APPENDIX 7-7

BIRD MITIGATION PLAN

Planning and Environmental Consultants

Bird Mitigation Plan

Cooloo Wind Farm

DOCUMENT DETAILS

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1. INTRODUCTION

This Bird Mitigation Plan has been prepared by MKO for the Proposed Project. It has been informed by surveys undertaken from September 2019 to March 2025. Based on these surveys, key ornithological receptors (KORs) in the study area were identified and the potential effects of the Proposed Project on these receptors during the construction, operational and decommissioning phases are assessed in the Environmental Impact Assessment Report (EIAR).

During preparation of the EIAR, the potential effects of collision risk during the operational phase of the Proposed Wind Farm was assessed. For the majority of KORs assessed, the effect was determined to be of 'low' or 'very low' significance (as defined by Percival, 2003). However, the effect was determined to be of 'medium' significance for golden plover. It was deemed necessary to mitigate the significance of this effect. Thus, a Bird Mitigation Plan was prepared for this species, prescribing measures to mitigate this effect such that the significance of the residual effect will be of no greater than 'low' significance (as defined by Percival, 2003).

The objective of the Bird Mitigation Plan is to reduce the significance of the effect of collision risk for golden plover. This will be achieved by introducing measures to reduce flight activity of golden plover in the vicinity of the operating turbines. The following sections describe golden plover ecology and the predicted impacts of the Proposed Project on birds using the Proposed Wind Farm site. The next section presents the methods for the approach, land area selection, management prescriptions and implementation of this Bird Mitigation Plan. The final section outlines monitoring and evaluation of the proposed mitigation measures. Reporting on the effectiveness of the Bird Mitigation Plan will be incorporated into the reporting for the Bird Monitoring Programme for the Proposed Project (refer to Appendix 7-8 Bird Monitoring Programme).

1.1 Golden Plover Ecology

During winter, foraging golden plover in Ireland utilise lowland agricultural pastures (particularly permanent pasture and damp fields), where their invertebrate prey resides just below the soil surface and are accessible to the birds, even during periods of cold weather. Golden plover may also utilise winter cereals, although their invertebrate prey tend to be less abundant here. Birds tend to avoid bare till, as the lack of vegetative insulation causes their invertebrate prey to move down the soil profile, where it cannot be reached by the birds (Fuller and Lloyd, 1981; Gillings and Fuller, 1999). There is some evidence that they may also avoid sheep pasture for similar reasons; sheep graze the grass tightly, reducing vegetative insulation and thus reducing access to invertebrate prey (Tucker, 1992). Golden plover also tend to avoid pasture with high swards (Brough and Bridgman, 1980; Gregory, 1987). This may be because invertebrate prey are more difficult to detect and access among obscuring vegetation, in combination with other factors such as reduced mobility and the chilling effects of wet vegetation (Butler and Gillings, 2004). Roosting golden plover utilise pasture and arable land during winter (Fuller and Lloyd, 1981). Open fields with short swards may be preferred because of improved predator detection by roosting flocks (Brough and Bridgman, 1980).

1.2 Description of Impacts

During pre-planning surveys from September 2019 to March 2025, golden plover was regularly recorded at the Proposed Wind Farm site in winter. Birds were observed in flight and sometimes foraging and roosting.

Birds were observed foraging (it is possible some birds in these flocks were roosting) on grassland at Leecarrow (labelled as GP-3 in the map in Appendix 7-5). Flocks here were concentrated in the fields south of the Proposed Wind Farm site boundary, however four were within the Proposed Wind Farm site boundary itself, in proximity to a proposed turbine location.

Other foraging activity was recorded outside the Proposed Wind Farm site. A flock was recorded foraging once at Cooloo, outside the Proposed Wind Farm site boundary and ~270m from the nearest proposed turbine location (GP-4). Birds were also foraging in a section of bog at Derrybaun (GP-1), largely outside the Proposed Wind Farm site and where no infrastructure is proposed.

Similarly, golden plover was recorded roosting in proximity outside the Proposed Wind Farm site. There was a roosting area in a section of bog at Derrybaun that was used on multiple occasions (GP-1). The roost was outside the Proposed Wind Farm site boundary and no infrastructure is proposed here. This section of bog is ~390m from the nearest proposed turbine location at the closest point. However, the separation distance exceeds 390m as birds were generally using the open centre of the bog (roughly 600m from the nearest proposed turbine location), rather than the nearest edge. There was a second roosting area at Horseleap Lough (GP-2). This roost was also outside the Proposed Wind Farm site boundary and ~900m from the nearest proposed turbine location.

During preparation of the EIAR, a collision risk assessment was conducted for golden plover using the Band Model (Band, 2007). Data collected during vantage point surveys was used to predict the number of collisions that may be caused by a turbine, based on winter season flight activity (refer to Appendix 7-6 Collision Risk Assessment of the EIAR). The number of golden plover collisions per year was estimated to be 197.81 birds.

The county population for each golden plover was estimated using data from Irish Wetland Bird Survey sites in Galway and information from field surveys conducted from September 2019 to March 2025 (see Section 7.4.1.1 of Chapter 7 of the EIAR for further details). While it is acknowledged that there are limitations to using these data, it is currently the best available data, as there are no other systematic counts of golden plover in this part of Ireland, and it provides a higher resolution than inferring county populations from national counts which do not take into account variation in spatial distribution nationwide. The county population of golden plover was estimated to be 5,895 birds.

The literature indicates that annual natural mortality of golden plover is 27% (Sandercock, 2003). Thus, an estimated 1,591.65 golden plover in the county are assumed to die of natural causes each year. If 197.81 golden plover fatalities were to occur at the Proposed Wind Farm each year, it would increase mortality rates in the county population by 12%. This impact is of 'medium significance' (as defined by Percival, 2003). Thus, mitigation measures are proposed.

2. METHODOLOGY

2.1 Approach

Collision risk mitigation will focus on reducing golden plover flight activity within 500m of the turbines. Because golden plover were observed flying in to forage in certain fields within the Proposed Wind Farm site, the mitigation approach is to deter birds from flying into these fields. Tethered bird control kites will be erected in the fields to provide visual deterrents. Similar approaches have been used to deter birds from airfields in Ireland to reduce the risk of collision with aircraft (O'Shea *et al.,* 2020). Foraging golden plover often circle above foraging areas before choosing a patch to land and when relocating between patches, as well as when flushed by potential dangers. The absence of grounded foraging flocks should further reduce the flight activity of flocks in the turbine area. This mitigation approach will be implemented in the areas of the site that were observed to be the most regularly used by golden plover. The process of field selection for mitigation is discussed in further detail in the next section.

2.2 Land Selection

The results of pre-planning surveys from September 2019 to March 2025 indicate that golden plover do not uniformly utilise the study area, rather specific areas were favoured. Such favoured fields that were also located in close proximity to turbines were targeted for mitigation.

1. All fields within a 500m radius of the turbines which golden plover were recorded using (i.e., for foraging or roosting) were eligible for evaluation. In circumstances where a field with no birds present linked surrounding fields that were used by birds, the linking field was eligible, to account for birds moving around a group of fields as a unit.

2. Due to the foraging and roosting ecology of the species in question, the nature of the data and the purpose of the analysis, fields were considered for mitigation if they met either of the following criteria:

    - Numbers of county importance were observed using an area of fields two or more times during the survey period (i.e., landed in the field or were foraging or roosting). Following NRA (2009), a population of County Importance is a regularly occurring population that exceeds 1% of the county population. Thus, a regularly occurring population of at least 59 golden plover is considered to be a population of County Importance in the study area.

    - Large flocks of golden plover were observed using an area of fields one or more times during the survey period (i.e., landed in the field or were foraging or roosting). Large flocks are defined here as 20% or more of the county population. A large flock of golden plover was defined as over 1,179 birds.

3. Fields meeting this criteria that were within the Proposed Wind Farm site were selected for mitigation.

A total of two fields were selected for mitigation. These fields are within the Proposed Wind Farm site and form part of the planning application. The mitigation fields are presented in Figure 7 - 7 - 1. Note that these are very large fields, therefore the areas of these fields that were being used by golden plover are shaded.

Map Legend

- Proposed Wind Farm site
- Proposed turbine locations
- Mitigation Lands
- Areas used by golden plover

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Drawing Title

Bird Mitigation Lands

Project Title

Cooloo Wind Farm

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190723-m	Figure 7-7-1
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2.3 Management Prescriptions

This section outlines the management prescriptions that are proposed to deter golden plover from entering the mitigation fields and hence reduce flight activity in the turbine area and its associated collision risk. The measure is to erect tethered bird control kites in the areas of each mitigation field that golden plover are using to deter birds from foraging in them.

Bird Control Kites

The bird control kites will be imitations of raptor birds (eg. hawks, falcons) and attached to a tether approximately 8m in length, in turn attached to a pole approximately 10m in length, that is secured to the ground near the centre of the field to maximise the effect. This will create weaving and hovering movements akin to hunting raptor birds c. 2-18m above the ground and will be suitable for a range of wind speeds (O'Shea *et al.,* 2020). This representation of a hunting predator will provide a deterrent to golden plover landing in the field. Bird control kites are widely used to deter birds from crops, businesses and gardens and have been shown to reduce the number of birds present in agricultural fields (O'Shea *et al.,* 2020).

Timeframe

It is proposed to apply mitigation measures during the wintering period as this was the key collision risk period for golden plover. Surveys conducted in the study area between September 2019 and March 2025 indicate that wintering golden plover numbers of County Importance most often occurred within 500m of the turbines between the months of October and March. Over all winters combined, wintering golden plover were first observed in October and were recorded through the winter until March, after which there was a notable decrease in April. Thus, mitigation measures will be in effect between 1st October and 31st March each year of operation.

Summary

In summary, the following management prescription will be in place in the mitigation fields for the operational lifetime of the Proposed Wind Farm (summarised in Table 7 - 7 - 1):

- Bird control kites will be erected in the areas used by golden plover between 1st October and 31st March inclusive each winter inclusive.

Table 7 - 7 - 1 Management prescription

Prescription	Time Period	Year of Operation
Bird control kite erected	October to March	Every year

2.4 Implementation

It is proposed that a suitably qualified environmental scientist, ornithologist or ecologist will be engaged by the wind farm operator to oversee the implementation of this Bird Mitigation Plan. The management prescriptions will be implemented on an individual landowner-by-landowner basis as follows:

1. At the pre-application stage, the management prescriptions have been explained to the individual landowners prior to inclusion in the application and are acceptable to each consenting landowner.

2. At the pre-commencement stage, a meeting will be held with individual landowners to outline the general aims, objectives and requirements of the Bird Mitigation Plan.

3. At the pre-commencement stage, bird control kites (including tether and pole) will be provided for the mitigation fields. All kites must meet the specifications outlined in Section 2.3 above. Instructions on the deployment of the kite will be included in the meeting discussed in Point 2.

4. During each year of the operational phase, the overseeing environmental scientist, ornithologist or ecologist will monitor and evaluate the mitigation fields. Full details of the monitoring and evaluation are outlined in the following Section 3.

5. If bird control kites become damaged or no longer function, they will be replaced by the wind farm operator in a timely manner.

3. MONITORING AND EVALUATION

3.1 Previous Studies

Similar approaches to the Bird Mitigation Plan proposed here have been used to deter birds at other places. For example, O'Shea *et al.* (2020) investigated imitation hawk-kites as a method for deterring woodpigeons from airfields in Ireland. Trials with and without kites were conducted at an airfield and agricultural farmland. There was a significant reduction in the mean number of woodpigeons crossing sites with kites compared to control sites.

This approach has benefits in comparison to other bird deterrent approaches. It is a passive approach that does not require the use of disruptive noise or light (e.g., in comparison to other deterrence methods such as playing distress calls or using pyrotechnics and gas cannons), is not disturbing to landowners with livestock or crops (e.g., in comparison to deterring birds with trained falcons and dogs or using water spray) and is not disturbing to other wildlife (e.g., in comparison to ultrasound, infrasound or microwave broadcasts). A passive approach will also avoid risky evasive flying manoeuvres in birds that have entered the turbine area in comparison to many active bird control measures.

3.2 Annual Assessment

Monitoring and evaluation by a suitably qualified environmental scientist, ornithologist or ecologist will be required to ensure the effectiveness of this Bird Mitigation Plan. Monitoring and evaluation of the Bird Mitigation Plan will be carried out in conjunction with the proposed Bird Monitoring Programme (refer to Appendix 7-8 Bird Monitoring Programme of this EIAR). The Bird Monitoring Programme proposes a suite of bird surveys and collision monitoring carcass searches to be conducted at the Site during operation, in line with best practice guidance. The findings of the Bird Monitoring Programme will provide further insight into the effectiveness of the Bird Mitigation Plan.

All of the mitigation fields will be monitored and evaluated each year. Monitoring will comprise:

- A field inspection;
- Monitoring adherence to the bird control kites;
- Reporting.

Field inspection

The mitigation fields will be visited by the overseeing environmental scientist, ornithologist or ecologist each year of operation. Four visits will be undertaken between October and March. The first visit will be in October to ensure that the bird control kites are in good repair and in place at the beginning of the winter season. The remaining visits should be spread throughout the winter. The purpose of these visits is to assess the effectiveness of the bird control kites in deterring golden plover from using these areas. As part of the assessment, it is useful to also record other properties of the field in relation to golden plover to provide a better understanding of the birds' response. Four properties of the field will be recorded:

1. Record the presence and condition of the bird control kites. Earmark any kites that need replacement.

2. Record (i) the percentage vegetation cover of grass versus other vegetation types (eg. scrub, woodland) and (ii) the average sward height of grass and in each field. Remark on its suitability for foraging and roosting golden plover.

3. Record the composition (e.g., fence, hedgerow, treeline), height and density of field boundaries. Remark on the features that may influence golden plover site selection such as 'openness' and sightlines.

4. Record features within the field: (i) flooding or standing water, with remarks on its accessibility to wading golden plover and (ii) the presence of livestock.

5. Record the presence, number, activity and habitat of any golden plover encountered. Also record flights of golden plover overhead, noting the distance from the nearest mitigation fields and nearest turbines.

Adherence to the Bird Mitigation Plan actions

Adherence to the Bird Mitigation Plan actions will be monitored each year during field inspections. In the event where the bird control kites are not being implemented in a mitigation field, the wind farm operator will be alerted by the overseeing environmental scientist, ornithologist or ecologist in a timely manner. Incomplete actions will be discussed with the wind farm operator with the aim of resolving the issue with the landowner.

Reporting

The findings of the field inspection will be assessed each year after the field visit to monitor the effectiveness of the actions. A discussion on the effectiveness of the Bird Mitigation Plan will be included in the Bird Monitoring Programme report that will be submitted to the Planning Authority at the end of each monitoring year. This report will also include the findings of operational monitoring bird surveys and dedicated searches for carcasses of birds that may have collided with turbines. It will be available on request by the National Parks and Wildlife Service or the Local Authority. The report should include any additional associated recommendations or adaptive management to be incorporated into the Bird Mitigation Plan.

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