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Do UK Survey Licences for Otter Support Best Practice?

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Feature

Do UK Survey Licences for Otter Support Best Practice?

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Under the Habitats Regulations, resting/breeding places of otters (*Lutra lutra*) are protected from damage and disturbance, and ecologists are expected to identify such structures. Following an extensive programme of research, we now believe there is a more robust evidence base for what survey protocols are needed to identify such sites. In this article we (1) summarise some key aspects we believe represent evidence-based best practice for identification of otter resting and breeding sites, and (2) critically review the licensing conditions for otter surveys in the UK nations. Licensing for surveys with respect to otter holts varies between nations and in some cases could inhibit robust data collection, and thus we call for these to be reviewed. We also discuss the thorny issue of differing perceptions of disturbance, which inevitably accompanies our call for more intensive monitoring. We argue that there are potential repercussions resulting from suboptimal survey that outweigh any perceived disturbance from camera-trapping.

Best practice for surveying otter holts

Many terms are used to describe otter resting sites. A holt, by definition, is an otter's resting or breeding site which is enclosed, either underground such as in burrow systems in riverbanks or peatlands, or in hollow trees or rock piles. Here we use the term holt to mean an enclosed resting or breeding place, but where we want to specifically discuss a resting place or breeding place, we use that term. It is not our intention to provide a full protocol for field surveys of otter resting/breeding sites here (including how to locate potential sites), but rather highlight some key principles of monitoring, and the evidence base, that we believe in some cases would be prohibited by some licensing conditions. We are planning fuller surveying guidelines but they are too extensive for this article. The principles presented are based on our own field experience and research, including long-term (>6 years) monitoring of a holt (Findlay *et al.* 2017), trials investigating how and why camera traps can fail to record otters (Findlay *et al.* 2020) and, to our knowledge, the single largest camera-trapping study of otter holts (monitoring 26 sites for an average of 375 days each over a 4-year period across the River Tweed catchment; Findlay *et al.* 2023). This work is open access (see References).

Camera traps are necessary since field signs are not reliable

Field signs such as spraints and footprints can be useful to identify presence of otters in an area. However, at a time when otters occupy most of the UK, there should be a presumption of presence and surveys should aim to locate resting sites to ensure they are protected. We found no statistical link between the presence and abundance of field signs (including spraints, spraint piles, presence of bedding, footprints or presence of runs) close to a structure and whether that structure was a resting site or not (Findlay *et al.* 2023). Note, although we did find that observing bedding collection on camera-trap footage itself was a good indicator of a resting site, presence of bedding debris as a field sign is not reliable since it may not be present where resting is occurring, or other vegetation remains might be confused for bedding. The lack of any relationship between field signs and whether or not a structure functioned as a resting site was due to situations where either (1) active resting sites had few or no field signs nearby, or (2) we monitored structures that camera-trapping revealed were never rested in, but which were visited and sprainted at regularly. This is an important distinction: just because a site is visited (even regularly) by otters, it may not be a resting site.

The only field sign we found that appears to strongly indicate a resting site is the presence of a latrine, used by the resting animal(s) to defecate away from the sleeping chamber (something we saw regularly on camera traps at resting sites). Latrine sites are distinct in form and function from spraint sites, which are used primarily for communication. As we know latrine sites can be concealed within the resting site and invisible to a surveyor, apparent absence of a latrine does not categorically indicate absence of a resting site. Thus, it remains that with current technology the only reliable way to assess sites as resting and/or breeding sites is using camera-trapping. Camera trapping can (1) directly observe resting (for example, an animal entering a structure and then leaving after prolonged period), (2) capture other resting-associated behaviours such as bedding collection or (3) directly observe breeding information such as pregnant or lactating females, or cub emergence or occupation.

Camera traps should be placed close to the structure entrance(s)

For camera-trapping to be effective to observe otter resting or breeding behaviours, they need to reliably detect otter activity. Camera trap passive infrared triggers (triggered by the contrast between an animal's body heat and the background) are far from perfect, and can miss animals either by failing to trigger, or else they do trigger but the animal is already out of view by the time the camera activates (Findlay *et al.* 2020). Otters' speed of movement and frequently wet coat (which potentially is a closer match to the background temperature) exacerbate this. Research shows that increasing distance between the animal and camera trap is a significant negative predictor of trigger probability, as is coat wetness (Findlay *et al.* 2020, Lerone *et al.* 2015, Rowcliffe *et al.* 2011). Trigger probability of passing otters drops rapidly with distance from camera, particularly when the otter is wet (trigger probability of only 50% at 3–4 m, depending on camera-trap model) or when it is running (trigger probability of only 50% at 3 m) (Findlay *et al.* 2020). At a holt studied over several years, we have shown that a camera placed 1.6 m from the entrance recorded substantially more activity than a camera placed at 4.2 m (Findlay *et al.* 2017). Placing camera traps too far from the entrance of a potential resting site has a high risk of missing important information, which might lead to incorrect assessment of the structure and subsequent uncontrolled and unlicensed disturbance to, or destruction of, a protected site.

Camera traps need to be in place for a several weeks

Another key aspect to consider with camera-trapping is how long to monitor for, something which has hitherto been based on some balance of logistics and guesswork, understandably so in the absence of data on resting activity at individual sites. At six independent resting sites identified and monitored for at least a year each in the River Tweed catchment (Findlay *et al.* 2023), we found that the minimum camera-trapping duration that would be required to be 95% sure of correctly identifying a resting site was about 15 weeks' continuous monitoring during winter–spring or two 5.5 week periods, one in winter and one in spring, and that was when targeting surveys to the optimal time of year for our southern Scotland study area. From discussion with other ecologists, we suspect this is substantially longer than generally expected.

Although this optimal survey duration and timing could vary between regions, our study at least demonstrates that in one region such a time commitment would be required. Our study area is not atypical in terms of landscape and habitats of many areas of the UK and most of our study structures were in rural locations in a variety of common

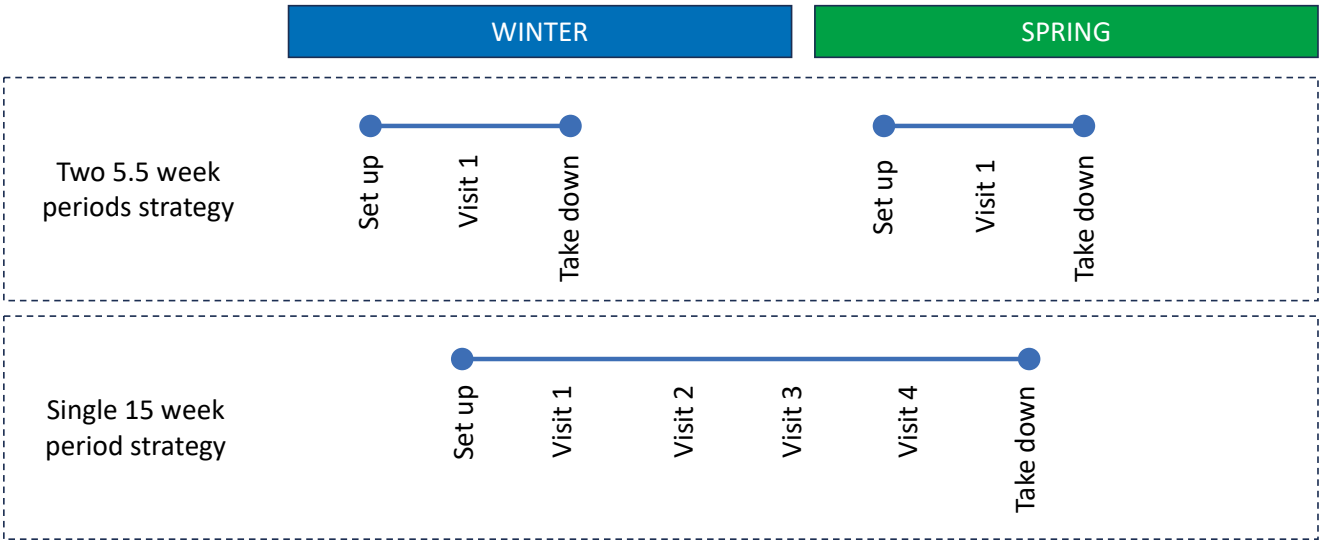

Figure 1. Hypothetical visitation schedules for camera-trap monitoring of structures to identify or rule out otter resting sites appropriate for the River Tweed catchment (Findlay *et al.* 2023). Our analysis suggested two potential strategies, each requiring six visits to the structure: (a) a minimum of 5.5 weeks in winter and again in spring or (b) a minimum of 15 weeks across the winter/spring period. Visits between setting up and taking down are necessary to avoid data loss risk (see main text). Note these are not prescriptive recommendations for all regions, but a demonstration that such a time commitment could be required.

habitats including pasture, riparian woodland and scrub. We have found that visits to change SD cards and batteries about every 3 weeks strikes a good balance between (1) the risk of data loss (SD card filled/depleted batteries/theft) and (2) minimising visitation frequency. With such a protocol, our minimum survey recommendations for the River Tweed catchment to have a 95% chance of identifying a resting site would require a minimum of six visits, including setting up, maintenance and removing camera traps (Figure 1).

Do licence conditions in the UK support or hinder best practice?

The approach to survey licences, which derogate any disturbance to otters from camera-trapping resting or breeding places in the UK, varies in terms of issuing administration. Licensing bodies play a key role in protecting species against potential harm. However, in the case of identification of otter resting and breeding sites, we believe that some licensing conditions support evidence-based best practice, while some could prevent it (Table 1). Although licence conditions may vary depending on context, all of the conditions in Table 1 were specified when it was clear the survey aim was identification of resting or breeding sites.

A key difference between regions is whether the survey licence is issued to a person (for use on any site in the region) or whether the licence is issued for a particular site. This difference has important implications because a personal licence means the ecologist has more flexibility and can act

Table 1. Pertinent issuing details and conditions of the UK licensing administrations for camera-trapping of potential otter resting and breeding sites, based either on email exchanges with each licensing authority or licences issued to MF. We present a subjective categorisation of whether these conditions support good otter surveys (using what we argue is evidence-based best practice; see section Best practice for surveying otter holts). Blue, facilitates best practice; orange, could restrict best practice.

	Issuing details		Conditions of methodology	
Issuing administration	**Entity the licence is issued to**	**Time to issue for a site**	**Minimum distance of camera traps to resting site**	**Number of visits to resting site allowed**
Natural England	The site	Target 30 working days	4 m	Five per year
Natural Resources Wales	The site or the county (negotiable)*	30–40 working days	No standard condition	No standard condition
NatureScot	The person (covering unlimited sites)	Not applicable as issued to person	Left to licence holder	Left to licence holder
Northern Ireland Environment Agency	The site	Maximum 15 working days	Only specifies not to be inside holt or block/ obscure runs	Must not entail 'frequent visits'

*For NRW, if issued just to the site, and given the 30–40 working days issuing time, this could prevent camera-trapping of sites in good time.

immediately, potentially lengthening the duration of camera-trapping in the project timeframe, whereas there can be a substantial delay while a site licence is obtained. As natal holts may only be used for 2–3 months, the resulting worst case scenario would be the loss of that essential window to confirm that a structure is used for birthing or housing very young cubs.

In terms of placement of camera traps, the minimum 4 m distance to a resting site specified by Natural England is not, to our knowledge, based on any concrete evidence and in fact has potential to seriously reduce detection probability of the otters (Findlay *et al.* 2017). This potentially impacts data quality and, most importantly, could result in misidentification of a resting or breeding site. Likewise, limiting the number of visits by the ecologist to five (as with Natural England), and without a minimum number of days between visits specified, leaves practitioners potentially able to visit a resting site every few days over 2 weeks, which would be a failure of the licence condition to reduce disturbance, while not facilitating a longer survey duration as we found would be required on the River Tweed catchment (Figure 1). With sensible maintenance intervals of 3 weeks or so, monitoring could be forced to cease before any resting occurs if the five-visit maximum is reached.

A balanced view of disturbance

A potential argument against what we consider would be best practice (see above) is that the placement of cameras close to holts and for longer periods would cause too much disturbance. The concept of disturbance has a subjective element, and we argue against the perception that any behavioural response to a camera trap represents disturbance. Novel objects in an area that is frequented regularly by a mammal are likely to be investigated, which could involve staring, sniffing or scratching at the object. From our experience, novel objects are common outside otter holts where flood debris and litter frequently appear. We argue that there is a difference between such behavioural responses and evidenced disturbance.

Figure 2. Still from camera-trapping video of an otter outside a resting site sleeping in front of a camera placed close to the structure entrance (shown in Figure 3). A second camera placed further from the entrance missed this resting activity.

European Union guidance (European Commission 2021, p26) on the interpretation of disturbance in Article 12 describes disturbance as an act that affects "the chances of survival, the breeding success or the reproductive ability of a protected species, or that leads to a reduction in the occupied area or to a relocation or displacement of the species". Whereas we have observed behavioural responses such as sniffing camera traps, we have never observed any responses that suggest displacement or impairment to survival or breeding. In fact, we have had otters choosing to sleep directly in front of camera traps (Figure 2) at several locations, and seen repeated use of sites for resting, for rearing young cubs and natal activity while our camera traps were *in situ* and close (approximately 2m) to the holt entrance. Our 6 year study of a breeding and resting site in Fife showed no statistical reduction in activity following visits to change camera-trap batteries or SD cards (Findlay *et al.* 2017); in this analysis we showed that probability of resting, use of holt for breeding, or scent-marking activity were not related to the number of days since the site had been visited for camera-trap changes.

Our view is that camera traps themselves are not an issue if set to avoid the resting site entrance and run/path to that entrance, even if placed close to the entrance. Visits by ecologists to set up and maintain equipment have greater potential to disturb if there are no mandatory

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controls in licence conditions. We follow a strict protocol at camera-trap sites to minimise impacts at the structure. We typically swap in refreshed camera traps (always using noiseless models with 'no glow' illumination) into wooden frames which cuts out the need to struggle with proprietary camera-trap straps (Figure 3). This means we avoid changing SD cards and batteries in the field, so routine maintenance visits take less than 5 minutes. While it is incumbent on the ecologist to take precautions against disturbance, the licence conditions should enforce sensible working practice which controls the risk but, at the same time, derogates the ecologist against breaking the law if an otter is disturbed despite following all the licence conditions.

When considering disturbance to otter resting or breeding sites, we believe that a key question must be asked in a survey licensing context. That is, what is the greatest potential risk for otters: (1) the risk that camera-trap surveys will disturb otters, something the evidence disputes where strict protocols are followed in setting up and visiting the camera traps; or (2) the risk that poor

Figure 3. Example of camera-trap set-up at a potential resting or breeding site. Cameras are placed close to maximise detection probability while avoiding any obstruction to the entrance and run(s) and in pre-designed emplacements. This means that maintenance visits are quick because replacement camera traps with correct settings can be swapped quickly but maintain the same viewing angles. A view from the closer (left) camera can be seen in Figure 2.

survey protocols, ignoring the evidence (through well-meaning precaution), miss key observations that would identify sites correctly as a resting or breeding site, which ultimately means a protected site is unintentionally heavily disturbed or destroyed?

Conclusions

There is now strong evidence to suggest that the only current reliable way to identify or, importantly, rule a site out as a resting or breeding site is through the use of camera traps, and these need to be placed relatively close to holt entrance(s) and for a sufficiently long period. Field signs may be useful for identifying presence of otters in an area, but are not a reliable way to identify if a structure is used for resting or not; the only reliable sign we found is the presence of a latrine (distinct from a spraint site or pile), but in some cases these are hidden, so absence of a latrine does not imply a site is not a resting place, and camera traps are needed. Where camera-trapping is done with strict protocols to minimise potential disturbance by the ecologist when setting up and visiting to check/swap camera traps this, we believe, will provide the best outcomes for otters. Some aspects of some licensing authorities' issuing processes and conditions do not currently facilitate best practice and we would call on these bodies to review this situation.

More broadly, we believe a change in attitude towards otter surveys is needed. Otters seem to be frequently perceived as an 'easy and low-effort' species, often with a single survey undertaken in tandem with a water vole (*Arvicola amphibius*) survey. We need a sea change in otter surveying, moving away from the idea that a quick survey based on field signs, or short period of camera-trapping (with camera traps placed cautiously far from a structure), are sufficient. An object of CIEEM's charter is to "advance … the standards of practice of ecology", and licensing needs to support new approaches by facilitating surveys that follow evidence-based methodologies. Surveying guidelines for other taxa have changed recently in response to scientific evidence (Collins 2023) and we believe it is time for a similar process for otters.

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