

The effectiveness of playback as a method for monitoring breeding Merlin *Falco columbarius* in Ireland



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Previous research on breeding Merlin *Falco columbarius* in Ireland highlighted numerous difficulties associated with standard methods for surveying and monitoring of the population. Playback of conspecific calls has been effectively used to survey a range of raptor species throughout the world. This study assessed the effectiveness of playback as a method of detecting breeding Merlin and the potential merit of this technique within future monitoring programmes. Playback was tested at 21 sites, which included traditional Merlin territories and areas of suitable Merlin habitat in counties Donegal, Mayo, Galway and Wicklow between April and July 2011. All sites were also monitored to determine Merlin occupancy and the outcome of any breeding attempts. This revealed that six of the 21 sites had breeding attempts in 2011. A total of 14 trials were conducted at these six breeding sites. A response from resident Merlin was recorded at 28% of trials. Contrary to results from previous Merlin playback studies, the majority of responses were discreet, generally consisting of short flights to a prominent perch, with no vocal responses recorded. The findings indicate that playback can be useful in confirming occupancy of breeding Merlin. However, it is not a reliable method for surveying breeding Merlin in Ireland, as it is not possible to confirm absence of Merlin in an area from a negative response to playback. Further research on alternative methods of locating breeding sites is recommended to benefit long term monitoring of populations.

Introduction

Many species of raptor, both diurnal and nocturnal, respond to conspecific calls (Mosher *et al.* 1990, Redpath 1994, Salvati *et al.* 2000). Broadcasting calls has therefore been widely used to survey raptor populations, particularly in forested habitats

(Andersen 2007). Although detection rates by conventional methods are generally higher for open habitat diurnal raptors than for those occupying dense forest (Salvati *et al.* 2000),

Plate 63. Merlin (Darío Fernández-Bellon).

difficulties in detecting and locating raptors in open habitats have been addressed by the use of acoustic methods (Salvati *et al.* 2000, Barnes and Jaeger 2010). Playback has not been frequently used as a survey method for Merlin *Falco columbarius* in the past. Two studies in North America reported some success with the use of this technique (Doolittle and Balding 1995, Ayers and Anderson 1999), but there is no information available on similar research in Europe (Hardey *et al.* 2009).

Previous research in Ireland highlighted numerous difficulties associated with detecting and surveying breeding Merlin using the standard methodology, which has been successfully employed in other parts of the species' range. Evidence used for locating pairs by standard methods (such as plucking signs and sightings near the nest site) was less effective than reported from studies in other countries (Fernández-Bellon *et al.* 2010). This is potentially a consequence of the predominance of tree-nesting populations in Ireland and the behavioural differences between ground- and tree-nesting birds (Little and Davison 1992). The aim of this study was to assess the potential benefits of playback as a method for future survey and monitoring of the Merlin in Ireland.

Study areas and methods

Methods for playback trials were based on previous research and monitoring work which employed this method to survey breeding Merlin (Doolittle and Balding 1995, Ayers and Anderson 1999) and other raptor species (Rosenfield *et al.* 1988, Redpath 1994, McLeod and Andersen 1998, Salvati *et al.* 2000, Barnes and Jaeger 2010).

A total of 21 sites were selected in Counties Donegal, Mayo, Galway and Wicklow, incorporating historical sites and areas of suitable Merlin habitat. Playback trials were performed at all sites during April to July 2011. Simultaneous to the playback study, all sites were monitored following standard methodology (Hardey *et al.* 2009) to detect the presence of Merlin and determine the stage and outcome of recorded breeding attempts. Playback trials were carried out at each site between 08:00 and 12:00 hours, with broadcast points located at a distance of 100-500m from the known or expected nest site. Fieldworkers waited for five to ten minutes after arrival at the broadcast point before initiating the playback trial. To avoid observer bias, if any Merlin were located at this stage, fieldworkers waited until they moved out of sight, or selected a new broadcast point from which the birds were not visible. A pre-recorded track consisting of three 30 second sequences of conspecific male and female alarm and prey delivery calls, separated by intervals of 60 seconds, was used at each playback trial. Broadcasts were performed using a TOA Electronics 800 MHz wireless megaphone with a reach of 800-

1000m. During, and after, each broadcast fieldworkers recorded any response from resident Merlin by scanning the area with binoculars and listening for vocal responses. If Merlin were detected (sighting or call) during the broadcast, playback was immediately stopped to avoid unnecessary stress to the birds.

For each playback trial, the date and time of playback, distance and direction from broadcast point to nest site, weather (wind using Beaufort scale, rain (none, light, moderate or heavy)) and the sex, age and behaviour of any Merlin observed prior to the trial was recorded. Whenever Merlin responded to the broadcast, further details were also noted, as follows.

Latency: time from start of broadcast to first response.

Number of call sequences played prior to response.

Sex, age and position with respect to nest and broadcast point of responding individual.

Description of response behaviour: vocalisations, distance and direction of flights, type of perch.

Adverse weather was avoided, and all trials were carried out on calm days with little or no rain.

To minimise disturbance to breeding birds, trials were spaced throughout the season, and a maximum of six were carried out at any given site between April and July, with a



Plate 64. Merlin Fledgling (Dario Fernández-Bellon).

minimum interval of two weeks between trials. Particular attention was paid to reactions and responses of birds to evaluate any negative effects or undue stress as a result of the broadcasts. Results from site monitoring were used to evaluate the effects of playback trials on breeding activity and success during the season.

Results

A total of 54 playback trials were performed at 21 sites in 2011. However, comprehensive monitoring work indicated that many of the trials ($n = 40$) were carried out at sites which were unoccupied, or at sites where attempts had failed prior to the playback visit. Only trials ($n = 14$) which were carried out at breeding sites active at the time of broadcast ($n = 6$) were used for analysis (Table 1). Site monitoring, which included detailed observations of Merlin behaviour throughout the season indicated that trials had no effect on breeding activity and success.

The 14 trials analysed were carried out at six sites, with a minimum of one and maximum of five trials per site. Weather conditions were favourable, with no rain recorded during the majority of playback trials ($n = 12$), light rain during two trials, and wind speeds ranging from 0-4 on the Beaufort scale on all trials. Presence of Merlin in the area within acoustic reach of the broadcast was confirmed by observations before or after the trial for the majority of cases (78.6%, $n = 11$). Although Merlin were not observed in the remaining trials ($n = 3$), it is likely that at least the female was present and on the nest at the time of the playback (Table 1).

Merlin response to broadcast calls were recorded on 28.6% of the trials ($n = 4$, Table 1). Responses took place during the first sequence ($n = 3$) and after the third sequence of calls ($n = 1$), resulting in an average latency of 72 seconds (range 8-235 seconds). All four responses were described as exploratory flights with no vocalisations from the bird. In one instance, an adult female flew into view and soared over the nest area and the broadcast point, before flying out of sight. In the remaining three responses recorded (involving an adult

male, a female and a fledgling), Merlin were observed flying a short distance to a prominent perch (tree top or fence post), and remaining there, apparently scouting the surrounding area.

Discussion

Broadcast of conspecific calls has been found to be a successful technique for locating and surveying a variety of raptor species (Rosenfield *et al.* 1988, Mosher *et al.* 1990, Redpath 1994, McLeod and Andersen 1998, McClaren *et al.* 2003), including open-country falcons (Salvati *et al.* 2000, Barnes and Jaeger 2010). However, results regarding Merlin are not conclusive. In the Great Lakes area of North America, 72% of the pairs located during a six-year monitoring project were detected solely by broadcasting Merlin calls (Doolittle and Balding 1995). However, similar work in Wyoming found that playback only accounted for 33% of first detections of breeding pairs (Ayers and Anderson 1999).

The current study recorded a low frequency of responses to broadcasts. In addition, responses were more discreet than reported by other studies, which recorded Merlin flying towards and over observers while vocalising repeatedly (Doolittle and Balding 1995, Ayers and Anderson 1999). No vocal responses to broadcast calls were recorded by this study. Responses were generally very discreet (75%) with birds making a short flight from their initial position (out of sight) to a more exposed perch, from which they then appeared to observe their surroundings. Only one response (25%) was considered to have been obvious and easy to detect. The current study indicates that broadcasting Merlin calls can be a useful technique to confirm occupancy. However, it is not a reliable survey method for the species, as non-occupancy in an area cannot be determined from a negative response to playback.

Previous research on the Irish Merlin suggests the species is more discrete than has been recorded by studies in other countries (Fernández-Bellón *et al.* 2010). This suggestion has been re-enforced by the findings of this study. Difficulties with

Table 1. Summary of results of playback trials carried out at Merlin sites in 2011.

Site	No. of cases	Percentage
Total No. of trials at active sites	14	-
Merlin presence in area confirmed	11	78.6%
Trials recording responses	4	28.6%
Bird involved:		
Female	2	14.3%
Male	1	7.1%
Fledgling	1	7.1%
Visual responses	4	28.6%
Vocal responses	0	0%

detecting and locating the Irish Merlin can likely be attributed to differences in nesting ecology, as tree-nesting sites (which predominate in Ireland) are harder to locate than those of birds nesting on the ground (Little and Davison 1992). However, the present study suggests that behavioural differences between Merlin populations may also help explain the difficulties associated with surveying this species in the Irish context.

Further research is recommended on alternative methods of detecting breeding Merlin to benefit long term monitoring of populations. The response of the Merlin to potential nest predators is considered useful in locating nest sites (Hardey *et al.* 2009). However, preliminary results on Merlin response to predator decoys suggests that this behaviour may not be a reliable means of detecting breeding pairs in Ireland (Fernández-Bellon *et al.* 2010, Fernández-Bellon and Lusby unpublished data). However, results are not considered conclusive and further work on reactions of Merlin to potential nest predators and the usefulness of this behaviour for survey purposes is required.

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