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**THE IRISH GREY PARTRIDGE (*PERDIX PERDIX*) CONSERVATION STRATEGY:
AN UPDATE 1995-1998.**

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ABSTRACT

KAVANAGH, B.P., O'GORMAN, C., AND BUCKLEY, C.: THE IRISH GREY PARTRIDGE (*PERDIX PERDIX*) CONSERVATION STRATEGY: AN UPDATE 1995-1998. In May 1996 a strategy for the conservation of the last remaining population of the Irish Grey partridge was initiated. The strategy is a multipronged approach based on a) predation reduction, b) habitat improvement and c) monitoring of the birds' response. A full-time game keeper was employed to reduce red fox (*Vulpes vulpes*), mink (*Mustella vison*), stoat (*Mustella erminea*), rat (*Rattus norvegicus*), grey crow (*Corvus corone cornix*) and magpie (*Pica pica*) numbers in a defined study area of 1,000 hectares of cutaway bog at Boora in County Offaly. The habitat is a mosaic of cutaway bogland, coniferous forestry, newly created farmland and wetland. The area contained 6-8 pairs of breeding grey partridge in spring 1996. Bare peat areas within the study area were selected and a mix of either grass or grains were planted in 0.2 hectare blocks to provide nesting or chick rearing cover for birds. These plots were neither sprayed or harvested and have been left to develop naturally after planting. Fifteen hectares were planted over two years, 1996-97. In spring 1997 a number of male partridges were trapped and fitted with radio collars. Their home range and habitat preferences were recorded continuously for up to ten months. Radio-tracked birds were recorded leaving the kept area and moving to winter stubble fields on adjoining farmland. Two successful coveys were produced in 1996 which resulted in an autumn count of 27 partridges in the study area. In spring 1997 the population in the study area was again 6-8 pairs. Two successful coveys were again produced in 1997 giving an autumn population of 23 birds within the study area. Winter survival in 1997/98 was poor. In spring 1998 only 4-6 pairs of partridges were found in the study area. Partridge numbers continue to decline both within and outside the study area. The remaining population is now less than 20 breeding pairs in total.

1. INTRODUCTION

The Grey Partridge is an endangered species in Ireland (KAVANAGH, 1992; WHILDE 1993). In 1995 only two discrete populations remained (KAVANAGH, 1998) comprising a total

population of less than 100 breeding pairs. The larger population was located at Boora, Co. Offaly and the smaller was at Lullymore, Co. Kildare.

Research has been conducted on the birds since 1991 (KAVANAGH, 1992; GIBBONS ET AL. 1993; HEARSHAW, 1996) which has enabled a strategy for the conservation of the species to be devised. This paper reports on the progress of the conservation strategy adopted in May 1996, which was discussed previously in KAVANAGH (1998).

2. STUDY AREA, MATERIALS AND METHODS

The conservation effort has focussed on the larger population at Boora Co. Offaly, (**Figure 1.**) The smaller population at Lullymore, Co. Kildare, was regarded as the control group. The majority of land in the study area was in state ownership. Most of the area was formally classed as bogland which has been exploited for energy production by the state owned PEAT ENERGY BORD (Bord na Mona).

After exploitation land was converted to forestry or grassland use depending on the soil characteristics, remaining peat depths and topographical features of the site. In 1998, the land-use categories mapped were 27% grassland, 20.3% tall forestry, 20% undeveloped cutaway, 5.3% high bog, 5% tillage and the remainder divided amongst edge features such as drains, hedges, roads, railway lines etc. (O'GORMAN, ET AL, 2000).

The conservation strategy took a three pronged approach broken into three general areas,

- a) Predation control
- b) Habitat improvement and
- c) Bird response.

As the birds were dispersed over a large area, predator control was concentrated on the centre of the birds' distribution. A fulltime gamekeeper was employed to reduce predators in the study area of approximately 1,800 ha. Predators removed were red fox (*Vulpes vulpes*), American mink (*Mustella vison*), stoat (*Mustella erminea*), feral cat (*Felis catus*), rat (*Rattus norvegicus*), Grey crow (*Corvus corone cornix*) and magpie (*Pica pica*). A special section 42 licence was obtained under the national 1976 Wildlife Act, to allow the control of stoats in the study area.

Habitat improvement involved the creation of grassy strips and tillage crops on bare peat areas throughout the study area. The former was designed to provide quality nesting cover and the latter to guarantee a supply of insect rich, chick rearing cover for the pairs.

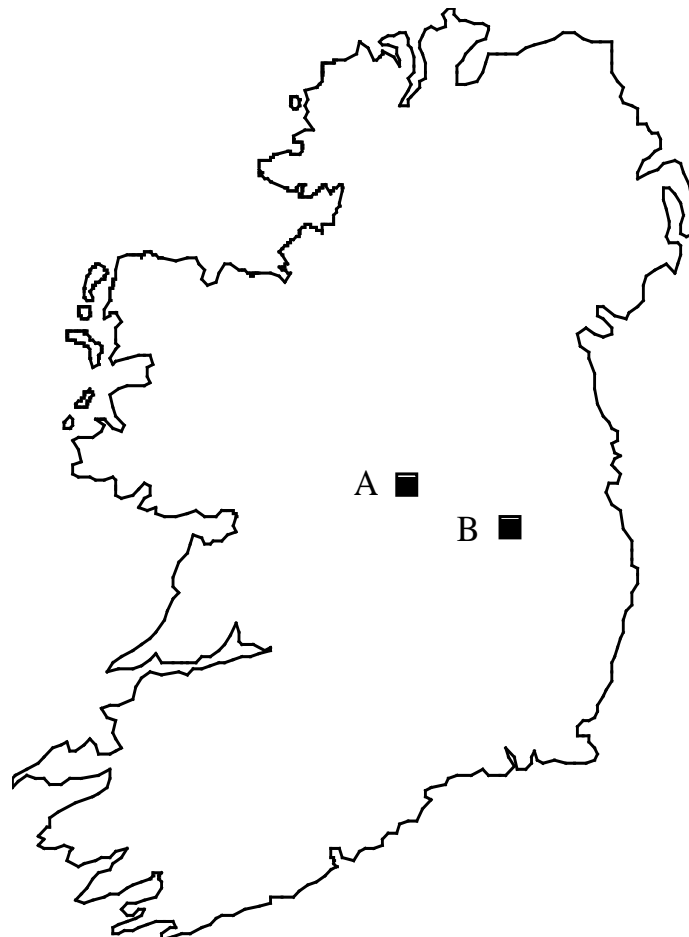


Figure 1. Map of Ireland showing location of two remaining grey partridge populations in 1998. Site A: Boora, Co. Offaly, site B; Lullymore, Co. Kildare.

Grass mixtures, which were of non-commercial varieties, included cocksfoot (*Dactylis glomerata*), creeping red fescue (*Festuca rubra*) and timothy (*Phleum pratense*). Tillage crops sown were a mixture of wheat (*Triticum aestivum*), barley (*Hordium vulgare*), oats (*Avena sativa*) and some white clover (*Trifolium repens*). These crops were not harvested.

The bird response was measured using radiotelemetry to assess bird movement patterns, home range and habitat preferences within their ranges. Radiotracking was conducted from spring 1997 to winter 1998. Full details of this aspect of the project are being prepared. In this paper we report on aspects of the radiotracking which are relevant to the

conservation efforts for the species. Fuller details can be found in O'GORMAN, *ET AL* (1999) and O'GORMAN (1999, in prep)

The annual autumn census of the two remaining populations in LULLYMORE AND BOORA were conducted as outlined in KAVANAGH (1998). These provided additional information on the performance of the conservation strategy for the species.

3. RESULTS

Table 1 lists the total number of predators removed from the study area from May 1996- October 1998. Red fox and feral cats were removed using lamping by night. This was conducted 2-3 nights per week on average. A small number of foxes were also snared. The remainder of the species listed were caught in Fenn 4 and Fenn 6 tunnel traps placed in strategic positions throughout the study area.

Habitat strips were planted in 1996 and 1997. These were sown in alternate strips of nesting cover and chick rearing cover. The strips varied in width from 6 - 12 meters and ran for 100m where possible. These were dispersed throughout the study area and totalled 20 ha over the two years.

Table 1: The total number of predators removed from the study area between May 1996 and October 1998, with duration of culling season for each.

Species	Number of individuals	Period
Red fox	156	All Year
Stoat	42	February - August
Mink	21	February - August
Feral cat	13	All Year
Rat	41	February - August
Magpie	81	February - August
Grey Crow	173	February - August

The radio-tagged partridge showed seasonal variation in the use of habitats available to them. Habitat strips and young forestry plantations were used to a greater extent than expected during the breeding season. Coveys moved several kilometres from their breeding areas to utilise stubbles on adjacent farmland.

Table 2 shows the total population size based on an annual autumn census of the two remaining partridge populations in Ireland conducted since 1993. Both the control population at Lullymore, where no predation control is practised, and the Boora population with the gamekeeper, have declined since 1995. The total number of birds remaining in the wild in 1998 was 32.

Table 2: Autumn count of grey partridge in Lullymore and Boora cutaway boglands, 1993 – 1998.

Year	Lullymore	Boora	Total
1993	26	38	64
1994	23	79	102
1995	41	107	148
1996	17	42	59
1997	15	55	70
1998	8	24	32

The annual autumn census of the remaining grey partridge provides information on covey size each year. **Table 3** shows the mean size and the number of coveys from which this is drawn. While the covey size has not changes significantly over the years the number of coveys has decreased annually. In 1998 only four coveys larger than two birds was recorded.

Table 3: Annual covey sizes of grey partridges on cutaway bogland in Lullymore, Co Kildare and Boora, County Offaly, between 1991 and 1998. Only coveys of three or more birds are included in the data.

Year	mean covey size	SD	n
1991	7.36	2.62	11
1992	6.63	2.01	11
1993	5.11	2.34	9
1994	7.00	1.09	10
1995	7.38	3.28	13
1996	6.63	3.74	8
1997	9.00	3.56	7
1998	6.75	3.86	4

4. DISCUSSION

The grey partridge has continued to decline in Ireland despite the conservation efforts outlined in this and other reports. Both the control population in Lullymore and the managed population at Boora appeared to run in parallel with each other between 1993 and 1995, before the implementation of the conservation strategy and from 1996-98 when the conservation effort was put in place in Boora. The variation between years in the data set is greater than the variation between the two population data sets. This prevents the detection of any difference in trend between the two populations. Thus while it might be important to evaluate the impact of the conservation strategy on the Boora population there are too few data available at this point to make a valid comparison. Notwithstanding this, there has been a contraction in range in the Boora population outside the study area.

Within the study area, where predator reduction is exercised, the number of pairs remained stable at 6 - 8 each year until spring 1998 when it dropped to 4-6 pairs. Poor winter survival in 1997/98 was recorded. Breeding performance of these pairs has been no better than in the population as a whole and recruitment to the breeding population depended on two coveys produced in 1997 and one covey in 1998.

The radio-telemetry data indicated that young forestry and habitat strips in cutaway areas were used for breeding in preference to adjacent recolonised cutaway bog (O'GORMAN, *ET AL.* in press). In Lullymore radiotracked birds bred on recolonised bog in the absence of these alternative sites (HEARSHAW, 1996). In spring when pairs are speculating for suitable nesting sites, both young forestry and habitat strips may offer greater residual cover than recolonised areas of cutaway bog. However, young forestry becomes unsuitable after several years when the canopy closes and as it matures, can become a barrier to partridge movements.

The conversion of cutaway areas to grassland continued throughout 1996-98. Each year potentially suitable nesting habitat on the cutaway areas was lost and pairs attempting to breed on new grassland were unsuccessful. Local populations have disappeared in this time.

The movement of coveys from cutaway areas to adjacent farmland in autumn and further afield in winter provides management difficulties. It is our opinion that there is greater disturbance due to pheasant shooting in these areas, which could have led to increased winter mortality of partridges both directly and indirectly. The creation of suitable green cover for birds in winter may stop this drift into peripheral areas.

Many authors have reported on the impact of weather on the breeding success of partridge (POTTS, 1986; GREEN, 1984) and the annual autumn counts of estates in the United

Kingdom show a clear relationship between breeding success and summer temperature, rainfall data. The poor response of the Boora partridge population to the management practises implemented under the conservation strategy were in part due to the bad summer weather in 1996, 1997 and 1998. Many reports of young chicks were received in June and July were followed by observations of pairs without young in the same locations shortly afterwards.

Birds forced to nest in unfavourable habitats will be poorly disposed to cope with bad weather. It is hoped that the creation of better quality habitat within the Boora area will help the remaining birds to breed more successfully both in good and in poor weather conditions. The total national population of grey partridge in 1998 was less than 20 breeding pairs.

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