)
- Feline Rhinotracheitis (Feline Herpesvirus, FHV)
- Feline Calicivirus (FCV)
- *Chlamydia felis*
- Feline Leukaemia Virus (FeLV)

Deworming prophylaxis

Any wildcats testing positive for endoparasites (helminths or coccidia) must be treated and testing repeated not earlier than 2 weeks after the completion of treatment to ensure the specific treatment protocol, dosages, and administration has been effective in clearing the parasite. Even if faecal parasitology testing is negative, wildcats must be treated with a prescription dewormer, and this must include a treatment, such as praziquantel or another compound effective for tapeworm. This is necessary as not all helminths will shed eggs in the faeces or wildcats may only shed parasitic eggs intermittently.

Recommended samples for storage/biobanking:

Archiving / biobanking of samples is recommended before release, as these can be helpful in interpreting any findings of disease that develop after release of any wildcats or can be correlated with later post-mortem examination findings in wildcats released to the wild that subsequently die.

- Blood in EDTA
- Plain serum
- Plucked fur in an envelope (recommended)

- Whatmann FTA card with blood (recommended)

Post-release health monitoring and disease risk re-evaluation

All active interventions for post-release health monitoring, such as trapping, anaesthesia, and diagnostic sampling in the field carry the risks of injuries or mortalities, as well as having adverse impacts on an individual wildcat's welfare. Interventions could also negatively impact behaviour and cause dispersion of established wildcats, adversely impacting the small initial population and its long-term viability.

Camera trap monitoring to assess body condition and behaviour, and post-mortem examinations of any released wildcats that die, appear to offer the best low-risk initial health status monitoring for the first 1-2 years during the initial phase of introductions and establishment, in order not to disrupt the fragile population. Should a specific problem occur, such as a high rate of morbidity or mortality, then targeted trapping in a release area and health screening according to the protocol for translocations inside the UK, as specified earlier, should be followed.

Any wildcats brought into captive care for treatment and rehabilitation due to being injured, ill, or orphaned should undergo the same comprehensive health screening as any wildcat does before release to the wild.

Faecal collection from free-living wildcats could be used for genetic assessment as has been described in other felid species, as well as screened for parasites, enteric bacteria and several of the other viral and bacterial agents, as specified in the pre-release health screening protocol. The main limitation to this useful modality of post-release health surveillance is the difficulty in differentiating faeces as being from a wildcat rather than a feral domestic cat and differentiation may require genetic testing and the associated cost to enable this. In occasional cases faeces may be definitively identified as belonging to a released wildcat on camera trap footage. Suspected wildcat and domestic cat faeces in a release area should be collected, and labelled with location, date and time, and then stored frozen for later analysis should this be deemed useful based on other morbidity and mortality findings, to determine the local prevalence of diseases and parasites.

Health/disease screening of domestic cats/feral cats in release area

Feral and free-ranging domestic cats do pose significant risks to reintroduced wildcats, particularly when the initial numbers of wildcats are low, with hazards ranging from hybridisation to infectious diseases, particularly the large number of feline viruses reported identified in this disease risk assessment as hazards and published in surveillance of wildcats in Scotland and in Europe.

Management of local feral and domestic cats relies on engagement with local and national stakeholders, such as cat and animal welfare charities to agree a viable and meaningful approach to managing the risks they pose to a reintroduced wildcat population. Removal of feral cats, and full vaccination and regular deworming of all domestic cats in the area would be ideal but is unlikely to be possible.

The alternative of trap-vaccinate-neuter-release programs, need data modelling to ensure sufficient numbers of cat are trapped to have a meaningful positive impact on released wildcat health and hybridisation. These programs are costly and time and staff intensive, and as modelled in Scotland have

needed very high rates. In Scotland it was reported that an annual neutering rate of 75% of the feral cat population was needed to meaningfully impact hybridisation risk. The 75% annual neutering rate, based on the number of feral domestic and hybrid cats estimated from camera surveys in Scotland, was not reached. The high rate proved to be extremely difficult to attain with the resources available to the project. Identification of wildcat hybrids in the field at trapping also proved problematic. The study concluded that a high neutering rate may be achievable at local levels, for limited periods. However, at wider geographical scales, and in longer timescales, the study concluded that the restoration of wildcat through the widespread use of TNVR alone was unlikely to be sustainable (Scottish Wildcat Action, 2023). The risks from feral cats are most important when the released wildcat population is still small. Once wildcat populations are larger and well established as in European populations the effect from feral cats on the wildcat population is lower.

Faecal collection from feral domestic cats could be used to screen for parasites, enteric bacteria and several other important viral and bacterial disease, as specified in the wildcat pre-release health screening protocol. Suspected feral cat and wildcat faeces in a release area should be opportunistically collected during field work, and labelled with location, date and time, and then stored frozen for later analysis should this be deemed useful based on other morbidity and mortality findings, to determine the local prevalence of diseases and parasites.

Post-mortem examination of feral cats in an area of wildcat releases is a potentially useful method of assessing the population health in a region. The same level of detailed examination is not needed for feral cats compared to wildcats. Carcasses of dead feral cats can be frozen, and post-mortem examination performed in-batch at a later date. Gross post-mortem examinations can also be performed by non-specialist vets in the field or at a local facility to collect samples for disease testing or storage, using the same protocol as used for wildcat release screening. A post-mortem examination record sheet is provided in the appendices. Road-traffic killed feral cats are particularly useful as they can give a more accurate prevalence of diseases in the whole local cat population, giving an idea of carrier status of diseases.

Post-mortem examination

Post-mortem examinations of wildcat mortalities both in captivity as well as after release to the wild are likely the single most important method for evaluating the hazards and their mitigation efficacy with wildcat releases to the wild. Veterinary Pathology is recognised as a specialist veterinary discipline, with suitably trained, qualified and experienced vets being given recognised specialist status by the Royal College of Veterinary Surgeons in the UK. Recognised specialist veterinary pathologists in accredited veterinary laboratories are best placed to perform detailed post-mortem examinations of deceased wildcats, rather than generalised clinical veterinarians. This also provides an assurance that there is no conflict of interest with a project and any contracted clinical veterinary surgeons, and that reports are thorough, open and unbiased. Specialist veterinary pathologists work to set comprehensive protocol, and are familiar with domestic cat examinations, which are the same as required for a wildcat.

Even when found in remote locations outside normal hours, a wildcat cadaver can be stored and transported to an accredited laboratory for examination within 48-72 hours anywhere in the UK. Cadavers can be refrigerated, to reduce autolysis, especially during warm weather. Cadavers should

however never be frozen, as this makes the cadaver unsuitable for some testing such as histopathological examination of tissues.

When a wildcat is found dead, and before approaching or handling the cadaver it is essential that the location and the position of the dead wildcat in its undisturbed surroundings is photographed and recorded. This can help the specialist veterinary pathologist interpret post-mortem findings, and is especially useful in cases where persecution, such as poisoning, is suspected. The pictures and positions of the wildcat and the surroundings may give valuable forensic insight to the contributing factors to a wildcat's death.

Conveying animals for post-mortem examination to a veterinary laboratory

This procedure should be implemented for ANY wildcat carcass found dead but is mandatory for any wildcats dying during quarantine.

- Place the carcass within a plastic bag and tie closed (cable-tie preferable).
- Take care that the outside of the bag does not become contaminated. Disinfect the outer plastic bag surface using a Defra approved disinfectant at the specified concentration
- Place the bag inside another clean bag, taking care that this does not come into contact with any surfaces or clothing in the quarantine area.
- Tie the outer bag and label it clearly with the wildcat's individual ID, date, and location.
- Fill out a laboratory post-mortem examination form
- Take the bagged carcass to a suitable fridge if available (not used for human food or drink) and arrange transport to an accredited post-mortem examination as soon as logistically possible.

To ensure consistency in record keeping a post-mortem report sheet is included in the appendices.

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Dr Pizzi is past president of the British Veterinary Zoological Society, the professional organisation for zoo, wildlife and exotic species veterinarians in the UK, as well as a past president of the Scottish British Veterinary Association (BVA) branch. He has worked with captive and free-ranging wildlife in the UK and over 40 countries internationally over the last 25 years. He was an honorary assistant professor in zoo & wildlife medicine at the University of Nottingham for 15 years, was previously head of Veterinary Pathology at the Zoological Society of London's London zoo, and was for more than a decade a specialist wildlife veterinarian at the Royal Zoological Society of Scotland, Edinburgh zoo, responsible for the health screening for the reintroduction of previously extinct Partula species snails to the wild in Polynesia, and was involved in the health strategy and testing for beaver reintroduction in Scotland during the Scottish Beaver Trial. He oversaw the veterinary care and disease risk mitigation responsibility for over 50,000 Scottish native wildlife casualties that were treated, rehabilitated and returned to the wild, over 18 years for the Scottish SPCA National wildlife centre, and oversaw risk mitigation during outbreaks of Avian influenza virus and COVID. He sits as a trustee on the council of the British and Irish Association of Zoos and Aquaria (BIAZA), and is a trustee of Chester Zoo, and is a previous trustee of the Animal Welfare Foundation. He also sits as a wildlife expert on Defra's Animal Welfare Committee and

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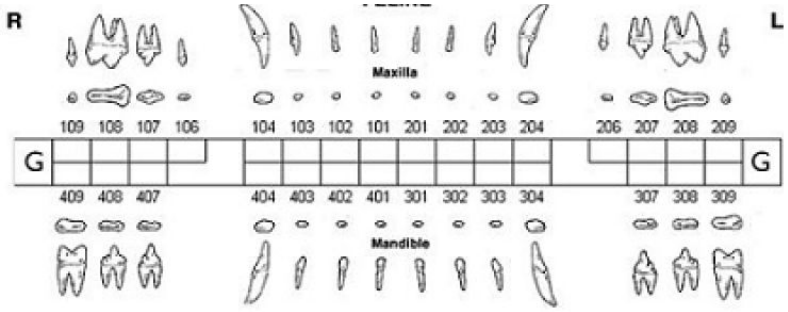
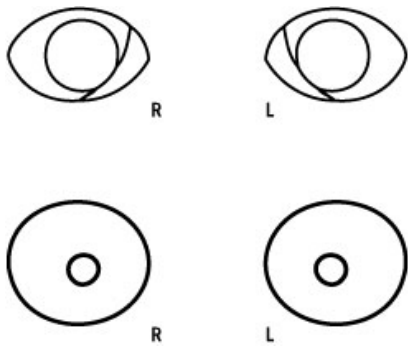
Appendices

Wildcat Clinical Examination Report

Name		ID	
Microchip		Sex	
Age (or Est)		Weight	
Clinician			
Anaesthesia notes			
Date of exam		Time of exam	
Location			
Short Medical History (if previous conditions)			

EXAMINATION	
Body condition: (*from the World Small Animal Veterinary Association*) Score 1-9 Ideal: 5	1- Ribs visible on shorthaired cats. No palpable fat. Severe abdominal tuck. Lumbar vertebrae and wings of ilia easily palpated. 2- Ribs easily visible on shorthaired cats. Lumbar vertebrae obvious. Pronounced abdominal tuck. No palpable fat. 3- Ribs easily palpable with minimal fat covering. Lumbar vertebrae obvious. Obvious waist behind ribs. Minimal abdominal fat. 4- Ribs palpable with minimal fat covering. Noticeable waist behind rib. Slight abdominal tuck. Abdominal fat pad absent 5- Well-proportioned. Observe waist behind ribs. Ribs palpable with slight fat covering. Abdominal fat pad minimal 6- Ribs palpable with slight excess fat covering. Waist and abdominal fat pad distinguishable but not obvious. Abdominal tuck absent. 7- Ribs not easily palpated with moderate fat covering. Waist poorly discernible. Obvious rounding of abdomen. Moderate abdominal fat pad. 8- Ribs not palpable with excess fat covering. Waist absent. Obvious rounding of abdomen with prominent abdominal fat pad. Fat deposits present over lumbar area. 9- Ribs not palpable under heavy fat cover. Heavy fat deposits over lumbar area, face and limbs. Distention of abdomen with no waist. Extensive abdominal fat deposits. SCORE:
Skin:	

Mouth and dentition:	
Eyes:	
Ears:	
Nose:	
Subcutaneous tissue:	
Lymph nodes:	
Limbs:	
Tail:	
Joints:	
Claws and pads:	

Cardiac auscultation:	
Heart rate (bpm):	
Respiratory auscultation:	
Respiratory rate (bpm):	
Abdominal palpation:	
External genitalia: *(note spicules on male cat's penis, and presence of both testicles in scrotum)*	
Any other findings or abnormalities:	

DIAGNOSTIC IMAGINING	
Radiography (if performed):	
Ultrasonography (if performed):	
Echocardiography (if performed):	

SAMPLES TAKEN	
Sample	Yes / No
Blood (EDTA)	
Blood (Heparin)	
Blood (Plain tube / serum)	
Blood smears	
Whatmann card blood spots	
Conjunctival swab (Virology media)	
Oropharyngeal swab (Virology media)	
Faeces	
Rectal swab	
Fur	
Urine	
Other (specify):	

NOTES

Wildcat Post-Mortem Examination Report

Name		Species	
Microchip		Sex	
Age (or Est)		Weight	
Prosector			
Links			

History Details

Date of Death		Time of Death	
Discovered by		Time of PM	
Euthanasia/died		Time difference	
Location of death			
Short Medical History			

GROSS FINDING

MEASUREMENTS:

EXTERNAL EXAMINATION	
Initial (body condition, etc)	
Skin:	
Mouth:	
Oral cavity:	
Ears:	
Nose:	

Subcutaneous tissue:	
Thyroid	
Axillar lymph nodes:	

INTERNAL EXAMINATION	
Abdomen	
General comment at opening	
Esophagus	
Stomach:	
Intestines:	
Liver:	
Pancreas:	
Spleen:	
Abdominal lymph node:	
Miscellaneous:	
Urinary tract	
Kidney:	
Ureter:	
Bladder:	

Miscellaneous:	
Reproductive tract	
Uterus	
Ovaries / testis	
Thorax	
General comment on opening:	
Respiratory system	
Lungs:	
Mediastinum:	
Trachea:	
Larynx:	
Nasal cavity:	
Thymus:	
Thoracic lymphatic node:	
Cardiovascular system	
Pericardium:	
Heart:	
Great vessels:	
Limbs	
Muscles	

Bone	
Joints	
Skull	
General comment	
Brain	
Meninges	
Miscellaneous	

Provisional Diagnosis:

Comments:

Body Storage or Disposal:

Samples Taken:

Organ	Formalin	Fresh	Frozen
Liver			
Spleen			
Kidney			
Intestine			
Pancreas			
Lung			
Heart			
Lymph nodes (specify):			
Fluid (specify):			
Brain			
Faeces			
Any other lesions (specify):			

Archived Samples:

Sample	Yes / No
Blood (Frozen)	
Whatmann card blood spots	
Fur	
Faeces	
Other samples (specify):	

Diagnostic testing requested:

NOTES: