Possessing great crested newts for the purpose of detection dog training

Guidance document to inform licensing

Natural England, Natural Resources Wales and NatureScot

August 2023

Notice

This document has been prepared and is intended solely as good practice guidance for Natural England, Natural Resources Wales and NatureScot in relation to great crested newt licensing.

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The information which the ADDC has provided has been prepared by detection dog and environmental specialists. The ADDC confirms that the opinions expressed are our true and professional opinions.

The authors are grateful to members of the global ADDC, the Amphibian and Reptile Conservation Trust, Natural England and NatureScot for comments on a draft version of this document.

This document does not purport to provide legal advice.

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1. Standing advice objectives

1.1. The Advisors for the Use of Detection Dogs in Conservation (ADDC) has produced this guidance document specifically for Natural England, Natural Resources Wales and NatureScot, the governing bodies for great crested newt licensing in the United Kingdom (UK).

1.2. **This guidance document is intended to inform licensing decisions in relation to possessing great crested newts for the purpose of detection dog training.**

1.3. The document has been produced by UK based board members of the ADDC. For information on individual authors of the document please refer to Appendix A.

1.4. Members of the ADDC include experienced wildlife detection dog handlers and advocates including researchers and ecologists located in the UK and worldwide. The ADDC provides a global advisory service to help ensure high quality conservation detection dog training and handling standards are achieved and maintained, with a focus on the welfare of detection dogs and target species. Further information on the ADDC can be found on the ADDC website[1].

1.5. A simple checklist for governing bodies determining licence applications is provided in Appendix B. A summary flowchart outlining the steps to becoming a great crested newt detection dog handler is provided in Appendix C.

2. Introduction

2.1. In the UK the great crested newt *Triturus cristatus* is afforded the highest level of protection under European (Regulation 41 of the Conservation of Habitat and Species Regulations 2010; Annex 4 of the Fauna, Flora and Habitat (FFH Directive) and UK (Section 9 of the Wildlife and Countryside Act 1981) legislation. As a result, this species receives considerable attention concerning activities that may impact their local population status, particularly those associated with local developments or large infrastructure projects. Methods used to capture and relocate individuals during their terrestrial phase from the proposed area of impact is therefore required as well as the creation of suitable terrestrial and aquatic habitat.

2.2. Like most bi-phasic amphibian species, the terrestrial lifecycle of a great crested newt is largely unknown (Jehle *et al*., 2011). Research based on radio and fluorescent pigment-tracking have found that great crested newts are not only found under surface refugia but can largely be found in subterranean refugia and may become stationary during warm or cold periods due to being cold blooded and being prone to desiccation (Jehle *et al*., 2011; Jehle 2000; Jehle and Arntzen 2000; Matos *et al*., 2017).

2.3. Current methods used to locate great crested newts during the terrestrial phase include radio tracking, passive integrated transponder tagging, pitfall trapping, fluorescent paint, hand-searching, torch light searches at night, and refugia searches. Some of the methods mentioned above are reliant on invasive procedures, capturing great crested newts to apply paint, tags or tracking devices to the individuals. Other methods are reliant on optimal climatic conditions to encourage movement at night by great crested newts resulting in a potential encounter with a pitfall trap or being spotted by torchlight in open habitat. Refugia searches of rocks, log piles and hand-searching can take considerable time with limited finds, particularly if great crested newts are located below ground. Current methods are therefore considered restricted and can be ineffective as well as being influenced heavily by climatic conditions (Jehle 2000; Jehle and Arntzen 2000; Kupfer and Kneitz 2000; Jehle and Hodi 1998; Latham and Knowles 2008; Matos et al., 2019; Briggs et al., 2006; Langton et al., 2001; Jarvis 2016; English Nature 2001).

2.4. Research trials are currently being conducted and have so far highlighted that dogs are able to detect great crested newts at distance, through soil, as well as being a faster and more effective method than conventional tools such as hand-searching and pitfall trapping (Grimm-Seyfarth 2022; Glover 2019, 2020, 2021, 2022). The utilisation of wildlife detection dog teams as an additional or standalone method to locate great crested newts has, therefore, become a desirable method for ecologists, developers and conservationists. Currently operational great crested newt detection dog teams used as part of mitigation methods have undertaken final checks before construction

[1] Home - ADDC (theaddc.org)

activities occur, locate great crested newts before fencing has been installed and removed, used to replace standard methods such as pitfall trapping and hand-searching, and used prior to destructive searches of scrub and refugia such as stone and log piles.

2.5. Depending on the breed, a dog's sense of smell is estimated to be 10,000 to 100,000 times better than that of humans (https://www.pbs.org/wgbh/nova/article/dogs-sense-of-smell/), corresponding to a relative area of the brain for olfactory processing which is about forty times larger (Craven *et al*., 2007). As a result, the performance of professional detection dogs in wildlife search tasks is generally 4-12 times better than that of experienced human surveyors, which in contrast to detection dogs predominately rely on visual and/or auditory cues (Long *et al*., 2007; Smith *et al*., 2001; Homan *et al*., 2001; Arnett 2006; Paula *et al*., 2011). At present, projects involving detection dogs have only been conducted on a small number of amphibian species globally (e.g. North American salamanders: *Amystoma californiense, Plethodon neomexicanus*; South African giant bull frogs *Pyxicephalus adspersus*, Australian Baw Baw frog *Philoria frosti*; Rose's mountain toadlet *Capensibufo rosei;* great crested newt and smooth newt *Lissotriton vulgaris* (Grimm-Seyfarth 2022; Shields and Austin 2018; Powers 2018 and Matthew *et al*., 2020; Hudson *et al*., 2023). In the UK the use of wildlife detection dog teams in conservation is within its infancy, therefore uncertainty and cautiousness has rightly been exhibited by governing bodies when determining licence applications to possess great crested newts for the purpose of detection dog training.

2.6. Research on the effectiveness of amphibian detection by dogs, specifically for great crested newts, is steadily expanding across Europe. Grimm-Seyfarth (2022) discovered that great crested newts have a small scent profile with a detection distance of around 20cm, this distance can fluctuate dependant on temperature, humidity, vegetation density, length of search, search type and even the sex of the newt (with males considered to emit a larger scent profile than females). Detection dog teams have also been found to be successful at detecting great crested newts through two contrasting soil types (sandy and clay soil) at 20cm belowground. The soil type can influence the detectability accuracy (Glover 2021, Glover 2022). Detection dogs are also able to reliably discriminate between great crested newts and other native amphibian species (Glover 2020; Glover 2022, Sloane 2019a, Sloane 2019b, Sloane 2019c, Stanhope and Sloane 2019).

2.7. Using live target species is essential when training detection dogs. Methods such as swabs have proven to be ineffective as the dog is trained to locate residual scent as opposed to live target odour (Grimm-seyfarth 2022). At the time of writing this document, the use of captive great crested newts is the most effective method available to train wildlife detection dogs. Governing bodies in the UK have therefore received a surge in the number of licence applications to keep captive great crested newts to train detection dogs.

2.8. This heightened interest in the use of detection dogs to locate great crested newts is likely linked to costs and time constraints associated with current methods to locate this species as part of mitigation measures, conservation efforts and research. The use of wildlife detection dog teams is also growing globally, and their success has been showcased through media platforms and releases of scientific papers (Long *et al*., 2007; Smith *et al.,* 2001; Homan *et al*., 2001; Arnett, 2006; Paula *et al*., 2011; Cablk and Heaton 2006; Browne 2005; Bearman-Browne *et al.,* 2020).

2.9. Research and documents returned to governing bodies as part of licence conditions for operationally deployed detection dogs, is showing the potential that great crested newt detection dog teams can have for assisting in mitigation, research, and conservation efforts. However, the effectiveness of the detection dog and handler team is dependent on the training implemented before operational deployment as well as the experience and knowledge of the handler (DeMatteo *et al*., 2019) and requires that certain standards of operation be obtained before deploying.

3. Great Crested Newts

Ecology

3.1. Great crested newts rely on waterbodies for breeding but, in most instances, spend most of their lives in terrestrial habitats. The annual activity pattern of mature great crested newts is relatively simple: after hibernation on land, individuals migrate to waterbodies where they reproduce. After reproduction has taken place, they generally return to terrestrial habitats where they forage and shelter until hibernating (Jehle *et al*., 2011).

3.2. Some mature great crested newts commence migration to their breeding ponds as early as the first frost-free days, with most great crested newts reaching their waterbodies by mid-March. The timing of migration is influenced by evening temperatures and precipitation, with most movement occurring when the air temperature is above 5°C and conditions are wet or damp (English Nature, 2001). Great crested newts generally migrate during the hours of darkness to avoid predation and desiccation.

3.3. Depending upon seasonal conditions reproduction usually takes place between mid-March and mid-June. During this period, males attract females by undertaking a courtship display which may result in the female taking up the male's spermatophore into her cloaca (English Nature, 2001). Following this, the female will lay approximately 200 eggs over a period of several weeks (English Nature, 2001), individually wrapping each egg into leaves of submerged plants or other pliable materials (including discarded waste such as plastic bags and food wrappers). Mature great crested newts generally leave the breeding waterbodies from late May onwards although this dispersal is gradual, and individuals may occasionally return to waterbodies to forage (English Nature, 2001).

3.4. Under favourable conditions, great crested newt larvae will hatch after approximately three weeks and then take another two to three months to complete larval development (English Nature, 2001). This development is highly dependent upon the conditions within the waterbody (e.g. water temperature and food availability). Great crested newt larvae feed on a range of prey including fly larvae, tadpoles, and other newt larvae. Once larvae undergo metamorphosis, they emerge from their waterbodies over a period of approximately two months starting in early August (depending upon seasonal conditions). However, some great crested newt larvae may overwinter in for example shaded waterbodies until the following year where water temperatures are sub-optimal for development or where food availability is limited. Most immature great crested newts will spend the next two to four years living in terrestrial habitats, occasionally visiting waterbodies, until they reach sexual maturity and seek waterbodies to breed (English Nature, 2001).

3.5. Whilst in the active terrestrial phase, great crested newts seek refuge during the day in habitats that provide protection from predators and protection from exposure to adverse weather conditions. These habitats often include rank grassland and dense vegetation, discarded debris, log and rubble piles, and deadwood. Great crested newts hibernate in habitats that provide protection from frost and flooding. These habitats often include rubble piles, dry stone walls, discarded materials, deadwood, underground cracks and crevices amongst tree roots and mammal burrows. Hibernation takes place following the first few days of frost or when evening temperatures are consistently below 5°C, generally from October onwards. Hibernation will then persist until the first frost free days the following year or when temperatures are consistently above 5°C.

3.6. Great crested newts can move over considerable distances (up to 1.3km from breeding sites), although most great crested newts will utilise an area much closer to their breeding waterbodies (English Nature, 2001). Great crested newts often form a metapopulation, where individuals move within a network of waterbodies, seeking the most suitable foraging areas or breeding sites which may differ in suitability between years. Small, isolated great crested newt populations that are reliant on a single waterbody are less likely to persist in the long term (English Nature, 2001).

3.7. Great crested newts can live for over 15 years, although the majority will survive only a few years past sexual maturity. Juvenile great crested newts generally outnumber mature great crested newts in a population (Jehle *et al*., 2011).

Legislation

3.8. Table 3-1 and Table 3-2 detail the legislation in place for great crested newts in England, Wales and Scotland, along with details of offences and licensing procedures and guidance. Current legislation prohibits disturbance of great crested newts (including for the purpose of detection dog training) without an appropriate licence.

Table 3-1: Great crested newt legislation in England and Wales

Legislation	Offences	Licensing procedures and guidance
Conservation of Habitats and Species Regulations 2017 (as amended) Regulation 43	Deliberately[2] capture, injure, or kill a great crested newt; deliberate disturbance[3] of a great crested newt; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by Natural England (in England) and Natural Resources Wales (in Wales) Guidance documents: *NE Standing Advice for protected species 2022* *European Protected Species: Mitigation Licensing- How to get a licence* (NE 2013) *Great Crested Newt Mitigation Guidelines* (English Nature 2001)
Wildlife and Countryside Act 1981 (as amended) Section 9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb[4] a great crested newt in such a place.	Licences issued for science (survey), education and conservation by Natural England (in England) and by Natural Resources Wales (in Wales). The Environment Act 2021 received Royal Assent in November 2021. Section 111 of the Environment Act introduces changes, in England, to the Wildlife and Countryside Act 1981 (as amended). This includes the introduction of the 'overriding public interest' purpose for Species covered under section 16(3). Future projects, in England, will now need to be licensed by Natural England to cover both the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). At the time of writing, Natural England are planning to create a single mitigation licence application form to cover both legislations.

[2] Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing

[3] Deliberate disturbance of animals includes any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to significantly affect the local distribution or abundance of the species to which they belong.

[4] Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 (as amended) remain an offence under the Wildlife and Countryside Act 1981 (as amended) although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

Table 3-2: Great crested newt legislation in Scotland

Legislation	Offences	Licensing procedures and guidance
Conservation (Natural Habitats, & c.) Regulations 1994 (as amended) Regulation 39	Deliberately or recklessly capture, injure or kill a great crested newt; disturb a great crested newt while it is occupying a structure or place used for shelter or protection; obstruct access to a breeding site or resting place, or otherwise deny great crested newt the use of the breeding site or resting place; disturb a great crested newt in a manner or in circumstances likely to (i) significantly affect the local distribution or abundance of the species; or (ii) impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; take or destroy the eggs of such an animal. Damage or destroy a great crested newt breeding site or resting place [note that this does not need to be deliberate or reckless to constitute an offence].	Licences for development are issued by NatureScot. Guidance documents: NatureScot Standing Advice: https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/protected-species-z-guide/protected-species-amphibians-and-reptiles

Sourcing great crested newts

3.9. It is important to keep both male and female great crested newts for training purposes in case the sexes provide different olfactory cues to detection dogs.

3.10. When sourcing great crested newts from the wild for training purposes, it is necessary to obtain landowner permission and have a science and education licence from the relevant governing body which covers this activity. Great crested newts should be retrieved from within the same metapopulation to minimise the biosecurity risk (refer to Biosecurity section). Taking great crested newts from a small population or an isolated population should not be permitted since removing individuals could have a significant impact on breeding success in any given year. A recent (within the last two years) population size class assessment should be available for the capture site to confirm that there is either a medium or large population size present; a minimum of four great crested newts should be taken in order to reduce the handling time of individual great crested newts during training and no more than 10% of the total peak population count should be taken for the purpose of detection dog training.

3.11. Great crested newts should only be taken during the active period (which is generally 15 February to 31 October, depending on seasonal conditions). Adult and juvenile great crested newts of either sex may be taken, except for gravid females (adult females are likely to be gravid in the active season from February until the end of June) or small juveniles. Small juveniles are defined as those individuals lacking ventral black spots or patterns, and/or animals smaller than 50mm in length (from the nose to cloaca).

3.12. Capture should take place from terrestrial habitats (e.g. via capture from under carpet tiles and other refugia). In case of problems sourcing enough individuals from terrestrial habitats, netting and/or bottle trapping within waterbodies can be undertaken by a licensed great crested newt surveyor to capture additional individuals (refer to Captivity section for specific requirements as

great crested newts captured from aquatic habitats will be more prone to desiccation). Any gravid females or small juveniles should be returned immediately to ponds and not held captive.

3.13. All great crested newts taken should be held in accordance with the Captivity and Biosecurity sections. All great crested newts temporarily possessed should be released at their original capture site no later than 30 April following the calendar year in which the individuals were originally taken from the wild. Belly markings should be recorded, using a camera, to avoid taking the same individuals in subsequent captures.

Captivity

3.14. Keepers (those housing the great crested newt) should propose to set up a secure and comfortable enclosure(s) for captive great crested newts in the form of a vivarium. The vivarium should have a secure tight-fitting lid with no escapable holes and be well ventilated. The size of the vivarium will depend on the number of great crested newts kept in captivity for example six adult great crested newts kept in captivity will require a tank with a floor space of 100cm length (l) x 50cm width (w) and 35cm height (h). A floor space of 60cm (l) x 30cm (w) is considered large enough to house at least four adult great crested newts (Fahrbach and Gerlach 2018), this will likely be the minimum number of great crested newts an applicant will request to keep in captivity.

3.15. Humidity levels of 80% and more is recommended for urodele species such as the great crested newt kept in terrestrial captive setups (Pasmans et al. 2014; Fahrbach and Gerlach 2018). This can be achieved by regularly misting the vivarium (Fahrbach and Gerlach 2018). Levels of misting should be monitored alongside drainage of the tank to ensure that misting doesn't result in the accumulation of water which can lead to fungal infections and general poor health of the newts. Fahrbach and Gerlach (2018) suggest misting the enclosure once a week. Conversely, the substrate base of the enclosure must not be too dry, which can result in newts becoming dehydrated (Fahrbach and Gerlach 2018). The keeper must therefore use a substrate that provides a suitable moisture gradient (Fahrbach and Gerlach 2018). The type of substrate and level of moisture will depend on where the newt was captured from and the season. For instance, those captured during the spring will require more moist conditions than those caught terrestrially during the summer or autumn months. This is due to their skin changing throughout the season (Jehle et al., 2011). Substrate recommendations from captive crested newt keepers include loamy soil, bentonite, gravel, foam rubber and kitchen towel (Fahrbach and Gerlach 2018). An abundance of live moss, leaf litter, logs and bark for individuals to hide is also recommended. A container holding rainwater should be placed inside the tank, with easy ingress and egress for newts to move freely between the substrate and water. The use of tap water should be avoided as this can damage the newts' skin over prolonged periods (Fahrbach and Gerlach 2018) and potentially change their odour.

3.16. The ratio of water to land supplied within the vivarium will be dependent on the time of year the great crested newts have been captured and where they have been captured from. For instance, great crested newts captured during springtime should have ratio of 70/30 water to land whereas great crested newts captured during summer and autumn period will be largely terrestrial and the ratio can be reduced to 30/70. Great crested newts captured aquatically can have the ratio reduced gradually over time to encourage the newts to become terrestrial, this should be done gradually over a few weeks and the keeper should observe how long the newts spend terrestrially and aquatically and adjust accordingly (Fahrbach and Gerlach 2018).

3.17. Although great crested newts are known to live together in large numbers terrestrially (Jehle et al., 2011), it is recommended no more than six are kept together in one tank to minimise food competition and potential aggression. Great crested newts will also benefit from being kept in pairs and small colonies to reduce stress levels, therefore keeping single individuals should be avoided where possible. Great crested newts can be kept with same sex and mixed sexes in captivity, although the keeper should regularly observe the newts for any signs of suffering from the company of conspecifics. If any signs of aggression or food competition have been noted and condition of individuals worsens then they should be separated (Fahrbach and Gerlach 2018). The keeper should keep additional tanks for this eventuality.

3.18. The tank should be kept light in the day but cool, not in a room with central heating or direct sunlight. Temperatures should be kept between 8 and 15 degrees Celsius (Fahrbach and Gerlach 2018). If great crested newts are kept over the winter, the temperature should be stabilised between this range to prevent them from going into hibernation.

3.19. A consistent supply of varied food should be supplied to the great crested newts to emulate their natural prey sources including (but not limited to); earthworm, house mosquito larvae, red mosquito larvae, glassworms or white mosquito larvae, daphnia, waxworms, tibifex, blackworms, potworms, caddisfly larvae, crickets, woodlice, small slugs, grasshoppers, small spiders, fruit flies, springtails Mealworms can be used during warm periods when other native invertebrates are hard to locate. Mealworms can be fed live, although they are known to eat decaying flesh from injured animals, therefore they should not be used as a food source until a health check has been performed. Mealworms can be decapitated and fed to the newts, although some newts may not take deceased food. Any dead food should be removed daily.

3.20. The licence application or supporting documents to possess great crested newts in captivity should stipulate the length of stay, including whether over the spring/summer months and released before hibernation, or kept over the hibernation period and released in the spring.

3.21. Individual newts should be given two weeks to assimilate following capture before training commences to allow them to adapt to captivity. If possible, great crested newts should be kept for no more than one active season and swapped with other great crested newts so they can return to their natural environment; this also increases the scent pool that the dog has access to.

3.22. Although not essential it is advantageous if the applicant has had experience keeping other temperate amphibians (such as the marbled newt *Tritutus marmoratus*) so they understand the requirements. Pet amphibians will need to be removed from the premises before great crested newts arrive due to biosecurity risks. Please see Table 3-3 for more information.

3.23. Depending on their captive newt experience, it is recommended that the keeper has contact with specialists who have experience keeping crested newts in case any issues arise.

Welfare

3.24. The welfare of captive and wild great crested newts should be paramount during detection dog training. The applicant should be able to identify stress signals exhibited by great crested newts through daily observations for (but not limited to):

- Weight loss (weights should be recorded weekly);
- Unken reflex;
- Foaming around the neck region and flanks;
- Rigid and bent over to one side;
- Any injuries;
- Potential signs of diseases such as excessive skin shedding and skin ulceration.

3.25. If applicants notice any of the above signs, they should stop training immediately. If the conditions persist or it is likely the great crested newt is carrying a disease, they should isolate the great crested newt from others and contact a crested newt specialist within the field for further advice. The relevant governing body should be notified immediately if any great crested newts are released due to welfare reasons.

3.26. Training should not take place outside in extreme weather conditions such as strong wind, lightening, excessively heavy rain and heat. Training should only take place when temperatures are between 5 and 25 degrees Celsius. Depending on the training type (such as whether the newts are at depth, on the surface, in containers), length of training time should be limited for each great crested newt to minimise stress and the health of the great crested newt should be monitored with length of training altered accordingly. Containers containing great crested newts should be placed out of direct sunlight, particularly those that retain heat such as tin, and when cloud cover is minimal (below 50% coverage). Containers comprising natural material such as wood are recommended or those that maintain moisture. Great crested newts should be sprayed with rainwater when kept in containers to avoid desiccation.

3.27. Individual great crested newts should be used for training purposes for no longer than 30 minutes up to twice a day with a minimum three hour break between the training periods. This is to limit stress and ensure the continued welfare of individual newts. Training time should be reduced for any great crested newts taken directly out of aquatic waterbodies as they are prone to drying out at a greater rate. Training with individuals should only be undertaken four out of seven days, which equates to a maximum of four hours for each individual per week. Individuals should have at least three days a week without being disturbed. Training time should be logged by applicants and presented to governing bodies on request.

3.28. The detection dog should be trained to avoid entering waterbodies as this could have a negative impact on wildlife such as disease transmission, damage to aquatic plants and animals, damage to fertile eggs, and disturbance during breeding. The welfare of the detection dog should also be considered as consumption of untreated water may have toxic algae or other potential diseases or toxins present, resulting in death to the dog or ill health.

3.29. The welfare of the great crested newt may suffer if kept in captivity for long periods of time, through lack of breeding, mobility, and ability to hunt on their own. The licence application or supporting documents should therefore stipulate a length of time for captivity with the welfare of the great crested newts in mind. It is recommended that captive newts should miss only one breeding season. Other individuals can be captured the following season replacing those that have been returned to the wild. Pictures of belly patterns should be taken to prevent recapture within a three-year period.

Biosecurity

3.30. Method statements submitted with the licence application will need to consider biosecurity measures to minimise the spread of diseases such as chytrid, *Batrachochytrium dendrobatidis* (Bd) and *B. salamandrivorans* (Bsal). These are microscopic fungi that cause a lethal skin disease (chytrid disease) in amphibians, mainly affecting salamanders and newts, including great crested newt. Bsal has caused mass mortalities in wild salamanders in Belgium, Germany, the Netherlands, and Spain and is considered a major threat to amphibian biodiversity. In Great Britain, it has been recorded in captive populations of amphibians but not yet in wild populations. It does not affect humans. Bsal is a notifiable animal disease and must be reported to the Defra Rural Services Helpline. Failure to do so is an offence. More information can be found at https://www.gov.uk/guidance/batrachochytrium-salamandrivorans.

3.31. Training detection dogs to locate great crested newts will involve holding captive great crested newts, the use of a variety of containers and interacting with different populations which will potentially result in exposure and aiding the transmission of diseases. Governing bodies should consider the risks of the applicant spreading diseases and what measures they have put in place to minimise spread. Table 3-3 provides example scenarios that may result in transfer of diseases and suggested mitigation as well as advice notes to follow to reduce spread of diseases during training activities Please note this does not cover every risk encountered during the training process.

Table 3-3: Biosecurity considerations, risks and mitigation

Activity	Biosecurity risks	Examples to mitigate risks*	Resources/further information
RISKS ASSOCIATED WITH CAPTURING NEWTS			
Entering/exiting a site	Potential to transfer diseases through equipment and footwear.	Do not capture newts from sites with known records of diseases. All Personal Protective Equipment (PPE) and equipment must be clean before entering a site. Great crested newts to be captured from one site only to avoid disease transfer between sites. Ensure all equipment and PPE is washed thoroughly using an appropriate disinfectant before and after a site visit. Wash all clothing on a 40°C cycle with biological detergent, after exposure to	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file

Activity	Biosecurity risks	Examples to mitigate risks*	Resources/further information
		amphibians, soil, or pond water. Keep number of visits to the site to a minimum where necessary. Minimise the number of assistants present onsite.	
Capturing great crested newts with carpet tiles/ bottle traps/pitfall traps etc	Potential transfer of diseases through equipment.	Use field equipment dedicated on the site only. Store the equipment onsite where possible. Ensure that all participants thoroughly scrub and disinfect footwear before going on site. Ensure all equipment is thoroughly disinfected when leaving a site. Ensure that all participants wash hands thoroughly with soap or hand sanitising gel and water after handing newts and materials which have been in contact with newts.	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file
Handling amphibians onsite	Transfer diseases through contact with skin.	Wear powder-free biodegradable vinyl gloves. Use a fresh pair of gloves for each site visited (or on larger sites between different areas). Do not take the newt offsite unless licence permits. Put newt back in location found, or within proximity in safe refuge.	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file
Transporting great crested newt from the site	Transfer of diseases through vessel.	Make sure vessel used to transport great crested newt is new or thoroughly cleaned with a suitable disinfectant. Great crested newts should only be transported with other newts taken from the same population. Substrate used in the vessel should be taken from the captive site.	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file
RISKS ASSOCIATED WITH KEEPING CAPTIVE NEWTS			
Proposals to keep more than one population of great crested	High risk of potential spread of disease between	Only individuals from same population recommended to be kept in captivity at one premises. If keeping more than one population,	Garden Wildlife Health (GWH) scheme Amphibian Disease Alert:

Activity	Biosecurity risks	Examples to mitigate risks*	Resources/further information
newt captive at one premises.	captive populations if kept in same tank. If kept separately possible spread through handling and feeding and being placed in containers for training. Risk of captive population transferring diseases to wild population when released.	the licence applicant should clearly demonstrate how they will minimise transfer, e.g. kept in different locations in a building, gloves changed before handling, separate containers used for training. If using amphibians from more than one population then all individuals should be swabbed before being released to check for the presence of diseases.	Amphibian_Disease_Alert.pdf (gardenwildlifehealth.org) ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file
Using substrate	Risk of substrate and refugia transferring diseases if taken from site with a different population of amphibians.	Take substrate from capture site to minimise spread of disease or use treated substrate.	Garden Wildlife Health (GWH) scheme Amphibian Disease Alert: Amphibian_Disease_Alert.pdf (gardenwildlifehealth.org) ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file
Disposing of substrate	Risk of spreading disease from substrate to local amphibian populations.	Substrates (e.g. soil, sand, gravel) can harbour infections so should be sent for incineration by a registered company that can dispose of clinical waste (e.g. those used by veterinary practices). If this is not possible, substrates should be disinfected, desiccated, or heat-treated before being disposed of with household refuse for collection by your local council.	Garden Wildlife Health (GWH) scheme Amphibian Disease Alert: Amphibian_Disease_Alert.pdf (gardenwildlifehealth.org)

Activity	Biosecurity risks	Examples to mitigate risks*	Resources/further information
Non-native amphibians	Risk of spreading disease from other pet amphibians to wild great crested newts. Captive amphibians can carry a variety of diseases and housing non-native amphibians with temporary captive population will pose a major risk.	Any non-native or native captive amphibians must be temporarily or permanently rehomed before wild great crested newts are temporarily housed at the premises. No tanks/ substrate/ containers or any form of equipment used to house non-native/captive individuals must be used with the great crested newts taken into captivity. The premises must be thoroughly disinfected before great crested newts arrive to prevent any chance of disease transfer.	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file Garden Wildlife Health (GWH) scheme Amphibian Disease Alert: Amphibian_Disease_Alert.pdf (gardenwildlifehealth.org)
RISKS DURING TRAINING WITH CAPTIVE NEWTS			
Using containers	Potential to transfer diseases through containers if used for more than one population.	Containers are either separated for different populations or washed thoroughly using an appropriate disinfectant such as Virkon after use.	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file The 'Check, Clean, Dry' campaign:Check Clean Dry » NNSS (nonnativespecies.org)
No containers to be used	Risk of losing the great crested newt and spreading disease if training without containers at a different site than the newt was captured from.	Training should only be undertaken without containers in areas where the great crested newt(s) was captured from.	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file
RISKS ASSOCIATED WITH TRAINING WITH WILD POPULATIONS OF GREAT CRESTED NEWTS ON TRAINING SITES			

Activity	Biosecurity risks	Examples to mitigate risks*	Resources/further information
Moving between different training sites with great crested newts present	Potential to transfer diseases through equipment, footwear, dog coat and paws.	Avoid training at sites where amphibian diseases have been recorded. Have PPE specifically designated for that site. Training or use of lead should be undertaken to prevent dog from entering any waterbodies as this will increase chance of disease transmission as well as cause welfare implications to wildlife and potentially the detection dog. Avoid carrying out training at more than one site in one night to minimise direct transfer of diseases. Minimise number of training sites. Ensure all equipment, including dog and handler PPE, is washed thoroughly using an appropriate disinfectant before and after a site visit. Dogs' paws (if not covered) should be washed before and after each site visit. Dogs fur should also be groomed before and after each site visit. Wash all clothing including dog harness and boots on a 40°C cycle with biological detergent, after exposure to amphibians, soil, or pond water. Consider having two sets of field gear, so that one can be in the disinfection and drying process while the other is in use.	ARG-UK Advice Note 4 (version 2): https://www.arguk.org/downloads-in-pages/resources/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2/file The 'Check, Clean, Dry' campaign: Check Clean Dry » NNSS (nonnativespecies.org)

*Examples of most appropriate mitigation measures for the activity specified have been included; further measures and details can be identified in the 'Resources/further information' column.

4. Great Crested Newt Detection Dog Teams

Applicant experience

4.1. Handling wildlife detection dogs is complex as abiotic factors such as wind, rain, temperature, habitat complexity, and humidity can influence their target species scent movement as well as biotic factors such as target species ecology. A professional and experienced handler should understand how environmental factors can influence their target species scent movement and how to work with their dog to account for these factors. An individual that is inexperienced in handling detection dogs may miss vital signs within the field resulting in an ineffective search. The safety of the target species and the surrounding wildlife is paramount. Understanding issues surrounding biosecurity is also vital to prevent spread of diseases. Handlers should be aware of all these factors and should have the necessary experience (see section 4.4) before having their licence granted to possess great crested newts for the purpose of detection dog training.

4.2. It is considered likely that applicants applying for licences would range from ecologists with experience of working with great crested newts but minimal detection dog handling experience, to detection dog handlers and trainers with minimal experience of great crested newts.

4.3. Applicants with minimal experience of either dog handling or experience with great crested newts pose a risk to wildlife and their lack of knowledge and experience could mean that the great crested newt detection dog training, and subsequent operation, is undertaken to a poor standard.

Detection dog and handler experience

4.4. It is recommended that the named detection dog team (handler(s) and detection dog(s)) on the licence should have received training/mentoring from a reputable wildlife detection dog trainer (criteria for trainer explained in Section 4.7 below) before applying for a licence to possess great crested newts for the purpose of training detection dogs. This will involve the detection dog(s) being scent imprinted on a training odour, preferably with a small scent profile to mimic the difficult small scent profile of great crested newts (e.g. bedbugs or similar). The detection dog should learn to display a non-invasive indication (described below). The trainer should teach the detection dog team how to perform searches appropriate for great crested newt detection as well as performing searches in similar environments that great crested newts are likely to frequent with a variety of distractions.

4.5. The wildlife detection dog trainer should assess the detection dog team's qualities and whether they have the appropriate skills for great crested newt detection. The dog handler team should be proficient in the below before applying for the licence:

- Handler can prepare appropriate risk assessments as necessary.
- The dog does not chase wildlife and livestock.
- The dog performs a non-invasive and passive indication on their training odour. An alert that the dog performs without touching or disturbing the target species.
- The dog maintains focus around distractions (e.g. livestock, wildlife, traffic, machinery, people).
- The dog and handler can maintain a motivational search over a prolonged period whilst implementing breaks for dog welfare.
- Handler is able to assess environmental factors (e.g. wind, rain, temperature, humidity) and how this influences scent movement.
- Dog team can locate training odour in blind search scenarios in environments similar to where great crested newts will be located.
- Handler can read the dog's body language and change in behaviour.
- Detection dog team can work under pressure and within set timeframes.
- Detection dog team can perform an intricate search technique.
- Detection dog can work on and off lead.
- Detection dog can demonstrate recall.

4.6. The period of training time required will be dependent on a variety of factors including the time dedicated to training that the handler can commit to and how quickly they advance as a detection

dog team. It is recommended that the trainer signs off the handler once the handler has demonstrated the correct experience, knowledge, and basic skillset to start great crested newt detection dog training. An assessment form or form of reference should be submitted by the trainer with the licence application. Evidence of continued professional development, such as certificate of attendance, should also be submitted by the applicant with the licence along with a summary of courses attended, and detection work to date if operational in another detection dog field. A logbook detailing training undertaken is also recommended to be available if requested by the governing body.

Knowledge and experience with great crested newts

4.7. Those named under the licence to possess great crested newts for the purpose of training detection dogs should be able to demonstrate that they have a good knowledge of great crested newt ecology and experience of handling and working with them. They should be able to identify great crested newts from other amphibian species confidently as well as having a basic understanding of their terrestrial habitat.

4.8. The applicants' knowledge and experience should be clearly set out in their licence application and a reference should be provided from someone with a great crested newt survey licence. An applicant should ideally be registered on the appropriate survey licence (such as the *Great crested newts: survey or research level 1 licence (CL08)* administered by Natural England) for handling the great crested newts, although handlers who are not registered could alternatively work closely with those that are. This will need to be detailed within the method statement accompanying the licence application to capture and keep great crested newt.

4.9. Applicants keeping great crested newts in captivity will ideally have experience keeping amphibians in captivity or will work alongside someone who does have this experience, as this provides confidence in the welfare of the captive great crested newts.

Wildlife detection dog trainer credentials

4.10. The named handler on the licence should have sought training from a reputable wildlife detection dog trainer, this must be someone with experience in great crested newt or amphibian detection, although this may be difficult to source given limited number of trainers currently available. Wildlife detection dog trainers referenced in the licence must have relevant experience operationally within the wildlife detection dog field and, therefore, able to impart vital knowledge to their student to prepare them for great crested newt detection. Trainers within other industries such as the security industry, will unlikely have the appropriate knowledge and experience within the field and, therefore, are considered unlikely to be able to prepare handlers for the complexities involved in great crested newt detection. Examples of potential issues that could arise if an inexperienced trainer is used includes the following:

- Wrong dog selection for target species, causing damage to the surrounding vegetation and wildlife as well as death to the target species.
- Handler not having suitable qualities for great crested newt detection (e.g. determination, problem solving, working well under pressure).
- The detection dog team will present a potential threat to target species, wildlife, livestock, and people.
- Handler unable to perform search strategy and read dog behaviour resulting in an ineffective search.
- As well as out of date training methods as well as lacking up to date knowledge on the ecology of the species resulting in ineffective training protocols.

4.11. The above raises just a few issues that may arise if the trainer is not experienced within the conservation dog sector specifically, the dog and handler team are unlikely to be competent to carry out the task. This in turn will greatly affect the reputation and efficacy of wildlife detection dogs, making it more challenging for the detection dog team method to expand to assist more wildlife and conservation work. The trainer's credentials and experience should, therefore, be reviewed alongside the handler's credentials and experience to ensure they are able to train in such a specialist discipline in the field of conservation and ecology with past successes and projects to be referenced.

Training protocols

4.12. The licence application submitted to the governing body should include a detailed training plan to provide confidence that the dog/handler team will be trained appropriately, with sufficient risk assessments in place, before going operational. This chapter does not provide step-by-step details on how the training should be implemented, and training methods should be suited to the individual dog/handler teams. However, this chapter will highlight training areas that should be considered to ensure sufficient detection dog training is undertaken prior to operational deployment. The time taken for each phase cannot be specified as detection dog teams work and develop at different paces.

Scent imprinting

4.13. A dog should be taught to search for a training odour before adapting to great crested newt scent (if the dog has not previously been trained on detecting target odours). This allows a trainer to teach search techniques, and a passive indication (non-reactive and not destructive), which is critical when dealing with live animals. This training phase should be carried out with the trainer present, and this process should not be rushed.

4.14. Once the training moves onto the use of great crested newt, it should include the use of containers to protect great crested newts from potential harm during scent imprinting. Great crested newts should never be exposed during scent imprinting.

Exposure to great crested newts outside of containers

4.15. Once the detection dog is giving a passive indication on a great crested newt inside a container, individuals can be taken out of the container. This process should be undertaken cautiously, and the handler and trainer should monitor the dog behaviour very carefully, as this stage has the highest potential for injury of great crested newts. If the detection dog appears aggressive or invasive towards the great crested newt at any stage, training should stop immediately. This process can also initially be carried out by placing the newt in a container where the dog can see the newt but cannot gain direct access to it.

Vegetation searches

4.16. Once the detection dog is giving a passive indication and is safely performing a non-invasive indication to exposed individuals, great crested placed in a variety of habitats without containers to train the dog to search in a natural environment. This should be carried out at the newts' place of origin (for biosecurity reasons). Marking out search areas by, for example, digging shallow trenches is recommended. The size of the search area should be initially small (e.g. 5 m X 5 m), and increase over time. The complexity of the vegetation should also increase over time.

Detection at distance

4.17. Training the dog to recognise the scent of great crested newts at distance or in hard-to-reach places such as log and rock piles, is important. Safety of the great crested newt should be considered during this phase of training, to prevent injury if the applicant is placing the newt under refugia. The applicant should detail how they will prevent injury when carrying out this type of training.

Detection through substrate

4.18. Great crested newts can be found under a range of substrate and materials including leaves, moss, and soil. Such locations should be mimicked safely in training, to observe the dog's reactions. This process should consider the welfare of individual great crested newts which should be placed in safe containers (it is important that the dog must also be trained so the containers are not part of the target odour), or secure areas should be created to ensure that great crested newts are safe and cannot escape.

Detection at depth

4.19. This type of detection will need to mimic great crested newts located underground and will need to be carried out in a safe way. The great crested newts will need to be secured and easily accessed following completion of training if they are to return to captivity.

Discrimination

4.20. Detection dog behaviour can vary between individuals and some dogs may be more likely to generalise on non-target amphibian scent than others, where the dog will locate any amphibian rather than specifically great crested newt. Particularly if the detection dog has observed an emotional response from their handler or trainer to other amphibians located in the field. Tests to determine whether the dog has generalised can be undertaken in controlled environments such as

through line-ups or uncontrolled situations such as training on sites where other amphibian species are present and moving freely. If the detection dog has begun to generalise then training will need to be sought to clearly communicate to the dog that they should not be searching for general amphibians and should be searching for great crested newts only.

Interaction with wild great crested newts and different life stages

4.21. It is crucial that training involves exposure to great crested newts from more than one population and at different life stages. Exposure to different life stages and sexes is also important to prevent the dog targeting a specific stage or gender. Detection dogs that are only introduced to captive great crested newts are unlikely to have success with finding great crested newts from different locations due to possible changes in scent dependant on location and diet.

Handler behaviour

4.22. As the detection dog will be working as a team with the handler it is important that the handler behaviour is monitored during the training process by the trainer. Handlers can have a profound influence on the behaviour of the detection dog performance through body posture, vocal cues, bias, and nervous disposition. Therefore the suitability of the dog/handler team needs to be assessed during the training phase. The handler will need to be able to read the detection dogs changes in behaviour and work with the detection dog to locate the odour. Blind searches are therefore critical during the training phase to determine handler capabilities. Blind searches involve the odour being placed out without the dog/handler team knowing its location. These types of searches are only recommended once the detection dog is confident on the odour.

Trainer involvement

4.23. The trainer should continue monitoring the handler/dog teams' performance throughout the training process and should be present during the start of each phase to ensure the handler is implementing the correct training procedure. The trainer should plan regular visits with the handler through the course of the training, and when the trainer is satisfied with the detection dog/handler team progress, it is recommended that a third-party assessor should conduct an independent assessment.

Returning great crested newts to the wild

4.24. Following completion of temporary captivity, the applicant must provide details on how they are proposing to release the great crested newts back to the wild.

4.25. **Condition:** Great crested newts should be health checked and weighed before release to ensure they are in the same or greater body condition than when they were captured. As discussed within the welfare section, individuals should be weighed weekly and health checked during captivity to monitor condition.

4.26. **Time of year:** Depending on the longevity of captivity it is important that great crested newts are returned with enough time to acclimatise before cool temperatures results in inactivity. Therefore, newts should be returned to the wild in September at the latest to give the great crested newts at least 1-2 months of acclimatisation before temperatures fall. Release should always be undertaken during the active period and should avoid November to February.

4.27. **Time of day:** It is recommended that newts are released during the evening after sunset, so they have chance to choose their preferred place of refuge minimising chances of predation.

4.28. **Temperatures:** Newts should be released when temperatures are between 5 and 25 degrees Celsius, avoiding cold temperatures which may result in immobilisation or excessive heat which may cause desiccation.

4.29. **Weather conditions:** Ideally newts should be released on warm and wet evenings to allow hunting and movement to find suitable refuge.

4.30. **Location of release:** Newts should be released under refuge and should not be placed out in the open. They should be released close to their place of capture.

Report returns

4.31. Following completion of the licence period a report return must be submitted to the governing body detailing the following:

- Information on great crested newts captured including number caught, life stages, sex, dates captured, locations caught, method of capture and belly patterns taken of the individuals;

- Enclosure details;
- Diet during captivity;
- Weights recorded during captivity and health checks;
- Training log summarising all training protocols undertaken during licenced period, amount of training undertaken for each individual, locations of training, apparatus used;
- Information of great crested newts released including date released, time and locations;
- Information regarding any captive great crested newt fatalities and the reason(s) for fatalities;
- Assessment report from the trainer – must be signed and dated and include assessments of the dog handler team, progress, areas the team needs to work on, dates the trainer visited the dog handler team, number of training sessions undertaken together and confirmation from the trainer of whether the dog handler team is ready for assessment.

Assessment prior to operational deployment

4.32. The detection dog team is recommended to be assessed by a third-party assessor prior to operational deployment once the trainer deems the detection dog team is ready. This is to ensure the detection dog team are at an appropriate standard before working operationally to provide confidence in the governing body and clients procuring the detection dog team. Details on the assessments are under development by the ADDC. In the meantime please refer to the CIEEM In Practice 2019 article on the *Proposed method for testing and accreditation of great crested newt detection dogs* (Stanhope & Sloane, 2019) for suggested test procedures.

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Appendices

Appendix A. About the Authors

Aran Clyne

Dog trainer and Handler, Paws for Conservation

Board member and advisor, ADDC

Aran Clyne has been training and handling detection dogs since 2012, with qualifications in tobacco, cash, drugs and explosives handling. From 2014, Aran took a keen interest in the use of dogs for wildlife detection, training and utilising dogs for bat and bird mortality surveys on windfarms, pine marten scat detection, ivory/pangolin scale and product of animal origin detection, detecting endangered species smuggled through ports, and great crested newt detection. Aran trained multiple dogs in these disciplines, for work in the UK and Asia, and worked his dogs operationally in the UK, focusing mainly on bats, birds, and great crested newt. Aran also held taster sessions, showcasing his dogs' talents for members of the public that were keen to learn about conservation dogs, and has appeared with his dogs on a variety of television programmes, including Springwatch, Countryfile and The One Show.

Currently, Aran is working for Paws for Conservation, which offer fully trained bat/bird carcass and soon to be trained great crested newt detection dog teams. Aran is registered on the Natural England CL08 great crested newt class (survey) licence and holds a licence to keep great crested newt in captivity, for the purpose of training detection dogs. Aran is a qualified assessor (level 3 teaching and assessment).

Kat Stanhope CEnv FCIEEM

Ecologist, Associate Director with Atkins and seconded as Ecology Lead on HS2

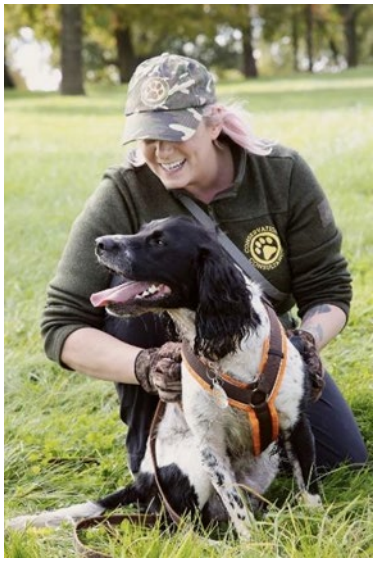
Board member and advisor, ADDC

Kat is a Fellow of the Chartered Institute of Ecology and Environmental Management (CIEEM) and a Chartered Environmentalist with the Society for the Environment (SocEnv).

Kat has over 20 years' experience as a professional ecologist relating to biodiversity issues and environmental management. This includes extensive experience of managing the scope, programme and budget of large environmental and ecological projects including national infrastructure projects, in the UK and overseas.

Kat is interested in finding innovative solutions for ecological survey, mitigation and monitoring and has been involved in developing conservation detection dogs since 2013. Kat wrote the first methodology for the use of detection dogs for commercial bat carcass monitoring in the UK for Wanlip wind turbine in 2013. A summary was published in the following article: *Stanhope, K. (June 2015) Wildlife detections dogs and the Wanlip Wind Turbine, In Practice (Issue 88)*. Kat produced a similar methodology for detecting pine martens to aid pre-construction surveys for a large infrastructure project in 2016.

Kat led research and held the conservation licence, between 2017 and 2019, for the first scientific study into the use of conservation dogs for great crested newt detection. The research was carried out in collaboration with Wagtail UK Limited and in liaison with Natural England. Following the research Natural England included a clause (the first of its kind) under a great crested newt mitigation licence for a nationally significant infrastructure scheme for the use of a suitably trained conservation dog to aid detection of great crested newt. The research also led to the publication of the following article on accreditation: *Stanhope, K. & Sloan, V. (September 2019) Proposed Method for Testing and Accreditation of Great Crested Newt Detection Dogs, In Practice bulletin of the Chartered Institute of Ecology and Environmental Management (Issue 105)*



Louise Wilson

Director, Conservation K9 Consultancy

Board member and advisor, ADDC

Louise has over 20 years international experience as a multi-discipline handler, trainer, instructor, and project manager. Louise was the Director and Head of Training for 12 Years at one of the UK largest specialist detection dog company, and is the founder of bringing conservation K9s to the UK with 15 years of promoting and showcasing detection dogs in conservation and ecology.

Louise has trained and handled in a massive variety of wildlife detection roles, including; bat carcasses at wind turbine sites, the entry and exit point of mice in a building to help with pest control, ivory, lion skins and pangolin scale detection for wildlife crime and smuggling prevention in Gabon, great crested newt detection for Amphibian Wildlife Conservation Project, cheetah scat detection in South Africa, dormouse nest detection for Cheshire Wildlife Trust, pine marten scat detection for Shropshire Mammal Group, water vole detection dogs for Natural Resources Wales, Atkins and the Environmental Agency, amphibian carcass detection for the Zoological Society of London. Louise trained the only Hedgehog Detection Dog in the UK working with the Peoples Trust for Endangered Species, as well as biosecurity dogs working for the British Antarctic Survey.

With a Diploma in Higher Education in animal behaviour and welfare, and over 18 years' experience of working and training specialist search dogs, a high level of enthusiasm and a genuine passion for dogs, welfare, conservation and wildlife, Louise provides a service that can offer a "Total Wildlife Solution" from supplying her own Existing Search Dog teams for wildlife monitoring projects, to training expert handlers for their own projects and their dogs, to full project management and consultancy of a specific conservation project and target species, as well as courses and mentoring for novices to experts.

As well as interests in wildlife conservation, Louise is inspired to try and increase awareness of working dog welfare and mental health through education and training.

Luke Gorman CEcol FCIEEM

Professional Head of Ecology & Associate Director, Atkins

Board member and advisor, ADDC

Luke is Fellow of the Chartered Institute of Ecology and Environmental Management and a Chartered Ecologist. He has worked for Atkins for over 19 years as an ecologist. He provides technical ecological advice for a variety of development schemes including housing, rail, water, energy, and transport for several clients.

Luke has a passion for finding innovative solutions for ecological survey and mitigation and has been involved in developing conservation detection dogs since 2017.

Luke was a key member of the core Atkins research team, in collaboration with Wagtail UK Limited and Natural England (NE), undertaking the first scientific research into the use of detection dogs for great crested newt (GCN) detection between 2017 and 2019. He was accredited under Natural England research licences for great crested newt conservation detection dog research, training, and trials. This work led to Rocky (a cocker spaniel) and Arnie (a springer spaniel) becoming the world's first ever scientifically proven great crested newt detection dogs. Following this work, Luke helped obtain and implement the first Natural England and Natural Resources Wales (NRW) development licences that specified the use of GCN detection dogs as the primary method of GCN search and capture.

Luke plays a pivotal role in promoting and advancing high standards in conservation detection dog work through his involvement in bespoke conservation detection dog training workshops and knowledge sharing through articles, conferences, TV features and podcasts. He has recently collaborated with Paws for

Conservation, under a Natural England science, education, and conservation licence, to develop and trial the next generation of great crested newt detection dogs.

Nikki Glover

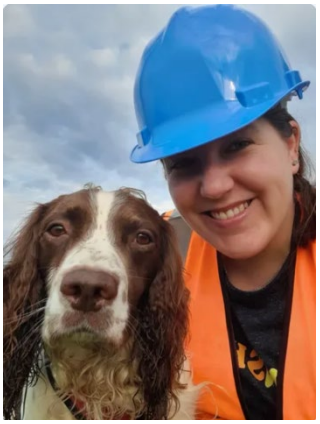
Senior Ecologist and Great Crested Newt Detection Dog Handler, Wessex Water and PhD student Salford University

Board member and advisor, ADDC

Nikki Glover has held her great crested newt Class 08 Level 1 Natural England licence since 2013. She has been a great crested newt detection dog handler since 2018 and is currently a senior ecologist working for Wessex Water. Nikki is a part time PhD student at the University of Salford supervised by Dr Robert Jehle looking at factors influencing the detectability rates of great crested newt detection dogs.

Nikki has been looking at a range of factors influencing detectability of great crested newts including whether dogs can detect great crested newts at distance, depth and through soil and whether vegetation length has an influence on their detectability. Nikki is in the process of releasing her first scientific paper alongside Robert Jehle and Louise Wilson in PLOS One journal “An experimental assessment of detection dog ability to locate great crested newts (*Triturus cristatus*) at distance and through soil”. Nikki is also looking into how great crested newt detection dogs compare to modern tools.

Nikki has been trained through Louise Wilson of Conservation K9 Consultancy since 2017 and received a licence through Natural England to possess great crested newts for the purpose of training a detection dog in 2018. Since 2018 Nikki has held nine licences through Natural England to possess great crested newts and undertake research trials and work on mitigation projects. Nikki has also used her dogs operationally for Wessex Water under Low Impact Class Licences, European Protected Species Mitigation licences and precautionary methods of working.



Rachael Flavell

Director, Paws for Conservation

Board member and advisor, ADDC

Rachael has been working with dogs since 2009 within a training environment and working with professional detection dogs since 2014. Over the years she has operationally handled, trained, and produced quality and efficient detection dogs for a variety of disciplines including, conservation, tobacco, cash, explosives, drugs, and live body detection. Being exposed to such a variety of disciplines and environments gave Rachael a true insight and understanding for working dogs and how individual they all are, their behaviours, precursors, and final responses. This in turn gave her the hands-on experience and knowledge to alter approaches to training effectively.

She has trained and handled dogs specifically within conservation to detect bat and bird carcass, great crested newt, water vole faeces, live animal detection, pangolin scales, cheetah skin, ivory, illegal meat products and pine marten scat. Rachael was one of two handlers, the other being Aran Clyne, who trained the ‘world’s first scientifically proven great crested newt dog’.

Rachael founded Paws for Conservation in 2020 wanting to solely concentrate her efforts and passion into protecting and preserving vulnerable British wildlife using highly trained specialist search dogs. Her company has been hugely successful in its first couple of years, having produced robust and proven search dogs that have scored highly in efficiency trials and consistently delivered results operationally, meaning that her client base continues to grow through word of mouth due the good reputation and professionalism.

Paws for Conservation ethos are to never compromise on quality, never rush training or take on more work than can be managed, including new target scents if this is at the detriment to the dogs being able to work effectively. Welfare of the dogs and the target species is paramount. No dog will ever be deployed operationally without having been externally tested or observed by a third party.

Rachael plans are to continue to push the boundaries for UK conservation dogs, being open to work collaboratively with like-minded organisations and individuals. Ensuring that high standards are maintained. Looking forward to the journey of growth and development.

Dr Robert Jehle

Reader in Population Biology

Subject Head for Biology & Wildlife, University of Salford

Board member and advisor, ADDC

Robert has a childhood interest in amphibians and their habitats and feels very privileged that he could turn this passion into a life-long academic career. Aside of a busy University teaching and administration schedule, Robert conducts research which has resulted in approximately 100 scientific publications to date and often combines fieldwork with genetic approaches. He has been involved in studies on all three amphibian orders, crocodiles, and fish, covering wild populations from Europe, Africa, Central & South America, Oceania, and Asia. In the UK, the main research focus is devoted to conservation-relevant projects on great crested newts and common toads. Robert is a former Chief Editor of the Herpetological Journal (the flagship scientific journal of the British Herpetological Society), and a current Associate Editor of the scientific journals Animal Conservation and Frontiers in Amphibian and Reptile Science. Robert is also currently a Trustee of the Amphibian and Reptile Conservation (ARC) Trust, a member of the IUCN Amphibian Specialist Group, and a Council Member of the Tropical Biology Association (TBA) based in Cambridge.

Robert has no direct experience with conservation detection dog training, but his collaboration with Nikki Glover has sparked a keen interest in the use of dogs for evidence-based conservation management of great crested newts.

Appendix B. Licence Assessment Checklist

When assessing licence applications, the Natural England assessor should ensure that the applicant has provided satisfactory evidence and details of the items listed in the summary table below in relation to their knowledge and experience.

Evidence of post training assessment by a third party, and operational deployment, are not included in the licensing checklist since these actions will not include captive great crested newts held under the applicants Natural England licence to possess great crested newts for the purpose of detection dog training.

Please note governing bodies will likely require additional information beyond that covered in the below checklist.

Licensing checklist	**Yes**	**No**
Knowledge of great crested newt ecology and experience of working with great crested newts		
An understanding of relevant legislation		
Details regarding biosecurity and welfare measures to be implemented		
Details regarding the source population and the method of capture and subsequent release		
Experience of working as a professional conservation dog trainer and handler or evidence of training/mentoring from a reputable conservation detection dog trainer		
Detailed training plan		

Appendix C. Becoming a GCN Detection Dog Handler Summary Flowchart

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