

Wildlife Detection Dogs for Ecological Surveys and Conservation Research: UK Good Practice Guidelines



First Edition

Guidelines developed by
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Reference as: Wilson *et al.*, (2026) Wildlife Detection Dogs for Ecological Surveys and Conservation Research: UK Good Practice Guidelines (First Edition).

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About the authors

Louise Wilson has over 22 years of experience as a specialist detection dog handler and trainer, working across explosive, drug, cash, tobacco, live body, cadaver, pest, and wildlife detection. She launched the first UK-based Conservation Dog Section in 2010 after years of collaborating with individuals and organisations to promote and develop the ethical use of detection dogs within ecology and conservation. As the founder and director of Conservation K9 Consultancy, Louise provides bespoke training for wildlife detection dog-handler teams across the UK and internationally. Her operational detection experience spans a wide range of UK species and target types, including animal scats, carcasses, field signs, burrows, plant detection, wildlife crime investigations, and invasive species. This work includes successful deployment for water vole signs, bat and bird carcasses, hedgehog, amphibian remains, pine marten scat, vermin, and other mammal projects. In addition to her UK-based work, Louise also has extensive experience with international target-species detection, including products of animal origin, contributing to global efforts in wildlife conservation, biosecurity, and illegal wildlife trade prevention.

Louise and her team have also trained and successfully deployed the UK's first otter holt detection dog, contributing valuable data and insight to ongoing research in this field. Her work has supported scientific studies and resulted in co-authorship of peer-reviewed papers relating to wildlife detection dogs. Conservation K9 Consultancy became accredited by Working Dogs for Conservation for vermin detection in 2019. Louise and her teams at Conservation K9 Consultancy are the only civilian organisation deployed to assist the UK National Wildlife Crime Unit with their detection dogs. In recognition of their exceptional contribution, Henry received the prestigious IFAW Animal Hero Award for Lifetime Contributions to Conservation in 2025.

Nikki Glover is a Senior Environmental Detection Dog Handler at Wessex Water and the founder of the organisation's detection dog team, which she first established in 2017 while working in her previous role as an ecologist. Recognising the potential for well-trained detection dogs to transform environmental investigations, she assembled the detection dog team from scratch, setting high standards for welfare, training methodology, and operational deployment. Nikki now works with a team of five specialist detection dogs, each trained for dedicated environmental roles: wastewater misconnection-detection dogs, trained through CAPE, where

they learned to identify the specific odour signatures associated with foul-water entering the surface-water system. Their work supports targeted pollution investigations and contributes directly to improving river health. Ecological detection dogs, trained through Conservation K9 Consultancy, specialising in locating great crested newts using non-invasive, welfare-led search techniques that improve survey efficiency and accuracy. Alongside her operational work, Nikki is completing her PhD, during which she conducted the first research proving that detection dogs can successfully detect great crested newts underground. This groundbreaking finding has significantly advanced the field of ecological scent detection and opened new avenues for surveying concealed amphibian populations.

Nikki continues to develop the Wessex Water detection dog team with a strong focus on welfare, continual learning, and practical field collaboration. She values working closely with her dogs and colleagues to explore how well-supported, ethically trained detection-dog teams can make a meaningful contribution to environmental protection and wastewater investigations.

Willow West is an ecologist who has worked in wildlife conservation since 2015, largely focusing on rare and endangered species of birds overseas and in the UK. In 2019, she completed a Masters by Research which investigated the state of bird communities in the Brecon Beacons National Park and assessed the potential for reintroducing hen harrier to the area. A passion for conservation and dogs led to pursuing training to become a wildlife detection dog handler in 2017. Willow has also worked for Natural Resources Wales as an advisor to regulatory and policy reform, within the commercial ecology sector and as a wildlife detection dog handler since 2018, specialising in water-based surveying.

Technical Review Board

The role of this review board was to review the draft version of Wildlife Detection Dogs for Ecological Surveys and Conservation Research: UK Good Practice Guidelines (First Edition). The technical review board provided comments on the draft and suggested edits to be made where applicable. All discussions were considered when producing the final version of these guidelines. The review board comprises a variety of people from varying backgrounds including wildlife detection dog handling and training, ecological consultancies, governing bodies, NGOs, academic and research institutes situated in the UK and internationally. The authors assume no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents. No liability is accepted for any cost claims or losses arising from the use of this document, or any part thereof, for any purpose other than that which it has specifically been prepared for.

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Introduction to the Guidelines

Aim of the Guidelines

At the time of writing, the use of wildlife detection dogs as a survey tool within the UK is in its infancy. A growing interest in the application of this technique suggests there is likely to be a rapid growth in the use of wildlife detection dogs as survey tools (Grimm-Seyfarth 2021 & Beebe *et al* 2016). Wildlife detection is complex and can be influenced by a multitude of factors. Therefore, inadequately trained detection dog teams can be a potential threat to wildlife as well as demote the effectiveness of this tool. The following guidelines aim to maintain high operating standards within this field.

This document has been produced to assist:

- Those wanting to become wildlife detection dog handlers and trainers;
- Companies/Researchers/Non-Government Organisations looking to procure wildlife detection dog teams;
- Governing bodies tasked with reviewing licence applications to train wildlife detection dogs to detect protected species for the purpose of research, conservation and ecological surveys;
- Local planning authorities reviewing planning applications that have used wildlife detection dogs as survey tools and;
- Researchers planning and reviewing data derived from wildlife detection dog teams.

These guidelines do not aim to either override or replace knowledge and experience. The guidelines do not provide a step-by-step guide to become a wildlife detection dog handler, nor do they provide guidance on training a wildlife detection dog. Wildlife detection dog teams require individual training from specialist wildlife detection dog trainers who have operational experience within this field.

What are Wildlife Detection Dog Teams?

Wildlife detection dogs are trained to use their [olfactory senses](#) to locate wildlife including [flora](#) and [fauna](#), across a variety of environments (Bryson 1991, Long *et al* 2007a, Wasser *et al* 2004, Wollett (Smith) *et al* 2014, Orkin *et al* 2016). Unlike humans, who mainly interpret their surroundings through visual and auditory cues, dogs have the exceptional ability to interpret the world through their most powerful sensory organ, their nose. Humans possess 6 million scent receptors, whereas a dog can hold upwards of 220 million [scent receptors](#) (Gilbert 2003, Nature 2020). These scent receptors assist in the detection of and response to [odour molecules](#). Every [solid article](#) on earth produces odour molecules, therefore the detection of any type of wildlife is possible. However, the way the article interacts with its environment can influence its rate of detectability. [Substrate](#), temperature, weather conditions, humidity, time of day are all common factors that can have a profound impact on the [diffusion](#) of scent into the atmosphere (Glover *et al* 2023, Grimm-Seyfarth 2022, Grimm-Seyfarth 2021, Osterkamp 2020, Long *et al* 2007). People working within this field must therefore

have comprehensive knowledge of these factors and how they are likely to influence the detectability rates of their [target species](#) scent (DeMatteo *et al* 2019).

A wildlife detection dog team includes not only highly trained scent detection dogs, but equally highly trained human handlers to facilitate and apply the dogs' scenting abilities. The role of the human part of the team is multifaceted and includes but is not limited to; continual training of the dog, ensuring the dog is safe and cared for, guiding the dog through the survey environment and recording and collecting data. Together, dogs and humans offer a complementary partnership, which allows us to access to a sensory world which is ordinarily outside of our abilities.

Why use Wildlife Detection Dog teams for ecological surveys, conservation, and research?

Although UK wildlife detection is still in its infancy, countries such as Australia, New Zealand, and America have been using wildlife detection dogs for many decades. Numerous research studies undertaken around the world have highlighted wildlife detection dogs in conservation studies increases survey accuracy and decreases survey time (Bryson 1991, Long *et al* 2007a, Wasser *et al* 2004, Wollett (Smith) *et al* 2014, Orkin *et al* 2016).

As DeMatteo *et al.*, (2019) discuss, the use of detection dogs does not have to be limited to a single species or even a single taxonomic group. A wide range of projects have demonstrated how detection dogs contribute to conservation efforts by detecting rare, endangered or difficult to study species (Smith *et al* 2003, Cablk and Heaton 2006, Long *et al* 2007, Dematteo *et al* 2009, Goodwin *et al* 2010, Kerley 2010, Arandjelovic *et al* 2015, Cristescu *et al* 2015, Lehnert and Weeks 2016, Mclean and Sargisson 2012, Hollerbach *et al* 2018). The use of wildlife detection dogs around the world has also expanded to include investigations to detect invasive species, poaching and environmental hazards (Engeman *et al* 2002, Hauser and McCarthy 2009; Vice *et al* 2009, Gsell *et al* 2010, Wollett (Smith) *et al* 2014, Richards 2015, Glen *et al* 2016, Springer 2016, Ward *et al* 2016).

The use of detection dogs means it is no longer necessary to lure species to an area in order to capture their presence, including the use of live traps, hair snares, camera traps, tracking stations, response to vocalisation playbacks. This allows studies to expand and encompass larger, more challenging areas, which modern conventional tools may not have allowed for (Wasser *et al* 2004; DeMatteo *et al* 2014b; Clare *et al* 2015).

The information gained from samples located by detection dogs have been used to develop applied management actions, including deriving population estimates (Long *et al* 2007a, Wasser *et al* 2011, Russell *et al* 2012, Thompson *et al* 2012, Davidson *et al* 2014) and modelling a [multispecies biological corridor](#) (DeMatteo *et al* 201). Most importantly wildlife detection dogs can be used as a [non-invasive](#) method, reducing stress exhibited on the target species. This method can replace other invasive tools which can cause temporary harm, stress, potential death, or discomfort to the target species. However, the effectiveness of this tool is dependent on the professional capabilities of the dog-handler team. High operating standards are required to ensure this tool is used safely and effectively, which is discussed further within this document.

How to use this guidance document

The readers of this guidance document are likely to have varied backgrounds. To accommodate the range of audience members, the guidelines have been separated into Appendix guidance notes. The table below will provide links to different sections within the document depending on the readers intentions within the wildlife detection dog sector.





Introduction

Title of document	Appendix link	Who is the guidance intended for?
Guidance on Hiring a Wildlife Detection Dog Team	Appendix A	Wildlife conservation organisations, research institutions, government agencies, and private entities involved in wildlife management and conservation projects. The document provides valuable insights and recommendations for effectively hiring and utilising wildlife detection dog teams to enhance conservation efforts and achieve accurate results in locating and monitoring wildlife species.
Guidance for Working Dog Welfare	Appendix B	Individuals responsible for the care and well-being of working dogs in wildlife detection and conservation settings. It offers essential information to ensure the health, comfort, and ethical treatment of these dogs before, during and after their involvement in conservation projects.
Guidance for Working with Protected and Invasive Species	Appendix C	Professionals and researchers working in the field of wildlife conservation and ecology, specifically those engaged in projects that involve protected and invasive species. It provides insights and best practices for conducting surveys for protected species and effectively managing invasive species.
Guidance on Factors Influencing Odour and Detection Probability	Appendix D	Wildlife ecologists, conservationists, and researchers who are utilising wildlife detection dogs for various projects. It offers valuable insights into some of the factors that influence scent dispersal and detection probability, assisting practitioners in optimizing their strategies for effective wildlife detection using canine teams.
Guidance for Aspiring Wildlife Detection Dog Handlers	Appendix E	Individuals who aspire to become wildlife detection dog handlers. It provides essential information, advice, and steps to help those interested in entering the field of wildlife detection dog handling. Whether new to dog training or experienced handlers looking to transition into conservation work, this guidance offers valuable insights to help individuals pursue a rewarding career in wildlife detection.

Appendix A:

Guidance on Hiring a Wildlife Detection Dog Team

This document is intended to assist those responsible for procuring wildlife detection dog teams.

Please note at the time of publishing this document there is no UK recognised scheme for assuring wildlife detection dog capabilities.

This document provides guidance on identifying effective wildlife detection dog teams.

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1. Reasons for Employing Wildlife Detection Dogs



Wildlife detection dog handler teams have been scientifically proven to be more efficient and effective than conventional survey methods when the dog-handler team have been appropriately trained and have operational experience (Paula *et al*/2011, Long *et al*/2007, Arnett 2006, Homan *et al*/ 2001). As a wildlife detection dog procurer, it is important to consider several factors before approaching wildlife detection dog teams.





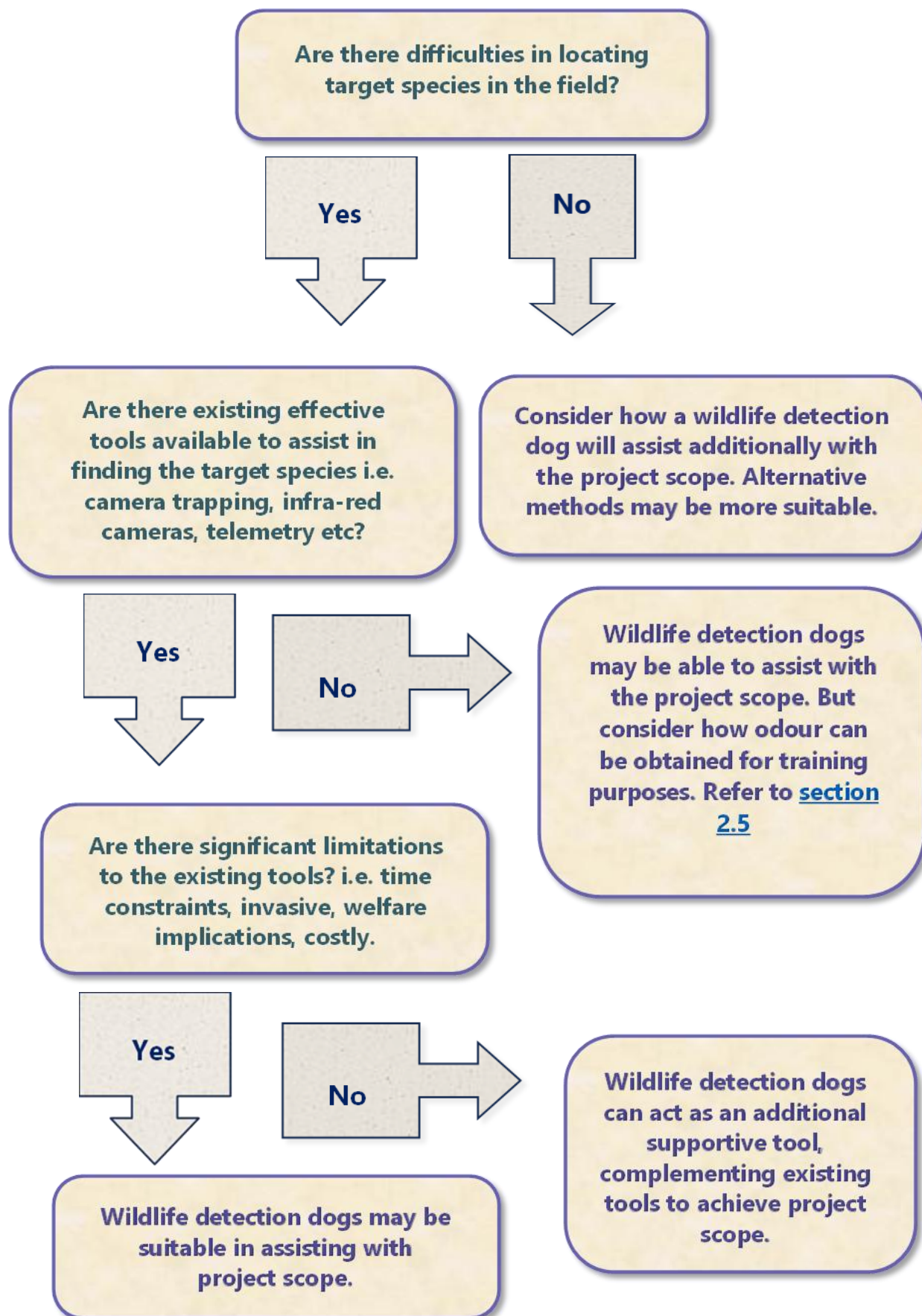
2. Considerations

Employing inexperienced, unknowledgeable dog handler teams within this field can have dire consequences resulting in injury or death to wildlife and livestock, inaccurate results, ineffective survey effort, costs, time implications and downgrading effectiveness of the tool.

The following sections detail factors to consider when approaching wildlife detection dog teams.

3. A Guide to Situations in which Wildlife Detection Teams could Assist with Projects

Wildlife detection dog teams are a valuable resource to aid scientific research, ecology and conservation. However, there will be situations or project in which wildlife detection dogs are not suitable. The following diagram can help establish if a wildlife detection dog team can assist you with your project or whether alternative methods could be more appropriate.





4. What to Look For in a Dog Team to Ensure Competency and Adequate Training

Employing wildlife detection dog teams who have had operational experience and success is essential.

Are the team experienced in detecting the target odour?

Teams already trained to detect the target odour will be able to start the operational work straight away. Those not yet trained on target odour will need to train the dog to find the target scent and have enough time to prepare before operational deployment.

Dog-handler teams that can provide references from previous companies and evidence of success locating target species will likely perform operational searches to suitable operating standards. Procuring handlers with very little experience operationally or those that have operated at poor standards with little success can result in poor data collection, welfare implications to wildlife and dogs as well as potential costly delays and health and safety risks.

Dog-handler teams starting out will need to provide evidence of training through a reputable company that is accredited and endorsed by environmental and detection dog standards. Certifications should be produced from reputable courses showing evidence that the handler and specific dog have been trained and assessed in line with the procurers proposed objectives (refer to [Appendix E](#) regarding assessments).

Teams should only be deployed to carry out wildlife detection in roles in which they have had suitable training and experience.

5. Project Scope

Once a suitable wildlife detection dog team has been identified, it is important to discuss the project scope. Having a clear project scope will allow the handler to determine whether the wildlife detection dog team can provide the service.

Things to consider when discussing project scope

Sourcing target odour for training – who will do this?	Assistance onsite – will an ecologist be present to assist with data collection?
Are licences required?	Health and safety considerations

Working environment (construction site/livestock/public present/etc)	Data collection requirements (will odour need to be collected, GPS'd, marked, relocated etc)
Location of work, access and suitable vehicle parking location	Duration of work
Are efficiency trials required?	Seasonal constraints
Training timeframe required before operational deployment	Repeat services. If the work is for a short duration and unlikely to be required again, the dog-handler team will need to consider whether it is worth their time to imprint the dog and undertake the training prior to operational deployment.



6. Timeframe for Training and Operational Deployment

If the wildlife detection dog team are not currently trained to the target odour required for project scope, then it is important to acknowledge that the team will need to do the following:

- Procure a suitable detection dog for the project
- Source the odour to undertake the training
- Carry out training over a suitable length of time (this will depend on dog and handler experience, complexity of the target odour as well as access to target odour).

Some odours may be more complex to source than others. For example, if the project scope requires the dog-handler team to detect a live target odour then the procurer may need to assist in sourcing the odours for the team due to licencing constraints.

The dog-handler team will also need access to a wide variety of scents to make training more effective for operational deployment. Providing a low number of samples for the dog-handler team and short amount of training time before operational deployment is unlikely to result in operational success. The trainer or dog-handler team will be able to advise on training time as well as number and variety of samples required.

7. Efficiency Trials

As a procurer, you have the right to request efficiency trials to determine whether the wildlife detection dog team is effective. Efficiency trials should be administered by a third party and not by the wildlife detection dog team as the assessment will need to be blind. This means dog-handler teams will not know where odour has been placed. The efficiency trials should mimic the project scope and be undertaken in similar working environments.

Recommendations on trial designs for assessing detection dog teams have already been produced for:

- Bat carcass searches: [Ecological Monitoring using Wildlife Detection Dogs: Bat Carcass Searches at the Wanlip Wind Turbine \(pnnl.gov\)](#)
- Great crested newt searches: [Possessing great crested newts for detection dog training – guidance to inform licensing](#)

It is important to discuss and work with the wildlife detection dog team on the trial design to ensure the design is fair.

Frequency of testing will need to be considered and agreed with the wildlife detection dog team.

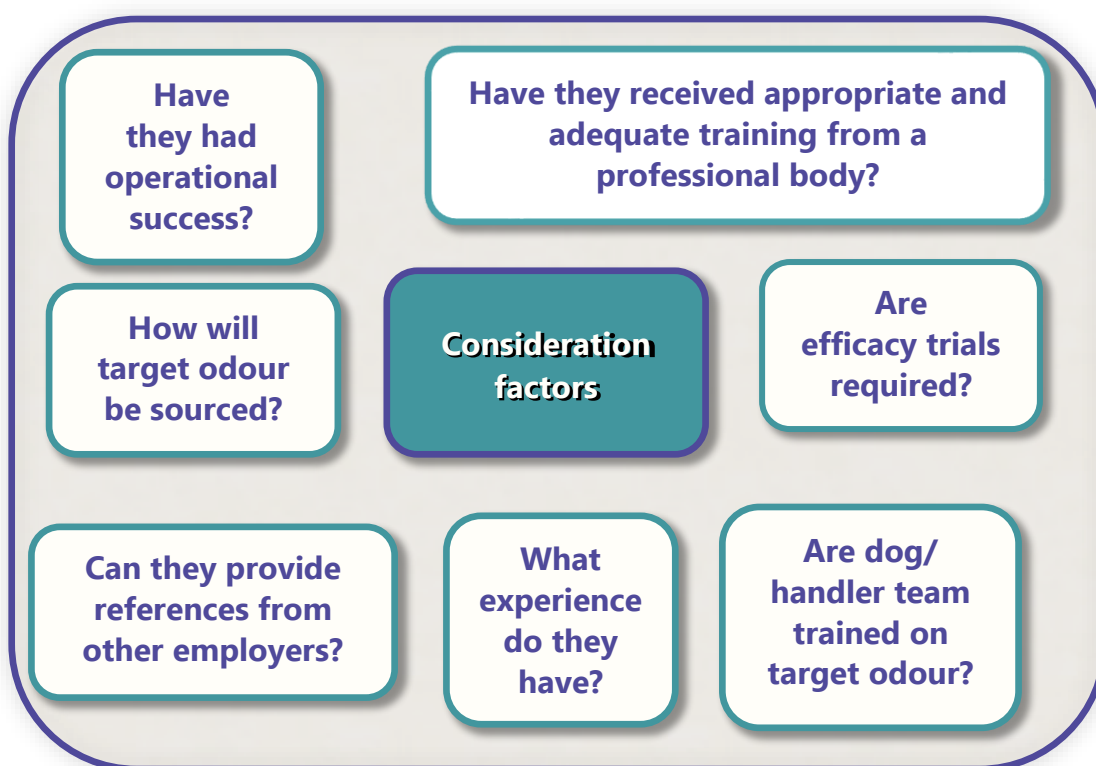


8. Operational Deployment

Once the wildlife detection dog team is ready, operational deployment can commence.

- Risk Assessments and Method Statements should be obtained from the wildlife detection dog team
- Operating procedures should be reviewed and agreed prior to operational deployment
- Liabilities and responsibilities need to be agreed in advance

9. Summary of Factors to Consider





Appendix B

Appendix B: Guidance on Working Dog Welfare, Risks and Control Measures

This guidance document is intended to assist those responsible for the welfare of wildlife detection dogs. By offering practical recommendations and best practices, this document provides dog carers and handlers with information to address the unique needs and challenges associated with safeguarding the physical and mental health of working dogs.

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1. Rest and Welfare

Providing a Safe and Comfortable Rest Area: When the dog is not working (during their days off and/or between searches) access to a safe, clean, quiet environment free of hazards should be provided. The rest area should be comfortable, clean, dry, quiet, draught-free with appropriate ventilation and lit either naturally or artificially. The rest area should have water available at all times and suitable bedding.

Recommended Breaks for Working Dogs: On a working day, it is recommended that dogs are given frequent breaks to ensure adequate relief time. The frequency of the breaks will depend on the search intensity, the individual dog, weather, temperature, humidity, etc. The handler should be able to identify when the detection dog requires relief breaks.

2. Kennel or Housing Considerations

Regular Checks and Monitoring: If your dog is kept in a kennel or a designated part of the house, you should check them frequently and ensure they are not in danger or distressed.

Toilet Area Provision and Schedule: Provide your dog with access to an appropriate place, away from their resting area, which they can use as a toilet area. If they are kept somewhere secure, then allow them out to relieve themselves every few hours or less depending on the requirement of the individual dog.

Ensuring Dogs are Not in Danger or Distressed: Make sure that any place you leave your dog is large enough to provide, at all times, a comfortable area with effective ventilation and temperature control, and that your dog is able to move around to ensure its comfort, avoiding becoming too hot or too cold.

3. Transportation and Safety

Comfort and Safety During Transport: When you transport your dog, make sure they are comfortable and safe at all times. They must be given regular breaks and rest stops.

Access to Water and Regular Breaks: Make sure water is available at all times. However, note that excessive drinking can lead to medical implications.

Avoiding Distress and Unsafe Situations: Do not leave your dog unattended in situations, or for periods of time that are likely to cause them distress or render them unsafe.

4. Enrichment and Mental Stimulation

Enrichment for Dogs Left for Extended Periods: Make sure enrichment is provided when a/the dog is left for an extended period of time, so they do not become bored or distressed. It is important to encourage working dogs to rest, particularly between searches. Therefore, enrichment should be appropriate to the situation.

Resting and Enrichment between Searches: Enrichment should be appropriate to the situation, taking into account workload, over/under stimulation and other considerations. Appropriate rest



5. Nutrition and Feeding

Feeding Requirements for Working Dogs: Working dogs require a substantial diet to sustain them when working operationally as olfaction burns significant calories. Balanced diets should be provided, suitable for their individual needs, to maintain a stable weight and sustain them during the required working time. Handlers should consult with either their veterinarians, trainers or dog dietitians to advise on appropriate food and amount for their individual dog.

Transporting Feed for Consecutive Days: If working away on consecutive days, consider how you will suitably transport feed and the amount you will require to sustain the dog for the length of deployment.

Proper Timing and Quantity of Feeding: You should not feed your dog shortly before, or after, strenuous exercise which includes searching. Feed at least 2 hours before or after to avoid the risk of bloat. Excessive water drinking can also result in vomiting and other medical complications.

6. Multi-Dog Management

Individual Resting Space for Dogs: Handlers will likely have multiple working dogs. It is important that they have their own space to rest individually and are not constantly playing, fighting or guarding.

Ensuring Dogs are Under Control and Safe: Keep your dogs under control and safe at all times and do not let them stray.

7. Health and Veterinary Care

Monitoring Dogs for Injuries, Disease or Illness: Monitor your dog daily and watch out for signs of injury, disease, or illness. You should carefully check your dog's coat regularly following completion of a search and groom your dog to remove any matting or foreign bodies such as seedpods or ticks. Some dogs with thick coats may require additional grooming, including fur clipping.

Routine Preventative Healthcare and Vet Consultation: Routine preventive healthcare, such as vaccination and treatments to control parasites (e.g., fleas and worms), as well as any current health problems your dog may have, is an essential part of keeping your dog healthy and should be kept up to date regularly. Seek advice on appropriate treatments, as some can be toxic to the environment if they enter waterbodies.

Identification in case of theft or separation: All dogs are legally required to be microchipped. All details should be kept up to date in the event separation occurs out in the field.



8. First Aid Training and Injury Risk

First Aid Training for Handlers: It is important for wildlife detection dog handlers to be first aid trained. Handlers should receive training prior to being operationally deployed. The courses should be certified and evidence produced on request.

Being Prepared for Emergencies and Vet Consultation: Consult your vet if you are concerned that your dog has eaten or come into contact with anything that could be harmful. If at any time you have concerns about the health or welfare of your dog, you should seek advice from a veterinary professional. When working operationally, consider the location of the closest vets in case of an emergency.

Injury Risk: Take sensible precautions to keep your dog safe from injury, both when working operationally and outside of work. Site appraisals should be carried out prior to deployment to assess any potential risks.

9. Risk to Dog-Handler Teams and Controls

Below lists provide examples of potential risks dog-handler teams may encounter when working in the field. Handlers should undertake suitable risk assessments on a site-by-site basis with suitable controls and method statements in place.

Risk

Adverse weather conditions **A, B, C, D, F, G**

Heatstroke **C, D, F, M, P**

Hypothermia **D, F, G, P**

Infections by parasitic arthropods and helminths **D, Q, R**

Livestock **A, E, H, I, J, O**

Asbestos **A, E, G, J**

Hazardous objects **A, B, E, G, H, J, N, O, P, Q**

General public **B, H, O**

Terrain **A, B, E, F, H, N, O, P, Q**

Environmental conditions **G, H, N, P, Q**

Poisonous plants/animals **A, D, G, H, L, Q, R**

Vehicles/machinery **A, B, E, H, J, N**

Travelling to and from site **K, M**

Falling objects **A, D, G**

Exhaustion **C, D, F, M, Q, R**

Working at night **A, B, G, O**

Control

(A) Production of Risk Assessment and Method Statements and initial site appraisal if possible.

(B) Handler to have control over the dog out in the field when working both on and off-lead.

(C) Carry out regular breaks so dog is able to work at optimal working capacity and not become exhausted. **(D)** Identify nearest vets/hospital prior to deployment. **(E)** Safe access and egress.

(F) Appropriate competency and experience of handler. **(G)** Appropriate Personal Protective

Equipment. **(H)** Working dog on lead where appropriate. **(I)** Avoid fields with livestock where possible, particularly those with young. **(J)** Clear communication with site owner. **(K)** Safe transportation in line with The Welfare of Animals (Transport) (England) Order 2006 and Welfare of Animals (Transport) (Wales) Order 2007. **(L)** Enquire as to whether nearest vets have anti-venom when working in areas with suspected adders. **(M)** Have access to water and food. **(N)** If site is not deemed safe for handler or dog do not proceed. **(O)** Safety measures put in place for isolated lone working. **(P)** First Aid kit to be carried around onsite for dog and handler, or easy access to kit is required and handler to be dog first aid trained. **(Q)** Undertake regular health checks of dog and grooming following search. **(R)** Have grooming kit available post search including tick comb.





Appendix C: Guidance for Working with Protected and Invasive Species

This document provides an overview of the legislation which should be considered when working with and/or training wildlife detection dogs.
If you are engaging a detection dog team, you may want to ensure that the relevant licences and permissions are in place before commencing work.
If you are a handler and/or trainer, the legislation outlined will need to be considered as part of your working and training protocol.

Some wildlife in the UK are afforded protection under wildlife legislation.

The level of protection varies depending on the conservation status of the species. Some species are individually protected from disturbance, injury and death, whereas other species protection is afforded to both habitats and individuals.

The following provides a summary on the legislative protection currently granted to wildlife in the UK, at the time of publication. Further research will be required on the target species. In some cases, it will be necessary to liaise with governing bodies to determine whether a licence is necessary for training and operational work.

Bear in mind, legislation can change over time and differ slightly across member states (Wales, Scotland, Northern Ireland and England), so it will be necessary to check the specific legislation concerning your target species, prior to commencing work, as well as any potential other species or habitats which may be encountered as part of your project.

Handlers are recommended to work with species specialists, ecologists and to check with local authorities (Natural England, Natural Resources Wales, Scottish Environment Protection Agency) to ensure they are abiding by legislative requirements.



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1. Wild Mammals (Protection) Act 1996 and Protection of Wild Mammals Act (Scotland) 2002

b. The killing in a reasonably swift and humane manner of any such wild mammal if he shows that the wild mammal had been injured or taken in the course of either lawful shooting, hunting, coursing or pest control activity.

c. Doing anything which is authorised by or under any enactment.

d. Any act made unlawful by section 1 if the act was done by means of any snare, trap, dog, or bird lawfully used for the purpose of killing or taking any wild mammal; or

e. The lawful use of any poisonous or noxious substance on any wild mammal.

Covers: England, Wales and Scotland

A "wild mammal" means any mammal which is not a domestic or captive animal within the meaning of the [Protection of Animals Act 1911](#) or the [Protection of Wild Mammals Act \(Scotland\) 2002](#).

The [Wild Mammals \(Protection\) Act 1996](#) makes it an offence for any person to mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering. The [Protection of Wild Mammals Act \(Scotland\) 2002](#) refers specifically to the use of dogs for hunting purposes.

Exemptions apply when:

a. The attempted killing of any such wild mammal as an act of mercy if he shows that the mammal had been so seriously disabled otherwise than by his unlawful act that there was no reasonable chance of its recovering.





2. The Wildlife and Countryside Act 1981 (amended 1985, 1991 Chapter 39)

Covers: England, Wales and Scotland

The Wildlife and Countryside Act 1981 (as amended) is the principal mechanism for protection of wildlife in Great Britain. The Act implements the following:

- [Convention on the Conservation of European Wildlife and Natural Habitats](#) (Bern Convention); [\(79/409/EEC\)](#); [\(92/43/EEC\)](#), in Great Britain.
- European Union Directives on the conservation of wild birds.
- Natural Habitats and Wild Fauna and Flora Directive.

The Act covers the protection of wildlife, including nests and eggs, and wild plants. It extends to the countryside and national parks, and the designation of protected areas including [Sites of Special Scientific Interest](#) (SSSIs), Limestone pavements, National Nature Reserves, and grants by the Nature Conservancy Council (now restructured into [Natural England](#), and the [Countryside Council for Wales](#)).

Certain species of bird are specifically protected under Schedule 1 of The Act, but The Act protects all nesting birds from being disturbed and nests from being damaged or destroyed. The disturbance of nesting birds can potentially be one of the main factors to consider when designing a project using dogs and during the training process for the dogs themselves.

Schedule 1 of The Act protects parts of listed species, including feathers, carcass, nesting material, and eggs. The correct licences will need to be obtained in order to possess these parts for training purposes.

***Failure to comply with the legislation can lead to unlimited fines and up to 6 months imprisonment.**



3. The Invasive Alien Species (Enforcement and Permitting) Order 2019

Covers: England and Wales

The [Invasive Alien Species \(Enforcement and Permitting\) Order 2019](#) refers to the release or escape of invasive alien species listed in Part 1, Schedule 2 of The Order as well as planting or causing to grow plant species listed in Part 2, Schedule 2. This also links back to [The Wildlife and Countryside Act 1981 Section 14ZA\(3\)\(b\)](#).

Invasive alien species will need to be considered as part of your project regardless of whether the target falls under this category because the dog and handler have the potential to inadvertently spread and transfer invasive species to other locations. For example, if working in or near water courses containing zebra mussels (*Dreissena polymorpha*) it is required to sterilize clothing and equipment used before entering water that is free of zebra mussels, to avoid inadvertent transportation and subsequent infestation.

The welfare of the dog must be considered in this and similar scenarios. Is it safe to use disinfectant directly on the dog and if so, in what concentrations and frequencies? It may be safer to use specific PPE for the dog to prevent exposure to chemicals or to devise survey protocol which prevent individual dogs from working across water courses, to avoid cross contamination.

The project may be targeting invasive species and require the storing and use of live animals or plant materials in order to train the dogs. In this case, it is likely that a licence will be required to hold, collect and/or transport these materials.

***Failure to comply with The Invasive Alien Species (Enforcement and Permitting) Order 2019 can result in fines and up to six months imprisonment.**

4. The Conservation of Habitats and Species Regulations 2017

Covers: England, Wales, Scotland and Northern Ireland

The [Conservation of Habitats and Species Regulations 2017](#) offers wider protection for species listed in the [Wildlife and Countryside Act 1981](#). Not only is it an offence to injure or kill animals or to damage nests, it also states that it is an offence to destroy breeding sites and resting places or to impair natural activities such as breeding, migrating, hibernating and nurturing young. Even if your target species is not protected or would be unaffected by the intended study using dogs, there may be species present in the search area that would be disturbed or impaired without considerate planning and training.



5. Animal Welfare Acts

Covers: England, Wales, Scotland, Northern Ireland

The [Animal Welfare Act 2006](#) (England & Wales), [Animal Health and Welfare \(Scotland\) Act 2006](#) and [The Welfare of Animals Act 2011 \(Northern Ireland\)](#), detail the legislation for standards of animal care, across a range of scenarios including wild and domesticated animals. The Acts can differ slightly; therefore, it is important to ensure you familiarise yourself with the specific Acts for your region*. Broadly, the Acts apply to actions taken on the land and all inland waters and estuaries in the United Kingdom, but not the sea. They apply to 'animals', which are defined in the Acts as a vertebrate other than man but do not currently apply to invertebrates or to foetal or embryonic forms of animals. Although The Welfare of Animals Act 2011 (Northern Ireland) could include invertebrates under certain circumstances. The Acts bring together and updates legislation to promote the welfare of vertebrate animals, and primarily applies to those that are owned or held captive. Although the Acts focus on domestic animals, they also apply to wild animals while they are being held captive and can apply to certain wild animals when not held in captivity.

When working within the wildlife detection dog industry, the welfare of the dog and the protected species should be paramount to all practitioners. Failure to seek adequate training and consider welfare during training and deployment, can result in potential fines and prosecutions.

'Protected Animals' under the Acts are defined as:

- Animals that are commonly domesticated in the British Islands
 - Animals under the control of man
 - Animals not living in a wild state

The Acts identify a responsibility for animals in that a person is 'responsible' for an animal where, on a permanent or temporary basis, they have assumed responsibility for the animal's day-to-day care or for its care for a specific purpose.

This regulation also refers to the possession, exchange and transport of any live or dead wild animal, including parts of animals. This will need to be carefully considered when obtaining or storing samples for training dogs. It may be necessary to obtain specific licences. Failure to do so can result in fines and up to six months imprisonment.

Similar protections exist for protected plant species where it is an offence to pick, cut, uproot or destroy them. Projects wishing to detect rare, protected plant species will need to apply for the appropriate licences or permissions in order to be able to source samples for training.



Appendix C

Additionally, each act refers to its own code of practice developed by the nation's government, which specifies further details of welfare standards for specific species.

Each of the devolved governments have a detailed code of practice laid out for dog welfare and the legal requirements enforced by each governing body. ([DEFRA](#), [Welsh Government](#), [Scottish Government](#) & [DAERA-NI](#)).

As a minimum, the law requires that you must take reasonable steps to ensure that a dog has access to the following:

1. A suitable environment to live in;
2. A suitable diet;
3. Appropriate company;
4. Is able to behave normally;
5. Is protected from pain, suffering, injury and disease.

When working within the wildlife detection dog industry, the welfare of the dog and the protected species should be paramount to all practitioners. Failure to seek adequate training and consider welfare during training and deployment, can result in potential fines and prosecutions. **

***The authors and contributors of this document, strongly advise that regardless of the minimum required welfare standards outlined within each Act, readers strive to ensure higher than minimal welfare standards for all animals under their care.**

**** Penalties under the Act can vary from fines to imprisonment of up to 5 years.**



6. QUICK GUIDE:

Key Considerations when Working with Wildlife and Where to Look for Legislative Advice

Are you going to be working
in a designated site?
If so, do you need licence
to work within the site?

CONSERVATION OF HABITATS AND
SPECIES REGULATIONS 2017

THE WILDLIFE AND COUNTRYSIDE
ACT 1981

Are you working around species that
are potentially breeding incubating or
have young?

CONSERVATION OF HABITATS AND
SPECIES REGULATIONS 2017

THE WILDLIFE AND COUNTRYSIDE
ACT 1981

Can you obtain and keep your target
odour legally or will you need to apply
for a licence?

THE WILDLIFE AND COUNTRYSIDE
ACT 1981

ANIMAL WELFARE ACTS –
(ENGLAND & WALES, SCOTLAND,
NORTHERN IRELAND)

Are there biosecurity considerations
for the habitats and/or species you
intend to work with?

THE INVASIVE ALIEN SPECIES
(ENFORCEMENT AND
PERMITTING) ORDER 2019

Will your training and operational
procedures result in implications to
Animal Welfare Acts for your region?

ANIMAL WELFARE ACTS –
(ENGLAND & WALES, SCOTLAND,
NORTHERN IRELAND)



Appendix D: Guidance Note on Factors Influencing Detectability Rates

This document highlights various factors that can affect the performance of wildlife conservation detection dogs during fieldwork. These can act in isolation or combination. The factors covered here are not exhaustive.

Scientific studies have revealed that these variables can affect the dogs' capability to detect specific scents. While this list is not exhaustive, it provides an overview of the most significant factors currently known. As research on canine olfactory abilities continues, additional factors may be discovered.

By understanding factors that influence detectability rates, it is possible to learn to work with or around these factors to produce optimal working teams.

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<u>2. Dog reactions to environment and detection at a distance</u>	<u>Page 31</u>
<u>3. Searches during different times of day</u>	<u>Page 32</u>
<u>4. Seasonal weather variation and temperature</u>	<u>Page 33</u>
<u>5. Vegetation density, substrate interference and water searches</u>	<u>Page 33</u>
<u>6. Target odour characteristics</u>	<u>Page 34</u>



1. Handler Bias and Cues

Studies have found that the way a handler interacts with a detection dog can significantly affect the dog's ability to find target odours.

If dogs are always trained and tested under conditions where handlers know the location of the target item, the dogs may become overly reliant on these cues instead of relying on their sense of smell. This could impact the dog's performance during operational deployments, where the handler may not know the location of the target odour (Clark *et al* 2020, DeChant *et al* 2020, DeMatteo *et al* 2019, Lit *et al* 2011).

Handler cues and bias must be considered when training, making assessments and working operationally. Handlers can inadvertently guide dogs with their body language, gaze, voice, attention, and movements, which can make the dog rely too much on the handler and miss finds in the field.

2. Dog Reactions to Environment and Detection at a Distance

Wherever possible, training should reflect the environment in which operational searches are to take place, in order to prepare the dog and handler for any challenges caused by the environment.

For example, it may be necessary for the dog to work near to loud machinery so training should be focused on desensitising the dog to these distractions and ensuring the dog is not adversely affected by noise. Some individuals may be excellent detection dogs in a quiet environment but struggle to search in loud environments.

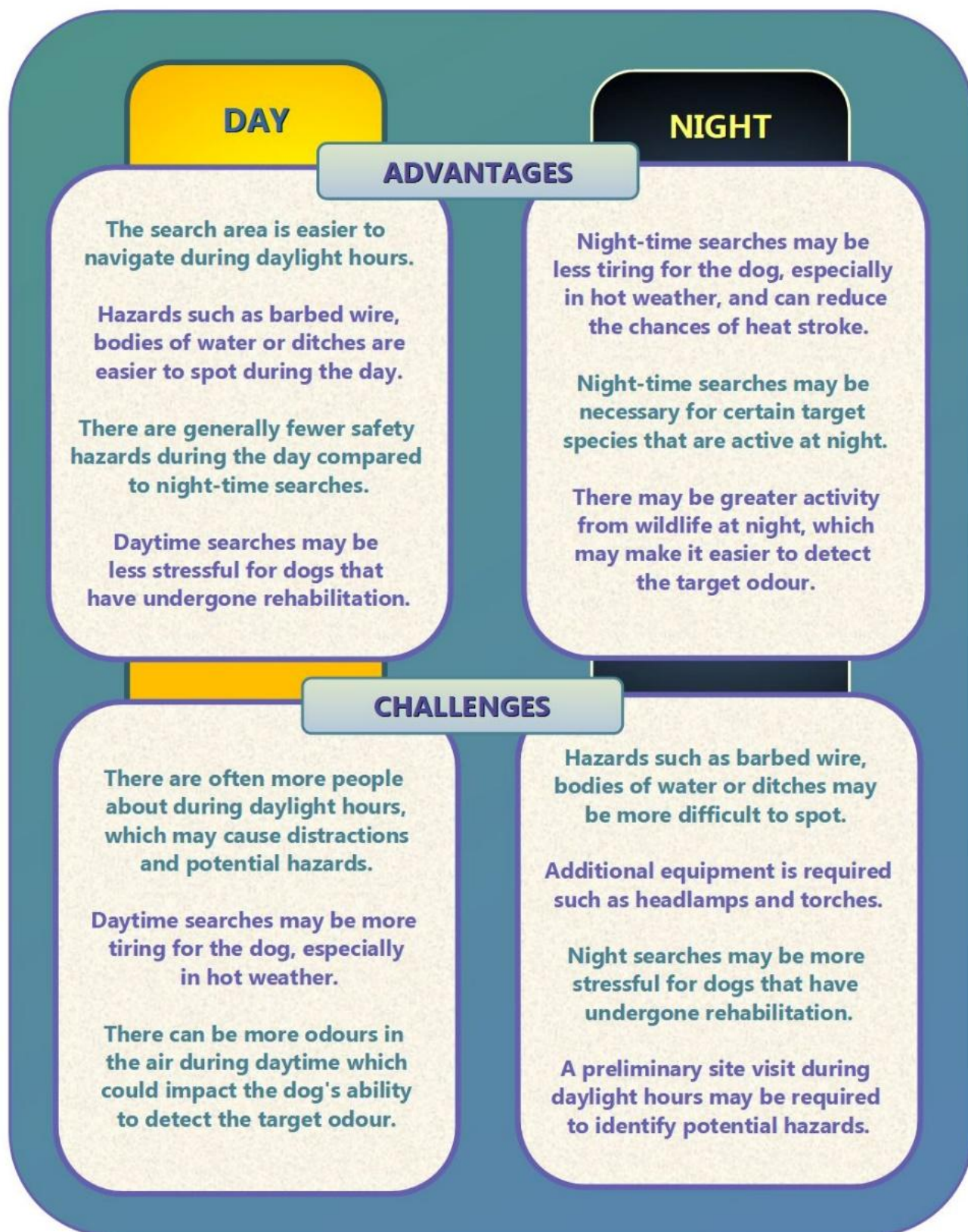
Is the dog likely to encounter wild animals during operational searches? If so, has there been adequate training to assess the dog's reaction to such stimuli? Failure to consider this during training could result in the dog showing interest towards a new smell, becoming aroused and inclined to chase an unexpectedly flushed animal. An additional complication could be the dog becoming frightened by the presence of predator species or large mammals and therefore be unable to effectively carry out their search.

The distance at which the dog can detect the target odour will depend on a variety of factors such as wind conditions, terrain, and the concentration of the odour (Osterkamp 2020).

Understanding the ecology of a species is crucial in deciding whether a detection dog should be trained to detect it from a distance. In cases where the scent of the target odour diffuses very slowly, the dog needs to be trained to indicate even if they are unable to physically reach the source. This is particularly important for burrowing species such as certain amphibians and reptiles, as well as arboreal species.

3. Searches at Different Times of Day

In some cases, it is necessary to consider whether conducting a search during daylight or night-time hours will be most effective and safe for dogs and handlers (Osterkamp 2020).





4. Seasonal Weather Variation and Temperature

Seasonal variations to wildlife behaviour can impact the success of a project. Seasonal weather can limit search operations due to the effect of weather conditions on the dog's sense of smell and other physical factors. The temperature of the air can affect scent particle movement.

When planning a search, it is important to understand the weather conditions to be faced and incorporate them into training sessions. High or low wind speeds, and high or low temperatures, can affect the dog's ability to locate a target. Heavy rainfall and dampness can transport odours far from the source and affect the movement of scent particles. Also, in heavy rainfall dogs can suffer from hypothermia and need appropriate protective clothing and drying. Temperature can affect the nasal cavity, and therefore the effectiveness of olfaction. Heat and humidity can cause fatigue in dogs, particularly those with heavy fur coats, while cold weather can affect smaller or short-haired breeds. The intensity of odour production by targets such as scat or carcasses during decomposition can also be impacted by temperature.

The lifecycle and seasonal habits of each species must be carefully considered to ensure the best chances for detection by the dog, whilst factoring in the least amount of disturbance to the target. Predator/prey interactions and partial seasonal migrations are additional factors to consider.

All of these factors can impact a dog's searching ability and should be considered by handlers before beginning a search operation (Grim-Seyfarth 2022, Osterkamp 2020, Cablk *et al* 2006, Mackay *et al* 2008, Homan *et al* 2001, Gutzwiller 1990).

5. Vegetation Density, Substrate Interference and Water Searches

Despite the challenges posed by vegetation, a dog's ability to navigate it can provide valuable information that would be difficult to obtain without their assistance. The dog handler must have an in-depth understanding of scent particle movement and diffusion around water, and different substrates to adjust the search accordingly.

Vegetation density can hinder a dog's search, limiting its movement and potentially causing injury due to thorns or other harmful plant species. Providing safety equipment such as neoprene jackets can help protect dogs from injury in dense or thorny vegetation. Dense vegetation can also trap scent particles, making it difficult to pinpoint an exact location. The handler must be aware of these situations and adjust their search accordingly. Additionally, vegetation density and terrain can affect the handler's ability to keep up with the dog, so handler suitability and fitness should be considered. Seasonal changes can also impact vegetation density and suitability for a given dog (Arandjelovic 2015, Arnett 2006).

Different substrates are likely to influence the movement of scent by either encouraging the movement or prohibiting its diffusion. It is important to consider substrate when targeting burrow-dwelling species, as it can affect scent movement. In studies, detection dogs responded faster to targets buried in sandy soil than in clay soil and searched differently depending on the soil type (Glover *et al*/2023, Osterkamp 2020, Alexander *et al*/2015).

A good working knowledge of a detection dog's behaviour around water and scent flow disturbance is required for successful water searches. Water can carry scent from the source in both surface and underground flows. When working a detection dog near water, it is important to consider whether to work with or against the flow of the water. If searching for small scats along a water source, it may be better to work with the current to avoid distractions. When detecting otter spraint, some may prefer to work into the current to increase detection rates. Unnecessary wading in water can also disrupt scent movement (Powers 2018, Tirmenstein *et al*/2018, Rolland *et al*/2006).

6. Target Odour Characteristics

The characteristics of the odour of different targets must be considered when training a dog or conducting searches. Effective searches rely on understanding how the odours of different targets vary and how they change over time. Therefore changes in detectability with odour age should be accounted for during training.

Similarly, when training a dog to find carcasses of a specific species, it is important to consider at what stage of decomposition the sample is no longer useful to the project aims.

Depending on the aims of the search, the dog may be required to indicate on any species of bird or mammal, which can vary drastically in size and odour. Therefore, training should include different sizes and species to prepare the dog adequately. Habits and characteristics of the target should also be considered, such as seasonal migration or hibernation, and active times of the day or night. In the case of live targets, the dog may indicate in an area where the animal has previously been, or attempt to track the animal (Moren *et al*/2022, Dominiguez del Valle *et al*/2020, Rust *et al*/2016). The aims and design of the project should decide which behaviours are acceptable, and these should be accounted for in the training process.

Another consideration is trace detection. While dogs are excellent at this task, trace amounts of target odour may not be desirable for wildlife detection. In such cases, careful consideration should be given as to how to train the dog for trace detection, as it may not be possible to confirm the find, and therefore, the handler may be unable to reward the dog with confidence. Repeatedly not rewarding the dog can lead to frustration or cause the dog to perform false indications if not accounted for during training.





Appendix E: Guidance for Aspiring Wildlife Detection Dog Handlers

This document provides an overview for those wanting to work as wildlife detection dog handlers. It provides advice on handler attributes, avenues for effective training for both dog and handler, as well as key practical considerations.

This document should also serve as a guide for those wishing to procure dog teams to assess whether the necessary training has been completed.

Contents

1. Training **Page 36**

Training requirements for aspiring detection dog handlers and examples of training from other countries and detection dog sectors.

2. Continual assessment **Page 37**

Considerations on what continual and external handler assessments should look like.

3. Handler attributes **Page 38**

Definition of the role of handler and what to consider before you decide to become a handler yourself.

Countries with established wildlife detection dog sectors, detection dog sectors with similarities to wildlife detection, and their training and assessment requirements.

1. Training

In the UK, there is no direct path to becoming a wildlife detection dog handler. Nor are there any officially recognised training requirements or regulations.

Those wishing to enter into this line of work, as well as those wishing to engage the services of a detection dog team, will need to be satisfied with the level of experience and training of individual teams with regards to specific projects. **See also [Appendix C](#) – Legislation.**

Although the UK is currently lacking prescribed training requirements, the UK can refer to other countries i.e. [Australasian Conservation Dog Network \(2022\)](#) and other sectors who use detection dogs, which have more established infrastructure for training and assessing dog teams.

No doubt in the near future, the UK will develop regulations and training standards. Until then, using the examples laid out below, readers can gain an understanding of the amount of commitment and experience that is needed to enter the profession and maintain high professional standards.

Countries with established wildlife detection dog sectors, detection dog sectors with similarities to wildlife detection, and their training and assessment requirements.

Conservation dogs: New Zealand

- 18 months initial training
- Weekly continuation training
- Assessment after 6 months of being certified
- Re-assessed every 3 years

Search and rescue dog: United Kingdom

- 2-3 years training and assessment
- Weekly continuation training
- Re-assessed every 3 years
- Similar working conditions to wildlife detection

Australia

- 12 months training and annual assessments via ACDN
- Weekly continuation training



2. Continual Assessment

As can be seen in the *Training* section, continual training is a key component of a successful training program.

Dogs, like their handlers will have ups and downs, health issues and stresses that without continual observation, assessment and record keeping can lead to poor performance. This is no different than in many other sectors of ecology and conservation, where continuous training and assessments are required to ensure high survey standards.

Governing bodies across the UK regulate and stipulate the number of hours and relevant skills needed to be able to work with protected species.

One example of a well-established continuous training framework is the British Trust for Ornithology's (BTO) ringing scheme. In order to become a ringer, you must log hours of ringing and handling of a variety of bird species, under the supervision of a registered trainer. Once you have displayed enough competency, your trainer can recommend you for a licence which allows you to ring unsupervised. To become a trainer requires further training, and the use of different trapping methods require different licences. The whole process can take many years and every individual training session and bird handled is recorded and submitted to the BTO.

Although there is no regulatory body in the UK for wildlife detection dogs at the moment, a similar approach to record all training and assessment which handlers and dogs carry out is advised. These types of records should also be looked for by those wishing to engage the services of a detection dog team. This is no different than what is required for search and rescue dog teams and what is implemented by the New Zealand Department for Conservation, which regulates all wildlife detection dogs in the country.

Another component aspiring handlers and organisations should consider is how assessments of competency have been conducted. Ideally, external assessors should be used to ensure competency of the handler and/or the dog to reduce potential for bias. Framework for external assessments in the areas such as wind turbine carcass searches and great crested newt searches are currently under development and are bound to provide more species-specific advice in the near future.

By applying these ideals, aspiring handlers have an idea of what should be expected of them and where to aim, until the time comes when the industry is (inevitably) more regulated.

Organisations wanting to use wildlife detection dogs can use these ideals for continual assessment, when deciding on who to hire and how they want evidence of competency to be shown by dog teams.





3. Handler Attributes

Definition of 'handler'

A wildlife detection dog handler is defined as a trained individual working cooperatively with a wildlife detection dog to locate target odour, specifically wildlife, in the name of ecology, research, biosecurity or conservation. A handler may also be referred to as a bounder or seeker. However, for simplicity this document refers only to handler.

Considerations for individual target species and project aims are extremely complicated and there is no one size fits all approach.

Different handlers may be more suited to certain types of survey, and different surveys may necessitate dogs with specific physiological attributes suited to the environment they will be working in. These considerations form a complex network of factors that are too extensive to comprehensively address in this informative document.

Before initiating the process of finding and training a wildlife detection dog, or consulting a seasoned trainer, carefully evaluate the checklist provided in Table 1. If you find yourself responding negatively to many of the questions, it is advisable to consider engaging with experienced dog teams rather than pursuing training independently.

Table 1 provides only a glimpse of the considerations aspiring handlers should bear in mind. Further insights and nuances in the field of wildlife detection dogs are best acquired through training and guidance from seasoned professionals with extensive experience in the domain.

Aspiring to become a wildlife detection dog handler is a commitment that entails years of training to achieve a foundational level of competence, followed by a continuous journey of learning and growth throughout your career.

Checklist of questions to ask yourself if you are thinking about becoming a wildlife detection dog handler.

Questions		
<i>Handler specific questions</i>	Yes	No
Are you passionate about wildlife and conservation?		
Do you love to interact with dogs?		
Above all, will you prioritise your dog's welfare?		
Are you willing to work unsociable hours?		
Are you happy to commute long distances and stay away from home?		
Are you happy working outdoors in rough terrain and in bad weather?		
Can you walk long distances?		
Do you have people to assist you with training (outside of training with professionals)?		
Do you have patience in stressful, high-pressure situations?		
Do you think you will be able to keep up with a detection dog out in the field?		
Are you willing to reflect critically on yourself and your dog as part of your continual development?		
Are you willing to improve your skills continuously and learn from other experienced handlers/practitioners in the field?		
Can you carry out regular training during the week to maintain operational skills and fitness levels?		
Do you have financial support available for training?		
Do you have a retirement plan for dogs who are no longer able to work?		



Glossary

Adaptation: The process by which species change over time to better suit their environment, enabling them to survive and reproduce.

Agility: A canine sport that involves navigating through obstacle courses, showcasing a dog's speed, accuracy, and physical abilities.

Behaviour Modification: Techniques used to change a dog's undesirable behaviours through positive reinforcement, desensitisation, and counterconditioning.

Canine Cues: Signals given by the handler that guide the dog's behaviour and responses during detection operations.

Carcass Detection: Training dogs to locate the remains of deceased animals, which can aid in wildlife monitoring and research.

Clicker Training: A method of training that uses a clicker as a marker to reinforce desired behaviours, followed by rewards like treats or praise.

Conservation: The protection and preservation of biodiversity, ecosystems, and natural resources to ensure their sustainable use for future generations.

Conservation Biology: A scientific discipline that focuses on understanding and protecting biodiversity and ecosystems.

Conservation Genetics: The study of genetic diversity and the preservation of genetic resources in order to inform conservation efforts.

Conservation Status: The assessment of the risk of extinction for a species, categorized as: least concern, vulnerable, endangered, or critically endangered, among others.

Crate Training: Introducing a dog to a crate as a safe and comfortable space, helping with housebreaking, transportation, and behaviour management.

Detection Distance: The range at which a detection dog can identify the target odour, whether up close or from a distance.

Diffusion: The movement of molecules from high to low concentration.

Dominance: A concept in dog behaviour that refers to hierarchical relationships; modern training emphasises positive leadership over dominance.

Ecoregion: A large area with distinct ecological characteristics and species, often defined by its unique combination of climate, topography, and vegetation.

Fading: Gradually reducing the frequency of rewards for a behaviour that has been consistently reinforced, leading to more reliable responses.

Fauna: The animal life in a specific area or environment.

Flora: The plant life in a specific area or environment.



Fragmentation: The breaking up of a continuous habitat into smaller, isolated patches, which can lead to reduced biodiversity and ecological imbalances.

Green: The state of being inexperienced or having limited knowledge in a particular area.

Habitat Fragmentation: The process by which large continuous habitats are divided into smaller, isolated fragments, leading to habitat loss and reduced connectivity.

Habitat Loss: The destruction or degradation of natural habitats due to human activities like deforestation, urbanisation, or agriculture.

Habituation: The process by which a dog becomes accustomed to a specific stimulus through repeated exposure, resulting in reduced reactions.

Impulse Control: Teaching a dog to resist immediate gratification and to respond to cues or commands before acting.

Indicator Species: A species that serves as an early warning sign of changes in an ecosystem, often reflecting its health or environmental conditions.

Invasive: Refers to non-native species that have been introduced to a new area and can cause harm to the local ecosystem, economy, or human health.

Keystone Species: A species that has a disproportionately large impact on its ecosystem, affecting the structure and diversity of the entire community.

Luring: Using a treat or object to guide a dog into a desired position or behaviour.

Migration: The seasonal movement of animals from one region to another in search of food, breeding sites, or suitable habitats.

Multispecies Biological Corridor: A natural or man-made pathway that connects and allows for the movement of various species of plants and animals between separate habitats or ecosystems.

Natural Resources: Materials and substances present in the environment that are used by humans for various purposes, including food, water, minerals, and energy.

Non-invasive: Methods or procedures that do not involve penetrating or physically entering an organism, object, or environment, minimizing any potential harm, disturbance, or damage.

Odour Molecules: Tiny particles that carry specific scents and are detected by scent receptors.

Olfactory Receptor Cells: Specialised cells in a dog's nose that detect odours and send signals to the brain.

Olfactory Senses: The sense of smell in animals, including dogs, that is highly developed for detecting scents.

Operant Conditioning: A learning process where a dog associates actions with consequences (rewards) to modify behaviour.

Positive Reinforcement: Rewarding desired behaviours with treats, praise, or toys to increase the likelihood of those behaviours being repeated.

Preservation: The protection and maintenance of ecosystems and species in their natural state, often involving minimal human intervention.



Restoration: The process of returning a degraded ecosystem to its original or near-original state through active management and intervention.

Scat: Animal droppings or excrement that can serve as a valuable source of scent for detection dogs.

Scent Discrimination: A dog's ability to differentiate between different odours.

Scent Receptors: Specialised sensory cells or structures in an animal's nose (or other olfactory organs) responsible for detecting and processing odour molecules from the environment.

Solid Article: An object retaining a scent, used for training purposes.

Species: A group of organisms with similar characteristics that can interbreed and produce fertile offspring.

Stewardship: The responsible management and care of natural resources and the environment to ensure their sustainability for future generations.

Substrate: The surface on which a scent is deposited or on which it travels.

Sustainability: The practice of using resources in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Target Species: The specific animal species trained detection dogs locate.

Target Training: Teaching a dog to touch a specific object (target) with a body part, often used for advanced training and behaviours.

Threatened: Refers to species that are likely to become endangered if protective measures are not taken.

Threshold: The point at which a dog's emotional or physiological response to a stimulus becomes intense, potentially leading to reactive behaviour.

Tracking: A canine skill involving following the scent trail of a specific target.

Unconditioned Stimulus: A natural stimulus that elicits an automatic response in a dog, such as food causing salivation.

Variable Reinforcement: Rewarding behaviours on an unpredictable schedule to maintain a dog's motivation and prevent predictability.

Volatile Organic Compounds (VOCs): Chemical compounds emitted as scents or odours from living organisms, often used by detection dogs to identify targets.

Wildlife: Undomesticated animals (fauna), plants (flora), and other organisms found in a particular ecosystem or geographical area.

Working Dog: A dog trained to perform specific tasks, such as detection work, herding, service tasks, or search and rescue missions.

Yawning: In canine body language, yawning can indicate stress or discomfort, serving as a calming signal to diffuse tension.

Zoonosis: Diseases that can be transmitted between animals and humans, emphasizing the importance of training dogs to avoid risky behaviours.



References and Bibliography

- Alexander, M.B., Hodges, T.K., Bytheway, J. & Aikenhead-Peterson, J.K. (2015) 'Application of soil in forensic science: Residual odour and HRD dogs', *Forensic Science International*, 249, pp. 304–313.
- Arandjelovic, M., Bergl, R.A., Ikfuingei, R., Jameson, C., Parker, M. & Vigilant, L. (2015) 'Detection dog efficacy for collecting faecal samples from the critically endangered Cross River gorilla (*Gorilla gorilla diehli*) for genetic censusing', *Royal Society Open Science*, 2, 140423.
- Arnett, E.B. (2006) 'A preliminary evaluation on the use of dogs to recover bat fatalities at wind energy facilities', *Wildlife Society Bulletin*, 34, pp. 1440–1445.
- Australasian Conservation Dog Network (2022) Conservation Detection Dog Team Evaluation Guidelines.
- Beebe, S.C., Howell, T.J. & Bennett, P.C. (2016) 'Using scent detection dogs in conservation settings: A review of scientific literature regarding their selection', *Frontiers in Veterinary Science*, 3, 96. doi: 10.3389/fvets.2016.00096.
- Bryson, S. (1991) *Search Dog Training*, 3rd printing. Pacific Grove, CA: Boxwood Press.
- Cablk, M.E. & Heaton, J.S. (2006) 'Accuracy and reliability of dogs in surveying for desert tortoise (*Gopherus agassizii*)', *Ecological Applications*, 16, pp. 1926–1935.
- Clark, C.C., Sibbald, N. & Rooney, N.J. (2020) 'Search dog handlers show positive bias when scoring their own dog's performance', *Frontiers in Veterinary Science*, 7, 612.
- Cristescu, R.H., Foley, E., Markula, A., Jackson, G., Jones, D. & Frère, C. (2015) 'Accuracy and efficiency of detection dogs: a powerful new tool for koala conservation and management', *Scientific Reports*, 5, article 8349. doi: 10.1038/srep08349.
- DeChant, M.T., Ford, C. & Hall, N.J. (2020) 'Effect of handler knowledge of the detection task on canine search behaviour and performance', *Frontiers in Veterinary Science*, 7.
- DeMatteo, K.E., Davenport, B. & Wilson, L.E. (2019) 'Back to the basics with conservation detection dogs: fundamentals for success', *Wildlife Biology*, 2019(1), pp. 1–9. doi: 10.2981/wlb.00584.
- Dematteo, K.E., Rinas, M.A., Sede, M.M., Davenport, B., Argüelles, C.F., Lovett, K. & Parker, P.G. (2009) 'Detection dogs: an effective technique for Bush dog (*Speothos venaticus*) surveys', *Journal of Wildlife Management*, 73(8), pp. 1436–1440.
- Domínguez del Valle, J., Cervantes Peralta, F. & Jaquero Arjona, M.I. (2020) 'Factors affecting carcass detection at wind farms using dogs and human searchers', *Journal of Applied Ecology*, 57(10), pp. 1926–1935.
- Goodwin, K.M., Engel, R.E. & Weaver, D.K. (2010) 'Trained dogs outperform human surveyors in the detection of rare spotted knapweed (*Centaurea stoebe*)', *Invasive Plant Science and Management*, 3(2), pp. 113–121.
- Glover, N.J., Wilson, L.E., Leedale, A. & Jehle, R. (2023) 'An experimental assessment of detection dog ability to locate great crested newts (*Triturus cristatus*) at distance and through soil', *PLOS ONE*, 18(6).
- Grimm-Seyfarth, A. (2022) 'Environmental and training factors affect canine detection probabilities for terrestrial newt surveys', *Journal of Veterinary Behavior*, 57, pp. 6–15.



WILDLIFE DETECTION DOGS FOR ECOLOGICAL SURVEYS AND CONSERVATION RESEARCH: UK GOOD PRACTICE GUIDELINES
 Grimm-Seyfarth, A., Harms, W. & Berger, A. (2021) 'Detection dogs in nature conservation: A database on their world-wide deployment with a review on breeds used and their performance compared to other methods', *Methods in Ecology and Evolution*, 12, pp. 568–579.

Gutzwiller, K.J. (1990) 'Minimizing dog-induced biases in game bird research', *Wildlife Society Bulletin*, 18, pp. 351–356.

Hollerbach, L., Heurich, M., Gahbauer, M., Jessl, E., Reiners, T.E., Cocchiararo, B., Jüngling, H., Tiesmeyer, A., Jokisch, S. & Nowak, C. (2018) 'Of (s)cats and dogs: Detection dogs allow for systematic non-invasive collection of DNA samples of Eurasian Lynx (*Lynx lynx*)', in *Wildlife Detection Dog Workshop*, IZW, Berlin.

Homan, J.H., Linz, G. & Peer, B.D. (2001) 'Dogs increase recovery of passerine carcasses in dense vegetation', *Wildlife Society Bulletin*, 29, pp. 292–296.

Kerley, L.L. (2010) 'Using dogs for tiger conservation and research', *Integrative Zoology*, 5(4), pp. 390–396. doi: 10.1111/j.1749-4877.2010.00217.x.

Lehnert, M.P. & Weeks, E.N.I. (2016) 'Trained dogs in insect detection', in Jezierski, T., Ensminger, J. & Papet, L.E. (eds.) *Canine Olfaction Science and Law: Advances in Forensic Science, Medicine, Conservation, and Environmental Remediation*. CRC Press, pp. 321–333.

Leigh, K.A. & Dominick, M. (2015) 'An assessment of the effects of habitat structure on the scat'. (Incomplete reference—journal not provided.)

Lit, L., Schweitzer, J.B. & Oberbauer, A. (2011) 'Handler beliefs affect scent detection dog outcomes', *Animal Cognition*, 14, pp. 387–394.

Long, R.A., Donovan, T.M., Mackay, P., Zielinski, W.J. & Buzas, J.S. (2007) 'Effectiveness of scat detection dogs for detecting forest carnivores', *Journal of Wildlife Management*, 71(6), pp. 2007–2017. doi: 10.2193/2006-230.

Mackay, P., Smith, D.A., Long, R.A. & Parker, M. (2008) 'Scat detection dogs', in Long, R.A., Mackay, P., Ray, J. & Zielinski, W. (eds.) *Non-invasive Survey Methods for Carnivores*. Island Press, Chapter 7.

McLean, I. & Sargisson, R. (2005) 'Environmental determinants of landmine detection by dogs: findings from a large-scale study in Afghanistan', *Journal of Conventional Weapons Destruction*, 16(2), Article 32.

Mörén, L., Bergström, F., Brantlind, M. & Wingfors, H. (2022) 'Rapid changes in profiles from stored materials used in scent training of explosive detection dogs', *Science & Justice*, 62(5), pp. 657–665.

Orkin, J.D., Yang, Y., Yang, C., Yu, D.W. & Jiang, X. (2016) 'Cost-effective scat-detection dogs: unleashing a powerful new tool for international mammalian conservation biology', *Scientific Reports*, 6, article 34758.

Osterkamp, T. (2020) *Detector dogs and scent movement: How weather, terrain and vegetation influence search strategies*. CRC Press, Boca Raton, FL.

Paula, J., Costa Leal, M., Silva, M.J., Mascarenhas, R., Costa, H. & Mascarenhas, M. (2011) 'Dogs as a tool to improve bird strike mortality estimates at wind farms', *Journal for Nature Conservation*, 19, pp. 202–208.

Powers, R.M. (2018) 'Detection dogs as ambassadors and field assistants to protect imperilled reptiles and amphibians', in Richards, N. (ed.) *Using Detection Dogs to Monitor Aquatic Ecosystem Health and Protect Aquatic Resources*. Palgrave Macmillan, Cham.

Reed, S.E., Bidlack, A.L., Hurt, A. & Getz, W.M. (2011) 'Detection distance and environmental factors in conservation detection dog surveys', *Journal of Wildlife Management*, 75(1), pp. 243–251.



WILDLIFE DETECTION DOGS FOR ECOLOGICAL SURVEYS AND CONSERVATION RESEARCH: UK GOOD PRACTICE GUIDELINES
 Rolland, R.M., Hamilton, P.K., Kraus, S.D., Davenport, B., Gillett, R.M. & Wasser, S.K. (2006) 'Faecal sampling using detection dogs to study reproduction and health in North Atlantic right whales (*Eubalaena glacialis*)', *Journal of Cetacean Research and Management*, 8(2), pp. 121–125.

Rust, L., Nizio, K.D. & Forbes, S.L. (2016) 'The influence of ageing and surface type on the odour profile of blood-detection dog training aids', *Analytical and Bioanalytical Chemistry*, 408, pp. 6349–6360.

Smith, D.A., Ralls, K., Hurt, A., Adams, B., Parker, M., Davenport, B., Smith, M.C. & Maldonado, J.E. (2003) 'Detection and accuracy rates of dogs trained to find scats of San Joaquin kit foxes (*Vulpes macrotis mutica*)', *Animal Conservation*, 6, pp. 339–346.

Stanhope, K. & Sloan, V. (2019) 'Proposed method and accreditation of great crested newt detection dogs', *CIEEM In Practice*, 105, pp. 36–40.

Tirmenstein, D. & Freedline, R. (2018) 'Water search overview: Searching with dogs in an aquatic environment', in *Using Detection Dogs to Monitor Aquatic Ecosystem Health and Protect Aquatic Resources*. Springer International Publishing, Cham, pp. 1–23.

Wasser, S.K., Davenport, B., Ramage, E.R., Hunt, K.E., Parker, M., Clarke, C. & Stenhouse, G. (2004) 'Scat detection dogs in wildlife research and management: application to grizzly and black bears in the Yellowhead Ecosystem, Alberta, Canada', *Canadian Journal of Zoology*, 82(3), pp. 475–492. doi: 10.1139/Z04-020.

Woollett (Smith), D.A., Hurt, A. & Richards, N.L. (2014) 'The current and future roles of free-ranging detection dogs in conservation efforts', in Gompper, M.E. (ed.) *Free-Ranging Dogs & Wildlife Conservation*. Oxford University Press, pp. 239–264.

