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Rabies control strategy for Great Britain

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Rabies Control Strategy for Great Britain

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Part One – Introduction

1.1 Purpose of document

Protecting the environment, society and the economy from the risks of animal disease is a priority for government. This document sets out a framework for how an outbreak of rabies in Great Britain (GB) would be managed. Arrangements for managing a rabies outbreak in Northern Ireland is covered by a [separate document](#).

It covers general control principles for the most likely scenarios for cases of **classical rabies** virus and the rationale for such controls. It is not intended to provide detailed operational instructions for how to deal with an outbreak. Defra's [Contingency Plan for Exotic Notifiable Diseases of Animals in England](#), the Scottish Government's [Exotic diseases of animals: contingency framework plan](#) and the Welsh Government's [Contingency Plan for Exotic Animal Diseases](#) cover these arrangements and should be referred to for detailed explanation of the systems, structures, roles and responsibilities implemented during an outbreak which are referenced in this control strategy.

By describing this framework all parties affected during an outbreak of rabies will be better placed to respond quickly and effectively to control the outbreak in order to protect public health, regain our disease-free status as quickly as possible and to minimise the wider impact on the public and the natural environment. If an outbreak occurs evidence and analysis from a number of sources (including veterinary, scientific and economic) will be used to assess the effectiveness of different control options. This strategy should enable affected parties to prepare to mitigate the likely impact of these control measures during a rabies outbreak.

1.2 Approach and strategic fit

The plan covers control of rabies in animals. For information and advice on potential cases of rabies in humans the Department of Health has issued guidance which is contained within its [Memorandum on Rabies - Prevention and Control](#).

This GB-wide control strategy is endorsed by the Department for Environment, Food and Rural Affairs (Defra), the Scottish Government and the Welsh Government. This control strategy is consistent with the following:

- The general animal health and welfare policy principle that 'prevention is better than cure'.
- Ongoing obligations for the welfare of animals.
- Government's wildlife management policies.
- Government's exotic notifiable disease contingency plans.

1.3 The disease

Rabies is an invariably fatal disease to which all mammals are potentially susceptible, including humans, if no treatment is received. The characteristics of the disease vary greatly in animals and a definitive diagnosis can only be made by laboratory testing of brain tissue following post mortem. Incubation of the infection after exposure is often prolonged and variable, causing problems both in predicting disease spread and in proving disease freedom.

In humans, there is no treatment for rabies once clinical signs appear and so prevention of infection is vital. The British Isles (GB and Ireland) have been rabies free since the disease was eradicated in terrestrial animals in 1922. Thus, the risk of a human case of rabies in this country is assessed currently as 'very low'. If an incident or outbreak of rabies were to occur, rapid public health measures would be required to mitigate the health risks.

Pre-exposure prophylaxis vaccination provides safe and effective protection for humans and animals (including companion animals and wildlife). Post exposure treatment is effective in preventing the disease developing in humans providing it is administered promptly after a person has been exposed to infection and before clinical symptoms develop.

Information on the disease is readily available from many sources:

- [Defra: animal diseases](#)
- [World Organisation for Animal Health](#)
- [World Health Organisation](#)
- [Public Health England](#)
- [National Health Service](#)
- [Health Protection Scotland](#)
- [Public Health Wales](#)

Part Two – Background to the disease

2.1 The virus

Rabies is a progressive encephalomyelitis caused by neurotropic viruses of the genome *Lyssavirus*. Rabies virus is the type species and is responsible for most cases in humans and animals. Fatal cases of encephalitis caused by lyssavirus species other than human rabies virus are indistinguishable in presentation, but extremely rare.

There are currently sixteen classified species of lyssavirus. Full details of each can be found on the [International Convention on taxonomy of viruses](#) and [Rabies Bulletin Europe](#) websites.

This strategy focuses on the classical rabies virus (sometimes referred to as ‘terrestrial’ rabies), as the most prevalent species. The control of bat lyssaviruses is subject to separate measures. This is explored in more detail in Annex I.

2.2 Transmission

The virus is usually transmitted through the blood or saliva of an infected animal, normally via a bite or scratch. Less often, it can be transmitted through an open wound or a mucous membrane such as those in the mouth, nasal cavity or eyes. Person to person transmission does not generally occur though there are rare reports of transmission by other routes, such as after transplantation of organs from infected individuals. Aerosol transmission has been documented in special circumstances, such as in laboratories and caves with an extremely high bat density (although the latter do not exist in this country).

Though most animals are susceptible to rabies infection, many are considered ‘dead end’ hosts who will be unlikely to transmit the infection. Such ‘dead end’ hosts include humans and most herbivores e.g. cattle, sheep, goats and horses.

2.3 Incubation

Incubation of the disease in animals: The incubation period can vary considerably but for dogs and cats it is generally considered to be between two and twelve weeks post-infection though longer incubation periods have been reported. The location of the bite can influence incubation periods i.e. a bite to a limb would not take effect as quickly as a bite nearer the head.

Incubation of the disease in humans: In human cases, the incubation period is typically three to twelve weeks, but may vary from less than a week to more than a year.

2.4 Clinical signs

Clinical signs in animals: Rabies cannot be definitively diagnosed on clinical signs alone and must be confirmed in the laboratory. In animals, clinical signs vary considerably, though typically include sudden behavioural changes and progressive paralysis leading to death. In some cases, however, an animal may die rapidly without demonstrating significant clinical signs. Animals often exhibit one of the two following forms of rabies:

- **Furious rabies:** Animals may be anxious and/or aggressive, losing their natural fear of other animals and humans. They may demonstrate sudden behaviour changes and attack without provocation. Muscular weakness and seizures are common. Death results from progressive paralysis.
- **Dumb/Paralytic rabies:** Animals may be depressed or unusually docile, sometimes paralysed in the face, throat and neck, causing abnormal facial expressions, drooling and inability to swallow. The paralysis progresses rapidly to the whole body with subsequent coma and death.

Vaccination of animals: Vaccinations for domestic animals are safe and effective and are normally administered by injection. Oral vaccines are widely used to eradicate the disease in wildlife.

Clinical signs in humans: The first symptoms are likely to be non-specific e.g. headaches, muscular pain, nausea or coughing. The most suggestive early sign of impending rabies is numbness and/or tingling and twitching at the site of the original bite. This is likely to be followed by a phase of agitation and confusion, followed by coma, respiratory failure and death.

2.5 Treatment/disease risk mitigation in humans

Once symptoms have begun the disease is invariably fatal so immediate and appropriate wound cleansing and prompt risk assessment after a biting incident or other exposure to rabies is vital. A risk assessment will allow appropriate post exposure treatment to be administered. Recommendations on post-exposure treatment can be found in the Public Health England (PHE) [Green Book](#) (Immunisation against infectious disease).

Initial response to a bite: The rabies virus is inactivated rapidly by heat, liquid solvents and disinfectants, including warm soapy water and basic detergents. Swift and thorough cleansing of the entry site with these is an effective first measure to reduce the risk of blood or saliva contamination of the wound and therefore infection.

Vaccination: There are vaccines available for human use as well as for use in animal populations. Modern rabies vaccinations are developed using killed Rabies Virus and therefore offer a safe and very high level of pre-exposure protection against classical rabies virus and other serologically related species types including European Bat

Lyssaviruses Type 1 and 2, Bokeloh Bat Lyssavirus (BBLV), Duvenhage Virus and Australian Bat Lyssavirus when given pre-exposure. No protection is offered against some of the serologically distant lyssaviruses (Lleida Bat Lyssavirus (LBLV) and West Caucasian Bat Lyssavirus) but exposure to such species are extremely rare. Rabies immunoglobulin (passive immunisation) may be given as a post exposure treatment to prevent the development of the disease in patients who have not been previously vaccinated.

2.6 Confirming disease

Rabies can only be confirmed by laboratory testing on the affected animal's brain after death. Initial test results can usually be delivered within a few hours. Slower laboratory tests taking around two to three days will also be used to confirm earlier results and identify different serotypes the source of infection. Further information on testing can be found in section 4.7.

2.7 Current disease distribution

GB is currently free of classical rabies as are a number of other countries including many in the European Union (EU). In GB, the bat lyssavirus strain EBLV Type 2 (EBLV-2) has been detected at a low prevalence in one species of bat (Daubenton's bat). In 2018, for the first time EBLV Type 1 virus (EBLV-1) was isolated in UK resident Serotine bats. The occurrence of bat lyssaviruses in GB does not affect our disease-free status, as this is based upon freedom from classical rabies.

Rabies is [widely distributed](#) across the globe, present on all continents and endemic in most African and Asian countries. An estimated 59,000 people die of rabies each year with about 95% of human deaths occurring in Asia and Africa.

PHE and Health Protection Scotland (HPS) have published on their websites an [assessment](#) on the level of rabies risk by country.

2.8 Risk of introduction

Our island status makes it unlikely that classical rabies will be introduced through natural wildlife spread. There are strict legal controls on the entry of animals into GB aimed at preventing the introduction of rabies. Pet cats, dogs and ferrets entering GB are subject to rules relating to the movement (commercial and non-commercial) of pets. Consequently, the highest risk of rabies entering GB would be through an infected animal illegally imported into the country. Further information on [pet travel rules](#) can be found on [.GOV.UK](#).

Experts have assessed that by far the most likely scenario GB might face is that of a single pet incubating rabies (re) entering the country from abroad without meeting all legal border controls, and subsequently is diagnosed as having rabies. This would be the initial source

of the infection. In the last 18 years, all cases of rabies brought into Europe were by illegal pet movements. In all cases the index case was identified before infection became established in the wider pet or wildlife population. The less likely scenarios are where the index case is not identified and the infection has already spread into local wildlife or resident pet animals before the authorities are notified.

2.9 Risk of disease spread

The Urban Cycle: In countries where rabies is enzootic, the urban cycle, in which dogs are the main reservoir for rabies infection, is a particular danger to human health because of the close contact between dogs and humans. Globally, 99% of human deaths from rabies are associated with dog bites. This cycle is maintained when the proportion of unvaccinated and stray dogs is high. Urban rabies has been virtually eliminated in Europe.

GB does not have the high levels of stray animals required to maintain this cycle but the low levels of dogs vaccinated against infection would have to be quickly addressed in the event of an outbreak that could not be contained.

The Sylvatic Cycle: The sylvatic (or wildlife) cycle is still present in various areas of Europe where rabies is endemic in one or more wildlife species, mainly foxes. GB's large fox population and large number of urban foxes would therefore be of concern in an outbreak. Badgers have not been a significant host in European epidemics.

If rabies enters the wildlife population, it may be initially undetected, allowing infection to become established more widely before it is noticed. Human contact with wild animals, though rarer, still occurs and there is also the possibility of 'spill over' infections into the domestic animal populations, once again, putting human health at risk.

Bat Lyssaviruses: The disease caused by bat lyssaviruses is clinically indistinguishable from rabies. EBLV-2 has, very occasionally, been confirmed in Daubenton's bats resident in GB along with the first confirmed cases of EBLV-1 virus isolated from Serotine bats. However, the small likelihood of contact between people and bats (apart from bat handlers) means the human risk from this disease remains 'very low'. There are no known incidences of bat lyssaviruses becoming established in other, more risk-associated animal populations in Europe. Further information on this and other bat lyssavirus related issues can be found in Annex I.

Part Three – Management of an outbreak

3.1 Legislative powers for controlling outbreaks

Powers for controlling a rabies outbreak are primarily set out in the Rabies (Control) Order 1974 (RCO), which can be used for declaring infected places and areas. This legislation allows for a number of measures to be applied within the declared place or area including movement and behaviour restrictions (such as requiring muzzles on dogs in public places) and compulsory vaccination of domestic animals. It allows for an infected area to be divided into zones permitting different measures in different places. There are also powers available for the culling of foxes should that be necessary in an infected area.

Other powers available in support of the RCO include The Animal Health Act 1981, which contains provision for introducing government funded vaccination programmes and for the destruction of animals other than foxes. The Zoonoses Order 1989 provides powers to enter a premises and take an animal for the purpose of testing.

The Movement of Animals (Restriction) (England) Order 2002 (and parallel legislation in Scotland and Wales) allow a Veterinary Inspector (VI) who suspects disease to impose restrictions or requirements to prevent the spread of the disease including putting in place biosecurity measures and the setting up of temporary control zones to control animal movements.

Legislation to control rabies in GB was made at the domestic level. This means that the UK's withdrawal from the EU will not have a direct effect on this legislation. However, other legislation associated with the control of rabies, such as that covering pet travel and rabies serological testing, is underpinned at EU level and will be replaced by domestic equivalents.

3.2 Compensation

The Rabies (Compensation) Order 1976 fixes the amount payable in respect of animals euthanased compulsorily under the RCO. This is set down in the legislation as 100% of market value if found to be healthy at the time of euthanasia and 50% if found to have been infected with the rabies virus.

Compensation is only payable in cases where compulsory euthanasia has been directed by order of the minister. It is not payable in cases where the animal's owner has agreed to euthanasia voluntarily.

The legislation does not provide guidance on how to determine the market value for an animal euthanased compulsorily. In cases where the parties concerned cannot reach an agreement on value, then a suitably qualified and affiliated professional valuer could be provided by APHA via its Animal Health and Technical Support Services framework.

3.3 Roles and responsibilities

Defra and the devolved governments will provide strategic leadership during an outbreak through the establishment of a number of structures to coordinate and support the disease control response. Strategic decisions will be taken by the relevant minister or Chief Veterinary Officer (CVO), delegated as appropriate. Their decisions will be based on advice from experts, veterinarians, policy, economists and delivery agents. As necessary, key GB-wide policies will be submitted to the Animal Disease Policy Group (ADPG) for approval.

ADPG is the key strategic policy forum for GB-wide animal health and welfare issues. It takes expert advice from the National Experts Group (NEG), reaches official-level agreement on UK and GB control strategies and, where appropriate, makes recommendations on major policy issues for submission to ministers. ADPG includes representatives of the devolved governments to ensure that their policy positions are taken into consideration and fully understood, and to facilitate a co-ordinated approach to GB/UK disease control.

The Great Britain Exotic Disease Core Group for Rabies (GB Rabies Core Group) was formed in 2014. The role of this group is to consider, give advice and, in conjunction with officials, develop policy recommendations in relation to rabies. The GB Rabies Core Group comprises stakeholders with expertise in companion animal welfare, bat conservation and the veterinary profession. Also, from a wider government perspective, the GB Rabies Core Group has representation covering the areas of public health and local authority (enforcement of disease control). The GB Rabies Core Group would have a key advisory role to play in the event of an outbreak.

At a strategic level, the National Disease Control Centre (NDCC) brings together policy functions provided by Defra with the tactical/operational functions provided by APHA and other partners. The main responsibilities are:

Policy teams:

- To develop, determine and interpret policy within the legislative and wider strategic framework.
- To advise ministers and other strategic decision makers.
- To work in partnership with stakeholders.

Operations team:

- To engage with teams across the Central Disease Control Centre and Forward Operating Base (FOB) teams as well as operational partners and stakeholders to coordinate the outbreak response and provide tactical advice.

Defra corporate services:

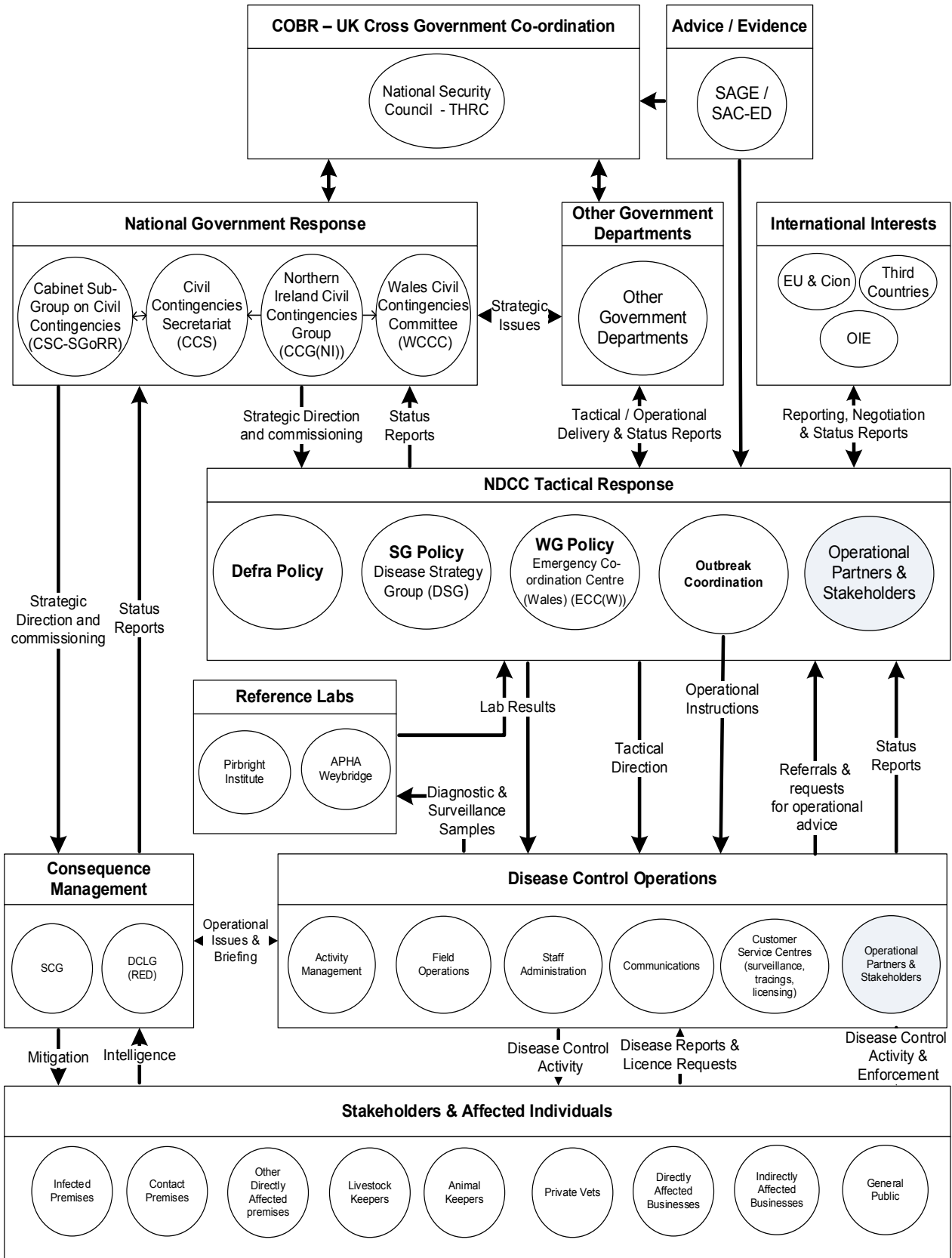
- To provide specialist support and advice across the Defra Group.

3.4 Key roles and responsibilities in the event of an outbreak

At the tactical level, APHA establishes a Central Disease Control Centre (CDCC) headed by the APHA Outbreak Director. The CDCC is a virtual structure and will be located across multiple sites and include functions delivered across the agency. The CDCC coordinates operational activities taking place at the FOBs.

The FOB implements the disease control operation, ensuring that local operational partners and stakeholders are appropriately engaged. The FOB follows tactical direction and policy guidance set out in the relevant disease control strategies, contingency plans and operational instructions. The FOB also report progress of the disease control operation to the outbreak coordination group within the CDCC. A FOB will be established close to the outbreak or incident location, providing an operational base for those teams that are predominantly involved in field based activities such as patrolling, surveillance and field operations. Dependant on the nature of an outbreak, further FOBs may be established. The GB command structure is set out below. Detailed information about structures and procedures can be found in the separate governmental contingency plans.

Command, control and communication structures in Great Britain.



Part Four – Suspicion, notification and disease confirmation

4.1 Suspicion and notification

Rabies is a notifiable disease and anyone who suspects rabies in an animal on whatever premises must report it to APHA via the Defra Rural Services Helpline on: 03000 200 301. Further information on contacting APHA in Wales and Scotland can be found on the [APHA contact pages](#) of .GOV.UK. Failure to report suspicion of rabies is an offence.

Although a definitive diagnosis of rabies cannot be made on clinical grounds alone, the investigating VI may rule out suspicion of disease when they visit the premises and conclude the investigation at this point. Should the VI not be able to rule out rabies on clinical grounds, the animal will become a suspect animal as outlined below.

Should APHA wish to impose restrictions on movement of suspect animals at this stage they would need to have the premises declared an infected place, using the same powers under the RCO as are invoked when a confirmed case has been identified. This should only be used, therefore, if the suspect animal is very likely to be positive because of the potential for causing alarm.

If a VI believes disease exists or has existed they will serve an Infected Place – Notice of Restriction (even without confirmation of disease) to impose conditions in Article 7 of the RCO, which will allow for a number of measures to be applied. This will include restrictions on movement of animals without licence which have been, or may have been, exposed to infection. This will also be applicable to the removal of carcasses. The limits of the premises under restriction will be clearly defined and in the first instance include the whole premises except where otherwise instructed by the policy team.

If rabies seems likely on clinical grounds or confirmed through laboratory test results the Notice already in effect could be amended by the APHA VI in consultation with Defra and devolved government policy teams by issuing an Infected Place – Notice Amending Restriction, which will allow the declared IP to be divided into zones.

4.2 Suspect animals

A suspect animal (or 'case') is one showing clinical signs of the disease. The VI will wish to ensure that any suspect animals are contained if possible, to limit the risk to humans. In a situation where the case is an imported animal from a country of origin with disease free status, the destruction of the suspected animal will not normally be compulsory. This would change in the case of an established outbreak at the place of origin or where the animal is being held.

Any decision to destroy the animal prior to disease confirmation will be discussed between the owners and the VI. The VI or the owner may decide that the animal should be

destroyed on welfare grounds if the animal is distressed. Alternatively, it could be removed to approved premises, for example a quarantine or isolation facility, for observation.

Should there have been a person bitten or scratched by the potentially infected animal, the VI would require the destruction of the animal in order to confirm or rule out a diagnosis of rabies.

Recovery is considered a *de facto* sign that the animal is negative for rabies, given that rabies is invariably fatal. Animals may be restricted for a period of time (usually no longer than two weeks) under observation by veterinary staff.

If rabies seems likely on clinical grounds and exposure history and the animal is confined for observation or humanely destroyed the relevant CVO will raise an 'Amber' alert which will remain until the animal recovers or laboratory results prove positive or negative.

4.3 Contact animals

A contact animal is one which has been in contact with a suspect or confirmed case but is not exhibiting clinical signs of rabies. A contact animal could remain healthy for a period of weeks or less commonly, months while potentially incubating the disease. This creates significant problems for an owner who could be required to keep the animal isolated for this length of time. For this reason, or because they are uncomfortable with the risk to their own or their family's health, an owner may decide to have a contact animal humanely destroyed.

If any contact animals are to be left on the owner's premises, the VI must be assured that the owner can guarantee that the animals will not come into contact with any other non-exposed animals. If the initial suspect animal is confirmed positive for rabies then the animal's quarantine may need to continue for a lengthy period of time. Alternatively, the VI may decide that the premises are not suitable for this purpose and detain the animals, either placing them in isolation or requiring them to be humanely destroyed. Any high risk of infection, for example where the contact animal has been bitten by a suspect animal, will make humane destruction more likely.

Where a contact animal has bitten a human, it may be required to be humanely destroyed in order to allow confirmatory testing for rabies to be undertaken.

4.4 Human risk

If a person has been bitten, scratched or has had broken skin or mucous membrane licked by a suspect animal, the VI will recommend immediate washing of any open wound or contact area with soap or detergent and water and advise the individual to seek medical attention to enable a prompt risk assessment to be carried out. Post-exposure treatment may need to be started before the outcome of clinical observation or laboratory testing of the suspect animal. The VI will immediately notify the Proper Officer or the local Health Protection Team of the biting incident by an animal in which rabies is suspected.

4.5 Disease tracing

The VI will also try to provisionally establish the extent to which the animal may have infected or been infected by unknown animals. If the animal has been at large since the onset of clinical signs or in the 15 days before their onset, this may indicate the necessity of preparing wider control measures as it would be impossible to establish all the animal's contacts in that period.

Similarly, if the animal has or could have been in contact with wildlife during this period it may be necessary to activate the rabies wildlife control strategy in order to begin managing the potential risk of establishing a sylvatic cycle in wildlife.

4.6 Infected premises

The rabies virus cannot live for long outside the body of its host and is destroyed by contact with common household detergents. Premises need only be considered infected until the infected animal has been removed or destroyed and the property has been disinfected (using a [Defra approved disinfectant](#)) and any other animals on the premises have been quarantined and/or destroyed. Animals must not be moved onto the infected premises unless the move is specifically licensed. No animal will be removed from an infected premises unless an exception licence is issued for transport to a designated facility for observation or for humane destruction.

Once the presenting case and all contact animals have been removed from the premises, the infected premises declaration may be lifted, or the controls applied to the premises varied as appropriate to the continuing conditions. Animals remaining on the property must remain under isolation until further direction from the relevant CVO.

4.7 Laboratory diagnosis

If the suspect case is already dead, or the veterinarian and/or owner decide on the humane destruction of the animal or if the animal dies while under observation, the carcass will be transported immediately to the rabies National Reference Laboratory at APHA Weybridge for diagnostic testing.

Results from initial Fluorescent Antibody Test (FAT) testing should be available within a few hours. When results are negative for a suspect case, all contact animals will continue to remain in isolation until further confirmatory results. Reverse Transcription Polymerase Chain Reaction (RT-PCR) or Rabies Tissue Culture Isolation Test (RTCIT) are available, usually within two to three days.

The relevant CVO will take into account the clinical signs of the case, the epidemiological circumstances and the results of more than one test in deciding to confirm disease.

On confirmation of disease, APHA will establish a CDCC and a FOB, inviting key partners to assist in managing the outbreak. For a rabies outbreak these partners will include local

authorities, the police, the National Wildlife Management Centre (NWMC) and PHE (or devolved equivalent). For incidents affecting Wales, the Welsh Government would consider establishing the Emergency Coordination Centre and for Scotland, the Scottish Government Resilience Room.

4.8 Official disease notification to international partners

Defra (or the devolved lead) will inform the World Organisation for Animal Health (OIE¹) and the European Commission of confirmation of disease within 24 hours of confirmation. The OIE sets out requirements which determine when official disease free status can be regained following an outbreak.

If the infected animal was not indigenous to GB, and was an imported animal with no potential spread within GB, after a period of six months disease freedom would be regained. However, if the case involved a fox or indigenous animal, which was not imported, or an imported animal with risk of spread to wildlife, then disease freedom could not be regained for two years.

¹ Office International des Epizooties.

Part Five – Control: domestic animal rabies

5.1 Introduction

The use of wider measures to control the spread of rabies, even in cases where it seems unlikely that an animal has been in a position to infect others, is very likely to be instigated given the serious nature of even a small risk of rabies. Measures will be focused on containing and eradicating the disease quickly to protect human health and to prevent the disease from becoming established in any animal population. Based on the experience of other countries, without rapid and proportionate controls being applied, it is highly likely that a rabies outbreak would lead to the disease becoming endemic in wildlife and potentially the domestic pet population in the UK.

Control measures will begin immediately upon suspicion, though the results of laboratory testing and a detailed history may be needed to identify whether wildlife measures are necessary in addition to those for domestic animals. Control measures for wildlife are considered separately in this document.

Some control measures, in particular vaccination and leashing/muzzling should be considered by pet owners as part of a range of sensible precautions to keep pets safe from injury more generally. Dogs must be microchipped and registered on a database. All puppies should be microchipped and registered by eight weeks of age and all imported dogs of any age to be registered on a database after being in the country for 30 days or on transfer of keepership if sooner². Microchipping is also considered to be good practice and can play an important role in an outbreak in helping to quickly identify stray animals and dog population estimates in affected areas. Having more animals microchipped could significantly reduce the burden on local authorities and reduce the number of animals that might be considered at risk of exposure and requiring destruction though unknown history.

This document does not consider explicitly the use of control measures on animals (including livestock and other herbivores) classified as ‘dead end’ hosts as they are unlikely to transmit rabies. Such animals may still be caught up in control measures should an outbreak occur as, for example, farmers and veterinarians could be at risk from infected livestock if they undertake a detailed clinical examination. The application of proportionate controls will need to be determined depending on the specific circumstances of the incident or outbreak.

5.2 Outbreak scenarios

The most likely scenario for a potential rabies outbreak in GB is via an illegally imported companion animal. Rabies is unlikely to enter GB via a legal route due to the EU rules on

² <https://www.gov.uk/get-your-dog-microchipped>

pet movements³. The table below highlights other possible scenarios involving the disease spreading to wildlife via a potentially infected fox (see chapter six for further information) and a domestic (non-imported) dog that has somehow been infected. This is not intended to cover all possible scenarios, but to table the most likely.

Outbreak scenarios and control measures:

ACTION	SCENARIO	Companion animal in quarantine	European pet or imported dog/cat	GB mammal - wildlife	GB mammal - captive
Declaration of infected place (Art. 5)		NO	YES	YES	YES
Area restrictions around suspect premises ⁴ (Art.9)		NO	YES	YES	YES
Restriction of access to affected animal(s) (Art.7.2)		YES	YES	YES	YES
Notice of intended euthanasia (Art.8)		YES	YES	N/A	YES
No removal of carcass(es) (Art.7.4)		N/A	YES	YES	YES
Isolation & Detention (Art.7.1)		YES	YES	YES	YES
Movement Restrictions (Art.7.3)		NO	YES	NO	YES
Muzzling & Leashing of susceptible animals in an infected area (Sch. 3.2)		NO	YES	YES	YES
Vaccination in an infected area (Sch.3.5) ⁵		NO	YES	YES	YES
Prohibition of activities (Art.11)		NO	YES	YES	NO
Seizure of stray animals (Sch. 3.4)		NO	YES	YES	N/A

³ EU Regulation 576/2013 implemented in Great Britain by SI 2014/3158. http://www.legislation.gov.uk/ukxi/2014/3158/pdfs/ukxi_20143158_en.pdf

⁴ Including land and buildings.

⁵ Either individually or possibly as part of a wider vaccination programme.

Destruction of foxes (Art.10)	NO	N/A	YES ⁶	N/A
Prohibition of animal gatherings (Sch. 3.6)	NO	YES	N/A	NO

Implementation, or not, of all or some of these control measures will be determined by a number of factors, which are examined further in this chapter.

5.3 Control measures

There are various standard control measures that could be used in an outbreak, depending on the severity of the incident and the likely spread of the disease. Whilst each outbreak will have its own specific circumstances the application and potential success of these measures can be assessed based on the experiences of other countries and our own scientific, veterinary and practical expertise.

There is a range of broad scenarios for a rabies outbreak or incident, from a contained case of an individual pet animal, to the highly unlikely worst case of a nationwide outbreak involving both wildlife and domestic animals. To determine the type of controls that might be appropriate under different circumstances, possible scenarios along this spectrum have been considered, whilst recognising that each case will have to be dealt with individually and actions will be determined largely on emerging circumstances. Under all scenarios effective communications will remain vital to ensure the public are appropriately informed about the risks and mitigating actions.

As highlighted in section 5.2, the most likely scenario for a potential rabies outbreak in GB is via an illegally imported companion animal. This is likely to be identified quickly and the source of infection/exposure history will be rapidly investigated (e.g. through recent travel history). In this scenario, the control and containment measures required would be localised, likely to be limited to the infected animal and any other pets that had direct contact. For example, those in the same house. If the animal is in a quarantine establishment, the event would be quickly controlled and no outbreak would be reported.

If infection were to spread to other companion animals, either within the same locality or more widely across the country, then a wider range of controls would be required. For example, leashing/muzzling or vaccination of pets at risk. In the unlikely circumstance that the infection spreads into wildlife, a broader range of wildlife controls would be instigated alongside tighter restrictions on movements of pets, and requirements for vaccination, muzzling and leashes.

A range of the potential activities to be undertaken are outlined briefly here, but the specific measures taken will be dictated by the circumstances of an individual incident or

⁶ This power may not be exercised as policy would most likely be oral vaccination in the first instance.

outbreak, following advice from the NEG. Decisions on the use of control measures in an outbreak will need to take into account the public health risks and the relative costs and benefits and effectiveness of the options.

Table of powers and control measures:

RCO 1974 section:	Measure
Article 5	Declaration of restrictions on infected place.
Article 7 Rule 1	Isolation and detention of affected animal / suspect animal at an infected place.
Article 7 Rule 2	No access to detained animal without licence (exceptions apply).
Article 7 Rule 3	No movement of animals into / out of infected place without licence.
Article 7 Rule 4	No removal of carcase without licence.
Article 7 Rule 5	Animal may be slaughtered ⁷ by or on behalf of owner, after notice of intended slaughter to Veterinary Inspector (VI).
Article 7 Rule 6	Notice of death of animal at infected place to be given to VI.
Article 7 Rule 7	Prohibition on the removal of litter, dung etc. except under licence.
Article 7 Rule 8	Disinfection of parts of the infected place.
Article 7 Rule 9	Display of notices indicating it is an infected place.
Article 8	Notice of intended euthanasia.
Article 9	Declaration of infected area.
Article 10	Destruction of foxes in infected areas.
Article 11	Prohibition of sporting or recreational activity.
Article 12	Erection of warning notices.
PROVISIONS THAT MAY BE APPLIED IN INFECTED AREAS (ARTICLE 9)	

⁷ RCO uses the term 'slaughtered' but for domestic animals this would be expressed as 'euthanased'.

Schedule 3 Prov. 1	Restriction of movement of animals into or out of zone.
Schedule 3 Prov. 2	Control of cats and dogs (leashing and muzzling).
Schedule 3 Prov. 3	Control of animals other than cats and dogs.
Schedule 3 Prov. 4	Seizure, detention and disposal of animals not under control.
Schedule 3 Prov. 5	Compulsory vaccination of animals.
Schedule 3 Prov. 6	Prohibition of gatherings of animals.
Schedule 3 Prov. 7	Prohibition of certain activities (such as hunting ⁸ , racing, shooting).
Schedule 3 Prov. 8	Notification of deaths of animals.

5.4 Tracing

If a rabies case in GB is confirmed, tracing all animals that have been in contact with the case will be essential. Animal contact tracing investigations are the responsibility of the National Emergency Epidemiology Group (NEEG). During an outbreak, the NEEG functions as an operational unit within the NDCC. The NEEG provides epidemiological advice and assessment likely source and spread of infection and will be pivotal to the advice given to inform ADPG and the relevant CVO on disease control and prevention measures including vaccination and surveillance.

Rapid and effective control will depend on establishing whether the initial case identified is the first in the country and to what extent there has been opportunity for further spread.

In the event of the initial case entering GB through illegal activity, the NEEG will work closely with local authorities, law enforcement and/or customs officials to establish the source of the outbreak.

Alternatively, if a stray or wild animal presents with rabies, tracing the index case may be very difficult. Both of these scenarios would therefore make wider control measures more likely.

5.5 Surveillance

In a case where rabies first presents in a pet, the NEEG will be working to identify all contact animals. Contact animals can be considered as being either high risk (which might include close contact with the suspect animal, evidence of biting or wounds, or changes in

⁸ RCO references activities that have been made illegal since it came into force e.g. hunting and cubbing.

behaviour, with no evidence of previous vaccination against rabies) or low risk (an animal that has had possible but unconfirmed contact with the suspect case, or shows no evidence of behavioural changes or biting or wounds, or which has been vaccinated recently against rabies).

If the animal has been unsupervised at any point during the possibly infectious period, or in the scenarios described in this section, surveillance of the wider animal population may be instigated. Notification provisions in Provision VIII of Schedule 3 to the RCO could be of assistance in order to require the notification of animal deaths. Raising awareness of the possibility of infected animals would also be necessary in order that people could report uncharacteristic behaviour to the helpline.

Active surveillance will not involve active testing of animals, as there is no suitable blood test. Passive surveillance through submission and testing of carcasses will continue. Measures to increased awareness for pet owners, local authorities and farmers or land owners, will be put in place.

5.6 Declaring an infected area

The RCO allows government to impose a number of restrictions on movement, premises, gatherings and actions through declaring infected areas. How far these powers are utilised would depend on the nature of the outbreak. Circumstances which might require these stronger powers to be used include:

- Outbreaks where more than one case of rabies is identified with no clear link between them.
- Outbreaks that are located in the wildlife population or may have spread into wildlife.
- Cases where there is the potential that the infected animal may have infected further unknown animals.
- When there is evidence to suggest potentially infected animals may have been imported but are not identified as yet.

Whether to declare an infected area, and measures within, will be a decision taken by the relevant CVO after consultation with NEEG, NEG, ADPG and the Defra Emergency Response Committee. The potential length of time that some measures will need to be in place to be effective will be considered, given the long incubation period for rabies and the implications for effectiveness and for welfare (for example not allowing pets off the lead, not moving them in or out of the infected area until fully vaccinated).

In an outbreak where it was considered that animals in the vicinity surrounding the infected area were at low risk, Defra and the devolved governments will instigate a communications

campaign which will focus on responsible pet ownership and publicising measures that should be taken by the general public and pet owners for their own and their pets' safety.

5.7 Vaccination

Outwith a disease outbreak, rabies vaccine for domestic animals is available via veterinary surgeons and there are no restrictions on pet owners who want to vaccinate their pets against rabies pre-emptively. Pets which have travelled to GB under the Pet Travel Scheme will have been vaccinated against rabies before any journey takes place.

When an outbreak has been declared, decisions about whether to advise or require vaccination, the area involved and the level of vaccine uptake required will be made by ADPG, using expert advice from the NEG during the early stages of each rabies incident or outbreak. A vaccination programme for wild animals would differ from that involving pet animals as oral baiting will be deployed.

Vaccination as a control measure in a declared infected area is likely to be used when the infection may not have been contained or if wildlife is involved. Conversely, vaccination is less likely to be deployed in minor or localised incidents which are resolved quickly. If a decision is taken to compulsorily vaccinate, government would work with producers to ensure adequate supplies of vaccine are available.

Practical issues associated with the use of vaccination which would need to be considered are:

a) Supply: Depending on whether the vaccination strategy is for pets or for wildlife. Control in pets using vaccination will depend on the pet density and the level of contact the index case had with other animals in the infected area. In the event of high numbers of contacts, vaccine supply may not be sufficient immediately. Therefore, restricting the movement of pets to avoid any further contacts (through muzzling and leashing) will be important to cover the period of vaccine production and immunity development following vaccination.

When high numbers of pets are being vaccinated, replenishing the supply of rabies vaccine may be slow and therefore there is a potential delay in achieving control through vaccination of dogs and cats. This is mitigated by controlling pet movements and contacts around the infected area.

b) Enforcement: The relevant CVO may require compulsory vaccination in a specific area. Any compulsory measures would require declaring the area where measures are to be imposed as an infected area. Local authorities will enforce the vaccination programme.

When the relevant CVO decides not to make vaccination compulsory, local communications will be used to explain the risks associated with rabies and the benefits of voluntary vaccination to pet owners. APHA would liaise with private veterinarians within the designated area to monitor local take-up.

Where compulsory vaccination is required, owners must be able to prove their animal has been fully vaccinated, through correct documentation (passport or private veterinary surgery records checked against the microchip in the dog for identification purposes and registering vaccination with their private veterinary surgeon. Otherwise, animals will be vaccinated and identified by the authorities through the vaccination campaign. It is noted that currently there is no legal requirement for cats to be microchipped and that local authorities do not have legal or enforcement responsibility in respect of cats.

c) Costs: The costs associated with any compulsory vaccination campaign in an infected area would be met by government.

5.8 Destruction and detention

Any domestic animal that is suspected as having been infected by rabies will be humanely destroyed. Under exceptional circumstances animals suspected of being infected may be detained in supervised isolation rather than destroyed depending on their condition, rabies vaccination status, welfare needs and a veterinary assessment.

The approach to be adopted for dealing with animals in the same house as confirmed cases is described in section 4.3.

5.9 Movement restrictions

Restrictions on the movement of pet animals could be introduced once an infected area has been established. Movement restrictions could mean either confining animals to their owners' premises or controlling the movement of pets in and out of an infected area.

Restricting pets to owners' homes and gardens should be considered as a possible control measure under any rabies outbreak scenario. For minor or localised incidents such controls may not be viewed as proportionate given the challenges that pet owners would face in meeting the longer term welfare needs of the animal. Enforcement of these controls would require a significant commitment of local authority time and resources. For more significant incidents or a wildlife outbreak, such restrictions are more likely to be imposed.

Restricting movement in and out of an infected area presents particular logistical and practical issues but is an option that will need to be considered at each stage of an outbreak.

5.10 Behavioural restrictions

The use of behavioural restrictions will be determined depending on the particular circumstances of an outbreak but should be proportionate and practical. The key behavioural restrictions that could be enforced in an infected area are:

- Leashing: Requiring dogs to be on leads at all times when not on their owners' premises.

- Muzzling: Requiring dogs to be muzzled when outside their owners' premises.

As with other control measures, the use of these restrictions is more likely where the index case is known to have had contact with other pets or wildlife outside the premises. These restrictions will be encouraged through communications activities, and may be required and enforced by local authorities as part of an infected area.

5.11 Gatherings involving the presence of pet animals

Gatherings i.e. a cat, dog or domestic animal show where there are pets being shown within a declared infected area, could be banned under the provisions of the RCO. Gatherings outside the infected area may still take place, but government may decide to allow these only under licence. Banning such gatherings outside the infected area is likely only to be considered a proportionate response in major outbreaks or where there is a risk that the disease could be spread by infected wildlife.

The alternative to banning a gathering would be to require dog and cat shows to be licensed which would allow these shows to go ahead with certain restrictions such as requiring all participating animals to be vaccinated prior to the gathering and housed separately. Local authorities would have responsibility for enforcement of licencing conditions.

5.12 Control of strays

The control of stray animals in an infected area is the responsibility of the local authority and is necessary to prevent stray or uncontrolled animals becoming a reservoir for the disease. Local authorities also have the power to seize animals (as do the police) if the owner fails to comply with any control provisions. Local authorities will need to locate detention facilities within their area and both APHA and devolved governments will need to be informed via the FOB of the location of these detention sites. Local authorities have implementation plans for dealing with rabies outbreaks that will include identifying potential holding areas for stray animals. They should work closely with animal welfare shelters on monitoring of stray animals and when considering options for control.

The enforcement of these controls would require a significant commitment of local authority time and resources so the likelihood of using this control method would increase in line with the severity of the incident. If an animal from the stray population presents with rabies, then the control of stray animals would be an essential disease control measure.

5.13 Communications / raising awareness

An important control measure in all scenarios is informing the public and raising awareness, particularly among veterinarians and pet owners. See chapter 7 for details of proposed communications strategies for dealing with a rabies outbreak.

Reporting of the disease: Rabies is a notifiable disease in animals and humans. Communications encouraging reporting of suspicion of the disease will need to be developed in conjunction with the relevant local authority and key stakeholders.

An increase in reporting of possible cases is likely as soon as an outbreak is declared, as veterinarians adjust from a scenario where clinical signs are unlikely to arouse suspicion, to a position where clinical signs could indicate the disease.

A helpline would be set up for members of the public to report either wild or domestic animals behaving strangely or biting incidents. This could be a national or local helpline, depending on the scale of the outbreak.

Reporting of bites: Until the extent of an outbreak is known, all domestic animal or human population biting incidents within the designated area will need to be treated as potentially infected and will need to be reported as quickly as possible to a veterinarian or doctor. Communications campaigns reinforcing this message will need to be undertaken by local authorities and stakeholders in conjunction with Defra and devolved governments who would be responsible for human health aspects of biting incidents.

5.14 Exit strategies

Drawing up an exit strategy from a rabies outbreak would largely be influenced by the circumstances specific to the particular outbreak and determined by the following considerations:

- Size, number and type of affected premises.
- Geographical factors (size of infected area; density and type of animals present).
- Number and species of animals testing positive.
- Number of contact animals.
- Affected animal species that may have varying disease incubation periods.

A key factor in determining an exit strategy for the lifting of restrictions placed on a premises and/or area would be the source of infection and is for the NEEG to advise the relevant CVO and policy leads.

As highlighted in section 4.8, depending on the circumstances, it would take up to two years for GB to regain its OIE 'Disease Free' status for rabies following an outbreak. Where rabies has been detected in wildlife, GB would be applying for disease free status to be reinstated two years after the last detected case. During this time heightened passive surveillance and testing of fox carcasses would be carried out.

In addition to the outbreak control measures described in section 5.2, the table below indicates likely actions in each scenario to determine our return to disease free status.

SCENARIO ACTION	Pet in quarantine	European pet or imported dog/cat	Rabid fox (indigenous case)	GB mammal (indigenous case)
Time to disease free status regained	NONE	SIX MONTHS	TWO YEARS	TWO YEARS
Area restrictions around suspect premises	NO	YES	YES	YES
Compulsory vaccination	YES	YES	YES*	YES*
Additional passive surveillance	YES	YES	YES	YES
Additional active surveillance**	NO	NO	YES	YES

* For valuable livestock or equidae, vaccination may be considered.

** Where active surveillance is to check for vaccination success of >70%.

Part Six – Control: wildlife rabies

6.1 Introduction

A number of European countries have become rabies free in the past few years through the control of rabies in wildlife. Their experiences provide significant information about the best method for creating disease freedom. Advances in vaccination techniques mean that it should be possible to vaccinate widely throughout a potentially infected area and keep destruction of 'at risk' animals to a minimum. Initial modelling of disease spread among foxes and costs of vaccinating and culling can be used to determine the circumstances under which each might be preferable.

All mammals are susceptible to rabies. Though epidemiological data suggests strains of classical rabies virus appear to have a degree of host specificity, for disease control purposes a precautionary position would be taken with an assumption that the rabies virus can move readily between hosts of different species including from domestic pets to wildlife and vice versa. This has important implications for control of rabies in GB, which has a potentially susceptible species population including foxes, badgers and domestic dogs and cats.

GB's large fox population could potentially provide a significant reservoir for the disease so much of the vaccination effort would need to be directed at this species. Similarly, badgers, though not a significant reservoir in other countries, could prove to be important, given widely spread populations. Free roaming cats are a potential challenge in any rabies outbreak, but whilst posing a public health risk, they are generally not considered important in the establishment and transmission of infection. Free roaming dogs are not commonly seen in large numbers in GB, but during an outbreak more pet dogs may be abandoned. Close cooperation between NWMC and local authorities will be necessary to minimise the risks posed by these different groups of animals.

6.2 Confirmation of rabies in wildlife

Confirmation of rabies in wildlife will be made by the relevant CVO after advice from APHA and other experts. The decision can be taken to begin controls for a wildlife rabies incident without laboratory confirmation in wildlife, for example, if a confirmed domestic rabies case has had contact with wildlife. This is because of the relative difficulty of confirming rabies in wildlife, the possibility that it could go undetected for a long time, and the wide area of infection and range of susceptible species that may be involved.

Alternatively, there may be suspicion of rabies in a wild animal. If rabies presented in a wild animal, either because its suspicious behaviour had led it to be reported and captured and then tested, or in a routine testing of a wild animal carcass, then it would need to be assumed that a full scale wildlife rabies outbreak was a possibility as the animal would be

very unlikely to be the primary case (only a small percentage of rabies cases in wildlife are identified). Detailed surveillance would need to be arranged to confirm the extent of spread in the wildlife population, and therefore to validate the size of the control area. Virus typing may indicate the likely source of infection.

6.3 Control measures

NWMC's rabies model will be used to make an initial determination as to the size of the area of operations necessary for the successful control of disease and the combination of approaches to maximise the cost/benefit of intervention.

First confirmed case is in wildlife: A vaccination programme in the relevant area should commence immediately, even if there is no evidence of onwards transmission. The need for control without delay is supported by modelling work. Vaccines will be administered by baits rather than trapping, injection, and release.

First confirmed case is in a pet and no epidemiological link to wildlife species can be identified: A wildlife vaccination programme should not be triggered until disease is confirmed or a significant epidemiological link to wildlife is identified during the investigation.

First confirmed case identified in a pet with potential epidemiological link to wildlife: In this case the enhanced passive surveillance, i.e. the testing of wildlife carcasses, should be considered as a potential preparatory step, together with other evidence, by the NEG who should make a recommendation to ADPG. Active surveillance, through shooting or poisoning wildlife is not considered an efficient or appropriate control measure.

The NWMC will coordinate actions in regard to wildlife disease control. In a case where there is a domestic animal rabies element to an outbreak, they will also need to liaise with APHA to coordinate efforts between domestic animal and wildlife control.

In any scenario involving wildlife, identifying the effect the local habitat and the wildlife population density (foxes, primarily, but badgers and other mammals also) will be paramount.

Routine testing for rabies during rabies-free periods is not necessary unless clinical signs dictate otherwise. Wildlife rabies vaccination should continue for two years after the last confirmed case, and during this time routine testing of wildlife in the general area would be expected.

6.4 Species affected by control measures

Foxes: Powers under the Animal Health Act 1981 can be introduced if needed for the vaccination of foxes. The decision of what vaccine to use will be taken by the relevant CVO following advice from the NEG who in turn will have discussed with APHA and

NWMC. Any vaccine not approved in GB will require ministerial approval before use. NWMC will organise the distribution of oral baits.

Poison baits can also be used to control the wildlife reservoir. However, there are a number of issues associated with the use of poison, particularly in urban locations, including the risk posed to pets and children and the fact that poisoning is more time consuming than vaccination, that would need to be taken into account before this was agreed as the preferred method of disease control.

Vaccination is the preferred disease control method wherever possible once the necessary legal powers are in place. A series of vaccination interventions over several years may be required to achieve eradication.

Badgers: Although the red fox is the wildlife species most commonly associated with sylvatic rabies other carnivores can potentially be infected and transmit the virus. In GB, the second species of primary concern is the European badger. Badgers will be of concern in a rabies outbreak due to the high numbers prevalent in some areas of GB. It is considered that the oral vaccine used in foxes is less effective in badgers. Control would be organised by NWMC.

Feral cats: Feral cats are deemed to be a group of three or more un-owned, unconfined cats. Such animals are a possible bridge for transmission of rabies between domestic and wild animals. Close working with local authorities will be needed in any strategy relating to the control of feral cats, as stray domestic cats will remain the responsibility of the local authorities and overlap between these two groups is likely. Again, control would be organised by NWMC.

Feral cats are associated with urban industrial premises and large institutions like hospitals. Farm cats are not considered to be feral but instead are the responsibility of the owner, who could be placed under a statutory responsibility to confine the animals living on his or her land. Local authorities have responsibility for enforcement.

Records of feral cat populations are not kept so work will have to be carried out to identify actual and potential feral cat populations.

Bats: European bats are not involved in the transmission cycle of classical rabies in Europe. The only regions of the world where this occurs is the 'New World'. Any such bats imported into GB are taken into lifelong quarantine because of the risk they pose. European native bats do not need any form of management in this circumstance. The response where lyssavirus infection is confirmed in bats is explored in more detail in Annex I.

6.5 Areas for control

Rural areas: In rural areas it will be necessary to determine the wildlife population present, particularly the fox density. It will be assumed that there are foxes in the area at a

lower density than in urban areas. The lower number of human dwellings may also allow for more regular bait spread.

Issues that may present if the area to be subject to control measures is a rural area might include:

- Difficult terrain for manual or aerial baiting.
- Disseminating information about the baiting, especially if the area is one which attracts a lot of visitors.
- The time required to establish the whereabouts of badger setts.

Urban areas: In urban areas it will be assumed that foxes will be present. Generally, it will be assumed that badgers are not present unless local information suggests otherwise. If a control zone bisects an urban area, control measures will most likely be extended to include the whole of the urban area.

Issues that may present if the area to be subject to control measures is an urban area might include:

- The comparative high density of foxes in urban areas.
- Difficulties laying baits in areas with high human population density and complex land ownership.
- Difficulties ensuring that baits remain undisturbed in areas that see a large amount of human and domestic animal traffic, for example parks.
- The high number of permissions/notifications that would need to be sought/delivered if baits were to be distributed on private land.

Part Seven – Communications

7.1 Communications strategy

Good communications will be key at every stage of controlling a rabies outbreak. Early, regular and consistent involvement with the media and stakeholders will be necessary in order to ensure that reporting is responsible, accurate and informative, promoting awareness of the issues involved and ensuring that the necessary control measures are understood and accepted, particularly within restricted premises and areas.

The use of social media e.g. Facebook, Twitter and Instagram is becoming increasingly important as a rapid means of both communicating messages and receiving information from stakeholders and members of the public. The GB Rabies Core Group would have a key communications role to play in the event of a rabies outbreak e.g. through the promulgation of information through Group members' own communication networks.

Local authorities, under the Civil Contingencies Act 2004, will play a vital role in communicating with local residencies, businesses and the media. Interested parties such as animal charities, pet owner groups, breed groups and organisers of animal events will need to be kept involved and informed as they will be sending clear messages to their members and it is likely that they will be called on for quotes by the media. Involving as many groups as possible on a regular basis will help to ensure that the message that is disseminated is consistent and accurate.

Keeping the public informed of the nature of the risk and encouraging them to take important precautions in a proportionate manner will be a central principle in controlling the impact on human health, as well as the financial and societal impacts of a rabies incursion.

Key features of the communications strategy will include:

- Communications plan for each stage of an outbreak (suspect case, disease confirmed, during control measures, ongoing controls).
- Agreed key messages that cover several strands (awareness, risk reduction, context and proportionality, acceptance and support for government interventions).
- Public awareness campaigns to increase knowledge of the risks and the various risk reduction measures that people can take.
- Targeted communications aimed at pet owners and those at higher risk of coming into contact with suspect cases to facilitate cooperation with control measures, either voluntary or compulsory.

7.2 Communications in a wildlife rabies outbreak

Communications in a wildlife outbreak would be focused on promoting the safety of human and domestic animal health.

Transparency about the methods to be used will be necessary, for example if bait is to be laid, the public will need to be aware of the health and safety issues involved and how to identify and avoid bait, and encouraged not to interfere with the baits.

Practical advice disease prevention measures that will help control rabies in a wildlife outbreak will be encouraged through campaigns, aimed at pet owners, people living in the area subject to control measures, visitors to the area and children.

Key messages that will need to be disseminated include:

- Dogs should be kept on leads and muzzled and cats kept indoors wherever possible within the infected area.
- Any potential contact between a pet and a wild animal must be reported to a veterinarian.
- Any physical contact between a person and a wild fox must be reported to the health authority immediately.
- Any bite by a susceptible domestic pet within the infected area, regardless of the suspicion of disease, must be reported to the health authority immediately.
- Members of the public that observe an animal acting uncharacteristically should report this to the specially established helpline.
- Baits need to be undisturbed.
- Other communications will manage the necessary notifications and permissions required if baits are to be placed on private land and what to do if baits are disturbed.
- Should the outbreak of rabies involve wildlife and wider populations of animals be at risk then livestock owners need to be aware of the possibility of rabies occurring in their stock.
- Availability of vaccines for domestic animals.

Bat rabies control

1. Introduction

This annex describes government policy for how bat rabies incidents in GB should be managed. It contains specific advice for dealing with bats that are suspected of being infected with bat lyssaviruses. By describing the procedures, all parties involved will be better placed to respond quickly and effectively to the management of a bat rabies incident or suspected case in order to protect public health and to minimise the wider impact on the public and the natural environment.

Most of the sixteen lyssaviruses are known to be carried by bat species. All can cause rabies in humans and other mammals. Only two are commonly reported in Europe European Bat Lyssaviruses Type 1 and Type 2 (EBLV-1 and EBLV-2) though others, BBLV and LBLV, are known. EBLV-1 is commonly associated with the Serotine bat and although recently isolated in UK for the first time, is still only confirmed in a small population of GB bats in a restricted area, therefore EBLV-1 is not considered endemic in GB. Endemic should relate to being found widely in GB with a regular frequency (albeit rarely). EBLV-2 is commonly associated with Daubenton's bat and can be considered as endemic.

This annex does not describe operational processes and procedures as these are a matter for APHA and operational partners such as local authorities.

2. The disease

Bat lyssaviruses appear transmissible to all mammals, including humans where they all cause rabies (i.e. serious and invariably fatal disease in the absence of post-exposure treatment). In common with all other lyssaviruses there is no treatment for rabies caught from bats once clinical signs appear and so prevention of infection and immediate post-exposure treatment is vital.

Diagnosis of rabies in living bats (i.e. lyssavirus infection) is uncertain and a definitive diagnosis can only be made by laboratory testing after the bat's death. Bats in some contexts may be infective without symptoms (e.g. wild caught bats handled briefly before release back to the wild), thus requiring a precautionary approach by bat workers.

Despite the endemic nature of EBLV-2 in GB it is considered that the risk of a human case of rabies in the UK caused by a bat is 'very low', given the low level of contact between the majority of the public and bats; but is not negligible. It should be noted that bats around the

world are known to carry a variety of diseases. However, for bats found in the UK and Europe, only EBLVs are zoonotic.

The Joint Nature Conservation Committee is the public body that advises the UK government and devolved administrations on UK-wide and international nature conservation. The Bat Conservation Trust (BCT) is the principal national non-governmental organisation devoted to the conservation of bats. Information from their National Bat Monitoring Programme⁹ describes seventeen breeding species of bat 'native' to the UK. All can fly here from continental Europe and some may do so regularly, as a migratory behaviour in a long-lived species. Post-exposure treatment in humans is effective in preventing the disease from developing provided it is administered at the appropriate time.

3. Transmission

Bat lyssaviruses are transmitted through contact with an infected bat through a bite or scratch. Research has indicated that the risk of cross species transmission of lyssaviruses from bats to other animals should be considered very low, but is not negligible, and that a precautionary approach to contact with bats should be maintained. There have been incidents worldwide where humans and other animals have contracted rabies and died following infection with bat lyssaviruses. In 2002, a Scottish bat worker died following contact with infected bats.

4. Clinical signs in bats

Bats are nocturnal so if found on the ground during daytime this may also be considered to be abnormal behaviour and likely to give rise to human intervention. Whilst this is often the result of an attack from a cat; or the fact that it is a juvenile animal; or the bat becoming dehydrated; the risk of rabies, whilst minor, must always be considered when encountering a grounded bat (see section 9).

Clinical signs of lyssavirus infection in bats are uncertain and variable. Suggestive behaviours in grounded bats may include unusual aggression, disorientation, uncoordinated movements, trembling and spasms. Excessive vocalisation has also been associated with some clinical cases. The effects of one or more these may inhibit flight, or may also be accompanied by signs of partial paralysis, affecting wings or the swallowing reflex. Conversely, infected bats can also display passively e.g. lethargy, dehydration, avoidance of others and non-grooming.

⁹ The National Bat Monitoring Programme is run by the Bat Conservation Trust, in partnership with the Joint Nature Conservation Committee, and supported and steered by Natural England, Natural Resources Wales, Northern Ireland Environment Agency and Scottish Natural Heritage.

5. Surveillance and disease distribution

APHA operates a passive surveillance programme testing bat carcasses submitted by members of the public. The passive surveillance programme was established in 1986 and over 15,000 bats have been tested.

In order to understand the prevalence of lyssaviruses in the UK bats, an active surveillance programme also ran from 2003 to 2012. Three native species, Daubenton's bats, Natterer's bats and the Serotine bat, were caught from the wild sampled and released. Antibodies to EBLV-2 were found in a small proportion of Daubenton's bats.

A small number of Daubenton's bats tested in GB have been found to be positive for EBLV-2. A table listing these incidents can be seen on the [rabies in bats](#) page on .GOV.UK.

In 2018, two Serotine bats from the same site in southern England tested positive for EBLV-1 virus. Previously, there had been three bats that tested positive for EBLV-1 antibodies in the last decade; a Serotine bat in England and two Natterer's bats in Scotland although in all these cases the virus was not isolated.

6. Legislation and control measures

The powers for controlling a rabies incident in GB are set out in the RCO. However, as EBLV-2 is *endemic* in GB, an incident would not be dealt with in the same way as that for classical rabies, i.e. as an *exotic* disease.

Therefore, the deployment of measures set down in RCO to control the spread of bat lyssaviruses in other species following an incident would, in the main, not be instigated given that there are no known incidences of bat lyssaviruses becoming established in other, more risk-associated, animal populations. Expert advice would be sought in designing and implementing any control measures in animal populations should they be required.

In GB, all bat species and their roosts are legally protected, by both domestic and European habitats legislation. This makes it an offence to deliberately kill, possess or transport a bat unless permitted under licence from a Statutory Nature Conservation Organisation (SNCO)¹⁰.

¹⁰ Natural England, Scottish National Heritage, National Resources Wales and Northern Ireland Environment Agency.

7. Key roles and responsibilities

Arrangements for managing an incident in the different countries of GB would fall to the respective devolved governments whose remits will include responsibility for agriculture and rural affairs (namely Defra, Scottish Government and Welsh Government).

The respective government would be responsible for providing strategic leadership in management of an exotic bat lyssavirus incident. Strategic decisions would be taken by the relevant minister or relevant CVO, delegated as appropriate. Their decisions would be based on advice from bat experts, veterinarians, policy makers, economists and delivery agents e.g. Natural England.

PHE, HPS and Public Health Wales would be responsible, in conjunction with Defra, the devolved governments and the Department of Health, for disseminating information regarding human health in the event of a bat lyssavirus incident including advice for the general public, health practitioners and local authorities. They would also provide advice on pre and post-exposure treatment, issue vaccine and Human Rabies Immunoglobulin, and provide information to the relevant administration on human health aspects of rabies issues.

The BCT National Bat Helpline provides advice to the public on understanding and protecting bats. The helpline number is 0345 1300 228 and their [website](#) provides information on encountering and caring for grounded bats.

8. Reporting

Rabies is a notifiable disease and anyone who suspects rabies in an animal, including bats, must report it to APHA. In England this is via the Defra Rural Services Helpline on: 03000 200 301. Information on contacting APHA in Wales and Scotland can be found on their [contact pages](#) of .GOV.UK. Information on suspect cases will be passed to APHA's Veterinary Exotic Notifiable Disease Unit (VENDU). Failure to report suspicion of rabies is an offence.

Any incident where there is suspect human contact with bats might be reported directly to APHA by the public calling the Defra Rural Services Helpline. Sometimes they will have called the BCT first who will provide them with the relevant APHA contact details. Any dead bats submitted to APHA by BCT or the general public using the BAT01 form, with details of a human contact incident included on the form will be dealt with urgently by the National Reference Laboratory and details of the contact passed on to APHA if the bat tests positive for lyssavirus. Irrespective of the route of reporting, APHA would, as a first priority, contact the person involved in the incident to recommend immediate first aid and advise that they consult their doctor or a Local Health Care Trust to obtain medical advice, and have a prompt risk assessment carried out to determine the need for post-exposure treatment.

9. When encountering a bat

Bats generally avoid people but many species roost in buildings, including homes. In the UK, bats are most active during the summer. This is the time when the public is most likely to encounter a bat which is grounded or exposed away from its roost (e.g. on a wall) and needs to be moved.

BCT's guidance states that in all cases where a member of the public encounters a bat which needs to be moved they should not attempt to handle it unless protected from bites and scratches (using gloves, towels etc.). They should look to contain the bat by carefully placing a box (ice cream tub or shoebox) over the bat and then a piece of cardboard should be inserted underneath, to act as the floor of the container, and the box should be inverted carefully. A bat that appears fit enough to fly again e.g. was seen recently to be flying strongly, then it should be released, preferably at dusk.

If the bat does not appear fit enough to fly then BCT can provide contact details for a suitably trained and vaccinated local bat carer who should be able to advise on the best course of action. They can also provide contact details for the Defra Rural Services Helpline (or APHA if in Wales/Scotland) in order to report if the bat appears unwell or is exhibiting unusual behavioural signs.

In the case of a bat encountered that has bitten or scratched a person or a pet (or been bitten by a pet), and has not been released as covered above, the bat carer will assess the bat for possible signs of rabies and report this to the relevant country authority.

10. Suspect bats: risk assessment

A suspect animal is one showing clinical signs suggestive of rabies. The VI will undertake a veterinary inquiry to obtain the facts and inform their decision about whether to investigate the incident first hand. The person with the bat must be advised to safely retain it (taking into account the welfare of the animal) and keep it isolated from all other animals and people until a decision on next steps has been made. In these circumstances, where an animal is suspected of having rabies, a VI can serve a notice on the occupier of the premises declaring that the premises are infected premises under the RCO. However, it is not the intention to control endemic bat lyssaviruses in GB, only exotic viruses.

In this instance, the rules under RCO will also apply with regard to detention and isolation of the animal. Although a definitive diagnosis of rabies in bats cannot be made on clinical grounds alone, if the VI considers that the bat might be showing signs that could be consistent with the disease, on the basis of the information obtained and in discussion with VENDU as necessary, it must be treated as a suspect case. The VI must visit, arrange for the bat to be euthanased, establish all possible contacts (human and animal) and consider restrictions on the premises. During the veterinary inquiry, the investigating VI consults VENDU by phone to agree on the outcome of the investigation.

Where a bat has been euthanased due to the suspicion of rabies, the VI must submit the bat to APHA for testing.

11. Treatment/disease risk mitigation in humans

The risk to humans from bat lyssaviruses is considered to be very low, given the occasional contact between the public and bats, the effectiveness of the protective combination of pre and post-exposure treatment, and that those people most likely to handle bats are vaccinated against rabies. Nevertheless, government takes a precautionary approach to possible contact with bats by bat workers and others who are more likely to handle bats as well as any incident where a member of the public has come into contact with a bat. PHE is responsible for protecting public health in England and provides advice on pre and post exposure treatment for rabies. Parallel bodies in the devolved governments, HPS and PHW, are responsible for the provision of such advice in their territories.

It is therefore essential that any person who may have been bitten or scratched by a bat seeks prompt medical attention through contacting their GP or calling the NHS non-emergency number 111. Once clinical signs in humans have begun the disease is invariably fatal so rapid intervention after the incident is vital. Immediate cleansing of the wound with soap and water followed by an alcohol based or other disinfectant could lower the risk of rabies developing. Based on the risk assessment carried out by a health care professional, this may be combined with prompt post-exposure vaccination and administration of rabies immunoglobulin if necessary. Post-exposure treatment needs to be administered in a very specific manner in order to be effective. Recommendations for the use of rabies vaccine and immunoglobulin can be found in the PHE [Green Book](#) (Immunisation against infectious disease).

12. Euthanasia of bats

Consideration must be given to conservation issues when dealing with bats. However, as explained earlier, powers are available to euthanase bats, if required, for protecting human health as well as animal health and welfare. Suspicion of rabies in any animal species must be reported to APHA without delay. The report will trigger an investigation by a VI overseen by VENDU. If the suspicion of rabies cannot be ruled out then the bat must be euthanased and submitted to APHA for testing.

If rabies is ruled out on clinical grounds after inspection, a native species can be rehabilitated by a bat carer and released into the wild if deemed appropriate. A licence for temporary possession of the animal would not be required as the habitats legislation's 'tending' defence would apply. If the bat is a non-native species then the 'illegal landing' process would continue to be followed.

Euthanasia of non-suspect bats should only be undertaken on welfare grounds, for example, if the bat is badly injured. The VI would make this decision with consideration to

the habitats legislation in consultation with the SNCO and in line with their responsibilities for the welfare of animals under their Royal College of Veterinary Surgeons' Guide to Professional Conduct.

13. Follow-up surveillance

Expert advice would be sought in designing and implementing any surveillance activities. Follow up surveillance may be recommended for example where there is evidence of an exotic lyssavirus in bats; where there is evidence of a new bat species involved or if there is likelihood of human interaction. This policy, and the reference to an incident that needs to be controlled, acknowledges the current stable and low levels of EBLV-1 and EBLV-2 in GB bats and that this situation does not constitute a scenario that would require any control measures. To escalate to such a level would require a decision by Defra policy officials supported by the NEG.

14. International disease reporting obligations

The UK's 'rabies free' status under OIE is not affected by the identification of bat lyssaviruses so there are no mandatory international reporting requirements if this virus is detected. Defra does, however, routinely notify the OIE when such cases are confirmed, and there is a national statutory requirement to report suspect cases of rabies.

The UK will also report rabies data to the World Health Organisation Rabies Bulletin.

Glossary of abbreviations

ADPG	Animal Disease Policy Group
APHA	Animal & Plant Health Agency
BCT	Bat Conservation Trust
CDCC	Central Disease Control Centre (APHA)
CVO	Chief Veterinary Officer
EBLV	European Bat Lyssavirus
FOB	Forward Operating Base (APHA)
NDCC	National Disease Control Centre (APHA)
NEG	National Experts Group
NEEG	National Emergency Epidemiology Group
NWMC	National Wildlife Management Centre
OIE	Office International des Epizooties (World Organisation for Animal Health)
PHE	Public Health England
RCO	Rabies (Control) Order 1974
SNCO	Statutory Nature Conservation Organisation
VI	Veterinary Inspector