FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

Appendix 3.4

Biodiversity Enhancement and Management Plan

Biodiversity Enhancement & Management Plan

Land Management & Monitoring Prescriptions

Ballinagree Wind Farm

Prepared for:

Ballinagree Wind farm

Prepared by:

Ecology Ireland Ltd.

ecologyireland

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Contents

Executive Summary

This Biodiversity and Environmental Management Plan has been prepared to outline a set of land management prescriptions (commitments and monitoring) as part of proposed Ballinagree Wind Farm Development. Four private landowners with a combined total of c. 304 ha of lands in the vicinity of the wind farm, but beyond 250m of any proposed turbine, have agreed to a long-term commitment to detailed land management measures designed to maintain and enhance local biodiversity. In addition, Coillte has undertaken to create wildlife corridors through strategic tree-felling between areas of upland habitat in the vicinity of the proposed wind farm area.

The measures include those designed to protect watercourses, prevent overgrazing and to clear invasive and site inappropriate plants. Higher value habitats will be actively managed to maintain and improve their value and lower value habitats will see specific interventions designed to improve their attractiveness for a wide range of species. Inputs (e.g. fertiliser, herbicide) will be controlled and appropriate planting will increase the available feeding, roosting and nesting cover for wildlife. Certain measures (e.g. control of stocking density) will be universal across the management lands. Other measures (e.g. planting of wildbird cover and native deciduous woodland) will be entirely site specific. The measures proposed for each land parcel take into account the habitats present and their current condition and importance in the local landscape.

The BEMP programme represents a significant commitment to enhance the biodiversity value and ecological connectivity across a large land bank. The programme will run for the lifetime of the windfarm and many of the proposed features (e.g. tree and hedgerow planting) will have a longer-lasting biodiversity benefit to the lands included in this plan and the wider locality. The BEMP is not designed to mitigate or address particular potential impacts associated with the construction, operation or decommissioning of the proposed wind farm. It is instead a commitment provided to yield a lasting biodiversity benefit to the area around Ballinagree.

1 Introduction

Ecology Ireland Wildlife Consultants Ltd. has prepared this Biodiversity Enhancement and Management Plan (BMP) for lands in the vicinity of the proposed Ballinagree Wind Farm. These lands include areas under the ownership of Coillte and also a number of private landholdings.

*Biodiversity is the **shortened form of two words "biological" and "diversity"**. It refers to all the variety of life that can be found on Earth (plants, animals, fungi and micro-organisms) as well as to the communities that they form and the habitats in which they live.*

The overall objectives of this plan are manifold but may be summarised as follows:

- To improve the ecological connectivity between patches of attractive habitat in the wider area
- To significantly increase the amount and quality of hedgerow across a number of landholdings
- To establish a number of high resource value habitats including hedgerows, small areas of native woodland and wildbird cover across the BEMP lands.
- To commit to biodiversity friendly farming practices through control of stocking densities, minimising the use of herbicides and pesticides and to protect watercourses from livestock.
- To erect and maintain bird and bat boxes and night roosts for Lesser Horseshoe Bats.
- Monitoring of local biodiversity and the implementation of the biodiversity prescriptions through the lifetime of the wind farm.

The BEMP is not designed to mitigate or address particular potential impacts associated with the construction, operation or decommissioning of the proposed wind farm. It is instead a commitment provided to yield a lasting biodiversity benefit to the area around Ballinagree. The measures will benefit a range of habitats and species through prescriptions that have been developed with the agreement and input of all participants in the BEMP. The commitments herein are wide-ranging but built upon established land management measures that have been developed as part of agri-environmental and biodiversity management schemes.

Coillte lands

Coillte has extensive lands under their ownership in and adjacent to the proposed wind farm area. Conifer plantation is a dominant local habitat and at an early stage in the development of the BEMP an opportunity to improve connectivity between open areas of heath/bog upland was identified. This will be achieved by felling corridors (wildlife corridors) through large blocks of existing mature conifer plantation. These corridors once cleared will be maintained to improve the connectivity between patches of upland peatland habitat.

An **ecological corridor** is a clearly defined geographical space that is governed and managed over the long-term to maintain or restore effective ecological connectivity.

Private Lands

A number of local landowners have also been instrumental to the development of the BEMP for private farmland. They have discussed and agreed to adopt a series of land management prescriptions on their own landholdings in the vicinity of the proposed wind farm development. Farm specific plans have been prepared with the input of the landowners to maximise the potential biodiversity gain at each site, dependent on the habitats present and their condition (see Sections 3-6 of this report). Each of the private land holdings has a significant amount of grassland, including improved agricultural grassland (GA1). Several have more upland habitats, including some areas of Annex 1 habitat (e.g. Wet Heath).

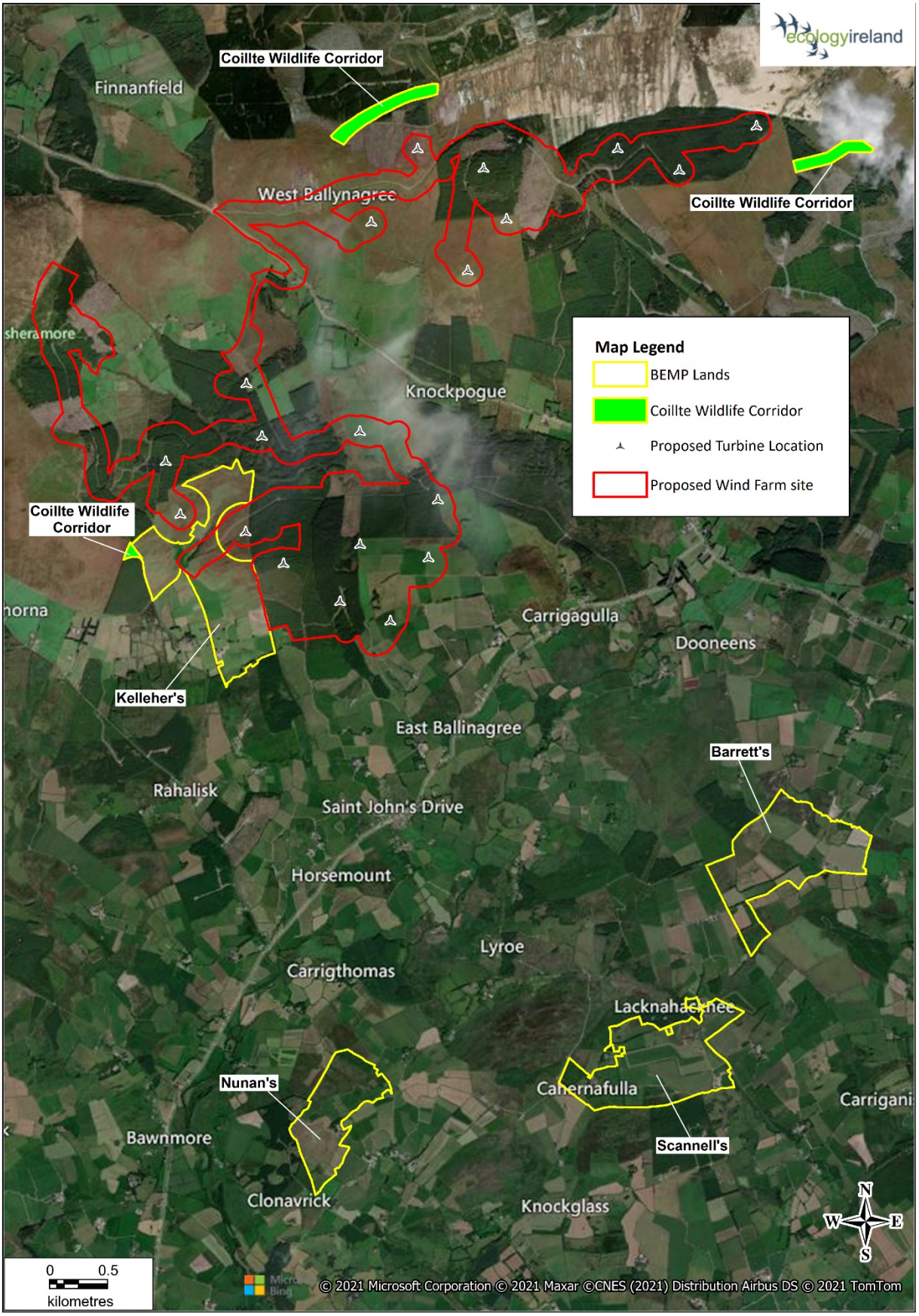
All lands, both private and public, that are included in the BEMP are over 250m from the proposed turbine locations. It was decided not to include lands closer to active turbines on a precautionary basis. If these lands (close to turbines) were actively managed to become more attractive for birds and bats (for instance) there could be a perceived marginal increase in collision risk for such individuals.

The location of the lands included in this BEMP are shown in Figure 1. This includes three wildlife corridors that will be created and maintained on Coillte lands and also four individual land holdings. Table 1 summarises the area of each of the land parcels in this BEMP. The overall area of lands which are included in this plan totals over 322 hectares.

Table 1. Areas of each land parcel included in the BEMP

Land Parcel	Area (ha)
Coillte wildlife corridor (northwest)	10.38
Coillte wildlife corridor (northeast)	6.63
Coillte wildlife corridor (west)	0.99
Kelleher's lands	92.14
Nunan's lands	47.32
Scannell's lands	81.82
Barrett's lands	82.98
Total Area	**322.26**

Figure 1. Land areas included in the BEMP.



2 Background to Biodiversity Management Strategy

This section presents information on the overall habitat makeup of the lands under consideration and explains what measures are appropriate for the habitats present across the land holdings. As illustrated in Figure 1, the three Coillte Wildlife Corridors are located in the vicinity of the proposed wind farm site and these corridors are designed to improve ecological connectivity between areas of upland heath/bog. The north-western of the three corridors is approximately 10.4 hectares in area, the north-eastern corridor is somewhat smaller at 6.6ha and the third corridor will be created by clearance of 0.99 ha of plantation forestry to the west of the proposed wind farm development. Lands permanently felled for this purpose will be replanted elsewhere as described in Chapter 3 of the EIAR.

There are four private landholdings included in the BEMP lands. The largest of these is Anthony Kelleher's (92 ha) and this is located closest to the proposed wind farm site. Three landholdings south of the proposed wind farm are also included. None of the landholdings are located within or adjacent to any designated conservation site. The dominant habitat across these land holdings is Improved Agricultural Grassland (GA1).

Improved Agricultural Grassland (GA1) is a habitat with generally low ecological value and as such it especially suitable for basic land management prescriptions (e.g. control of stocking, planting of hedges etc.). Provision of wildbird cover (sacrificial crop) and prescriptions in line with the All-Ireland Pollinator Plan are also typically appropriate for GA1 lands. There are also significant areas of Wet Grassland (GS4) and related habitats in these land parcels and these present an opportunity to control the extent of soft rush growth and implement other biodiversity positive features. Measures associated with rush control are included in the plans for the private lands included in the BEMP (see Sections 3-6).

Areas of degraded Wet Heath (HH3) and Cutover Bog (PB4) where present (on Kelleher's lands) are suitable for land management as these are habitats that can be greatly improved with appropriate management. Lands running by watercourses are already (at least in part) managed to control livestock access. This will be formalised in some instances with fencing and livestock exclusion.
All private land holdings were walked and the proposed land management prescriptions discussed with the individual landowners. Each landowner has given formal consent to the developer to participate in the BEMP and to implement a range of management measures as discussed in this report. This represents a considerable commitment across the lifetime of the wind farm. Other proposed prescriptions discussed and agreed with each of the landowners include commitments to provide nesting/roosting opportunities for Barn Owl and bats at appropriate locations.

2.1 Biodiversity Best Practice

There are several advice and best practice documents and online resources that have been used in the preparation of this document. These include:

- European Commission (2008). Management of Natura 2000 habitats Northern Atlantic wet heaths with *Erica tetralix* 4010. Technical Report 08/24.

- National Red Grouse Steering Committee (2013). Red Grouse Species Action Plan. Available on www.npws.ie
- Hen Harrier Project (2020). Hen Harrier Programme Supporting Actions. 2nd Edition, 2020.
- Sears/Natural Scotland (2008). Bracken Control: Guide to Best Practice.
- Freshwater Habitats Trust (UK) – Pond Creation Toolkit https://freshwaterhabitats.org.uk/projects/million-ponds/pond-creation-toolkit/#Core%20factsheets
- The All-Ireland Pollinator Plan. https://pollinators.ie/
- Hickey, S., Sheehan, D. & Nagle, T. (2020). Bride Project EIP: Farm Management Guidelines. Guide to Farming with Nature. Available https://www.thebrideproject.ie/wp-content/uploads/2020/04/BRIDE-Project-Farm-Habitat-Management-Guidlines.pdf

2.2 BEMP Management

A BEMP liaison officer will be nominated by the developer to act as a point of contact and manager for the implementation of the scheme. They will ensure that the commitments provided herein are monitored and implemented and that all participants (private landowners, Coillte) are kept updated on the progress of the BEMP. The liaison officer will act as an intermediary between the developer's ecologist and the individual landowners. Regular project review meetings will be held, particularly in the early establishment years of the scheme and advice and support will be provided as appropriate to the participants in the BEMP.

Further detail relating to the commitments provided in this BEMP and the timeline for the delivery of individual prescriptions will be discussed and agreed within 6 months of the grant of planning permission. The bulk of the interventions (planting, fencing etc.) will be achieved in the first three years from the grant of planning. The individual farm-level agreements will cover an initial 5-year period and will set measurable targets for each land holding which will be monitored and reported upon during this early establishment phase. This 5-year Action Plan will be published on a dedicated website that will be established and maintained for the duration of the project. Annual reports will be prepared and measure the progress towards targets (e.g. planting of new hedgerow) and provide an update on ecological monitoring carried out in the area during this initial 5-year establishment phase. At the end of the first 5-year plan an updated Action Plan will be prepared and agreed with the participating landowners. This will see the continuation of land management and maintenance of the various biodiversity prescriptions already in place for the remainder of the wind farm permission period. The lands will be subject to annual ecological surveys (audit of BEMP measures) throughout the lifetime of the windfarm. Key results and updates will be published on the BEMP website.

The following sections summarise the biodiversity enhancement measures that will be implemented by each of the landowners.

2.3 Overall BEMP commitments for lifetime of windfarm

A critical part of a Biodiversity Enhancement and Management strategy is to commit to strategies to manage the land that will promote the maintenance of the high value features and improve the overall biodiversity through active management and monitoring of the lands.

To achieve this there are lots of possible management actions that can be considered. Some are focussed on a particular species (e.g. erection a nest box) or habitat (e.g. preventing livestock entering watercourses) and other measures have a more general focus e.g. limiting stocking density.

There shall be none of the following allowed on the lands included in the BEMP:

- Burning areas of vegetation.
- Removal of hedgerows.
- Planting of Conifers.
- New land drainage.
- Organising, allowing or engaging in recreational activities involving off-road or racing vehicles.
- Turf-cutting.
- Unapproved use of Herbicides.
- Unapproved of pesticides/rodenticides.

Common Management Measures:

For all of the BEMP areas, the following measures are to be applied:

- Removal of all self-sown conifer saplings
- Removal of all invasive non-native species, notably *Rhododendron*
- Control of Bracken (according to Sears/Natural Scotland (2008). Bracken Control: Guide to Best Practice).

3 Anthony Kelleher's lands

Anthony Kelleher's farm is shown in Figure 3.1. Note lands within 250m of any proposed turbine are not included as these are not to be included in the proposed Biodiversity Land Areas. The land has a good range in elevation from about 240mOD in the south to over 390mOD at the high point of the west of the farm.

The Knocknagappul Stream runs through the northern section of the land holding. The West Ballinagree Stream joins the Knocknagappul and in turn enters the River Laney within the northeast corner of the farm. The farm contains extensive areas of Annex I habitat, predominantly Wet Heath (HH3), particularly in the north (see Figure 3.2). There is also a good amount of degraded Wet Heath and areas of dry-humid Acid Grassland (GS3). The northern part of the land holding has a range of habitats including an area of Semi-Natural Woodland/Poor Fen & Flush (WN/PF2). The southern part of the farm is dominated by Improved Agricultural Grassland (GA1).

The BEMP measures include core commitments for grassland management, particularly for the Improved Agricultural Grassland (GA1) but also some additional options to provide greater benefits for local wildlife (e.g. provision of Wild Bird Cover crop and planting of native tree species). These are all described in Section 3.1-3.5 below

The total area of the Kelleher lands included in the BEMP amounts to 92.14 ha.

Figure 3.1 Kelleher's lands

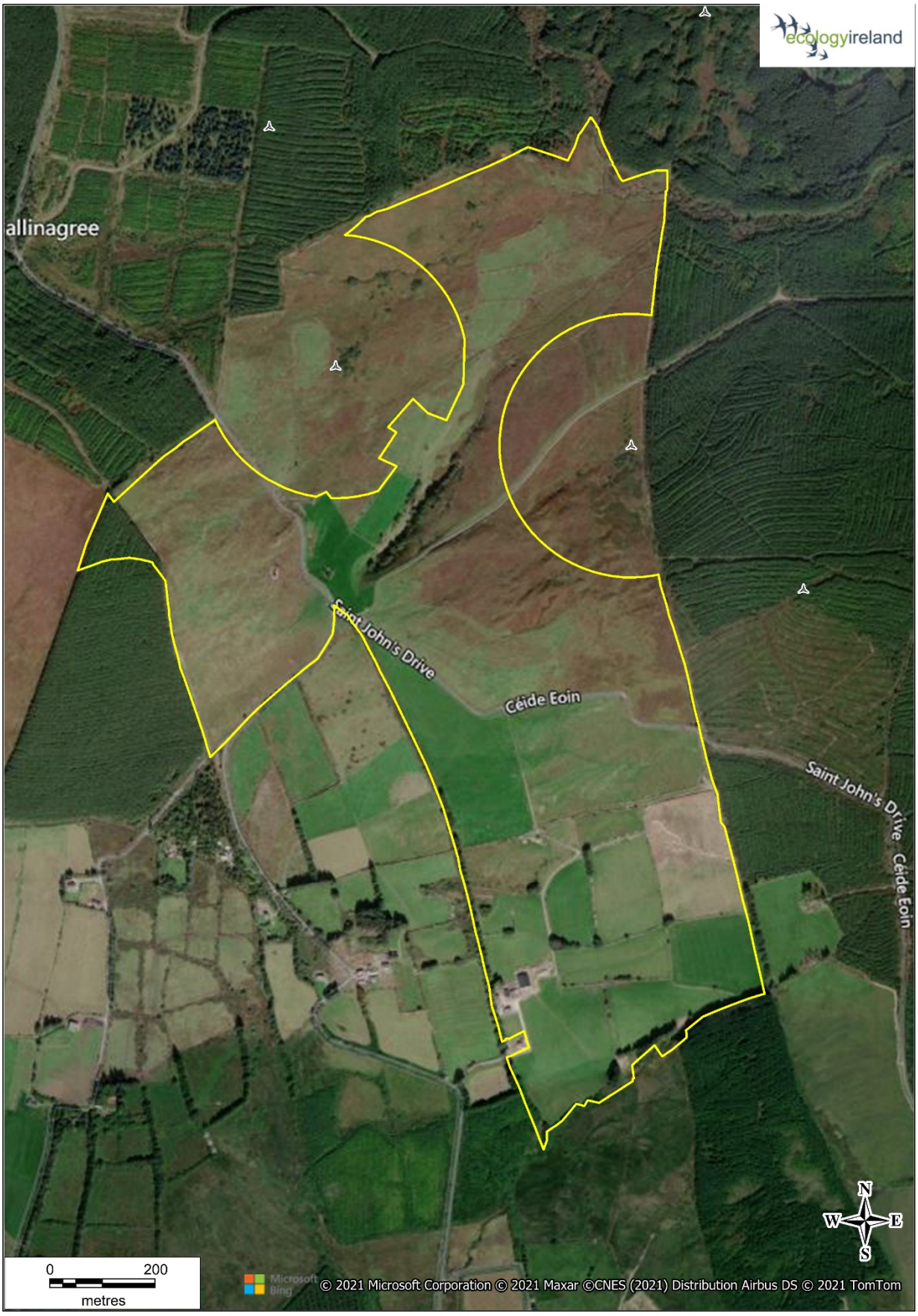
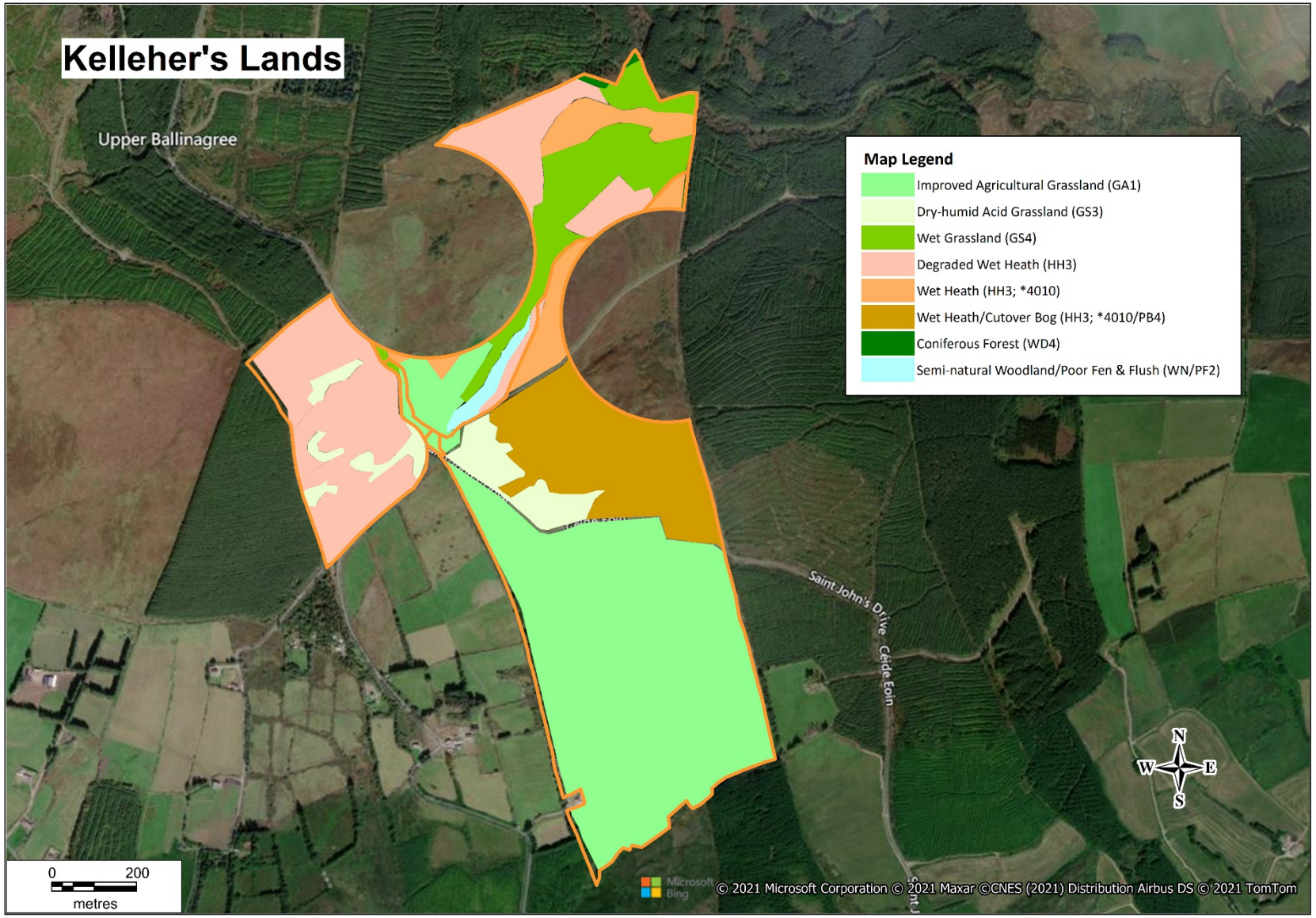


Figure 3.2 Habitat Map – Kelleher's Lands



3.1 Management of Grassland Habitats (GA1/GS4/GS3)

These measures will apply to areas of agricultural grassland as per Figure 3.2 above (GA1/GS3 and GS4). Stocking measures apply to all of the grassland areas, as does rush management and hedgerow management. Figure 3.3 shows the indicative extent of each of the following land management prescriptions that have been agreed in principle with Mr. Anthony Kelleher.

Stocking & Grassland Management

Grazing of the agricultural fields included in this BEMP option will be by cattle/sheep with a target low stocking density of 0.5 LU/Ha (this stocking density will not exceed 0.7 LU/Ha without agreement). The aim is to maintain a tussocky sward. This will help create conditions for ground nesting birds such as Meadow Pipit and Skylark. Supplementary feeding of stock with hay in the winter can take place, but feeding areas (e.g. ring feeders) will be moved around the fields regularly to prevent poaching of the ground. Supplementary feed can provide seeds and feeding opportunities for wintering passerines.

i. Rush management. Rushes within the agricultural fields will not be allowed to grow to the extent that they rush tussocks collapse and form mats that can smother the ground vegetation. Rotational cutting, i.e. cutting every other year should be sufficient to maintain these levels. Rush cutting in the fields and rough grassland areas should aim to maintain rush levels at 30-70% cover. Approved herbicide application (direct application – licking) will be permitted to combat persistent high levels of rush cover.
    a) All rush cuttings will be removed from the treated fields. Topping will be delayed until after mid-July to minimise the risk to ground-nesting birds. In fields with a heavy soft-rush infestation (>60% cover) a second cut, four to eight weeks after the initial topping, will help to reduce rush cover in the following year. Reducing and maintaining rush cover at below 50% cover in areas initially with 60% and more cover will be a target.
    b) It may be impractical to cut rushes in the wetter or rockier fields, so these may be left if they form a small proportion of the field area, or they can be controlled by cattle trampling during aftermath grazing.

Hedgerow Planting/Hedgerow management/Fencing

Hedgerows will be planted according to the advice in Appendix A of this report and as indicatively illustrated in Figure 3.3. The extent of new hedgerow establishment shown would be c. 5km. In addition, existing hedgerows will be protected by stock-proof fencing and bolstered where appropriate by supplemental planting. Stock-proof fencing/electric fencing will be erected a minimum of 3m from the base of the established hedgerows.

Existing hedgerows are to be managed to provide hedges with thick (minimum 2m wide) bases. Hedges will be cut to provide an A-shape, wider at the base with the aim to create hedges that are a minimum of 2m wide at the base and 2.5m high. All hedgerow cutting is to take place in the period 1st September to 28th February, i.e. outside the bird breeding season. Any existing areas of scrub found within the grassland fields are to be retained. Trimming of the scrub can be undertaken to prevent encroachment into the surrounding areas. Hedgerow management advice from the All-Ireland Pollinator Plan will be followed (see Appendix A).

Livestock will be prevented from accessing natural watercourses by stock-proof fencing. As per the Bride Project "*In times past, before the advent of piped water, cattle and other livestock, used ponds, rivers and other water sources for drinking. Nowadays, increased and more concentrated numbers of livestock can cause siltation, bank erosion and water pollution at watercourse drinking points. If possible, water should be piped to troughs, located away from the river, to prevent these problems. Alternatively, the use of nose pumps or pasture pumps can be an effective alternative to river access, especially for smaller numbers of animals*." An indicative map showing the principal watercourses where they intersect the BEMP lands is shown in Figure 3.3 below. All fencing will be renewed and maintained as required during the lifetime of the wind farm.

3.2 Wild Bird Cover

Under this option a larger area of a field (or entire fields) of Improved Agricultural Grassland will be planted and maintained to provide wild bird cover. This will be sown with an appropriate seed mix (to be approved by the project ecologist). The indicative mapping shows an area of 3.1ha under wild bird cover.

Oat & Linseed mixes can be sown each year and grow well in all soil types, but the seed mix chosen will be discussed and agreed with the project ecologist. Areas of wild bird cover will be fenced to prevent access by livestock. The areas need to be sown before the 31st May except in exceptionally wet years. The crop is left in situ through the winter period at least until mid-March. An outline document on the wild bird cover management is provided in Appendix B.

The location of the area sown can be rotated from year to year but the amount of wild bird cover will be maintained at a minimum of 3ha during the project. Management options and sowing density will be discussed and agreed with the project ecologist.

3.3 Management of Upland Heath/Bog Habitats

Areas of peatland which will be managed to have a low stocking density are shown in Figure 3.3.

The management of grazing pressure is critical to the health and diversity of these upland habitats. To bring degraded wet heath and blanket bog into favourable condition (see EC 2008):

- a maximum year-round stocking rate of around 0.1 sheep/ha or 0.015 LUs/ha has been recommended for degraded Wet Heath/Cutover Bog, with winter levels lower still, or stock entirely removed from these areas from November-February;

Any extant land drains in this habitat will be blocked according to the advice of the project ecologist. This option also requires reliable stock fencing and control in areas where this management measure is to be applied. Annual monitoring of the heath/bog habitats included in the BEMP area will confirm the success of the management measures and make further recommendations as needed in relation to any interventions required.

To maintain intact wet heath (and blanket bog) in favourable condition undisturbed wet heaths and blanket bog requires little active management. However, it is necessary to control grazing pressure. Light or no grazing in the autumn or winter, with at most very light grazing in the summer is the ideal grazing regime (EC 2008).

- Year-round stocking rates should not exceed 0.25-0.5 ewes/ha or 0.037-0.075 LUs/ha;
- Winter stocking rates should be reduced by at least 25%, with all cattle and horses removed where there is a risk of poaching;
- Blanket bog or Wet Heath dominated by *Molinia* (Purple Moor Grass) will be better grazed with cattle or ponies in the spring and summer months, as this will reduce the dominance of this grass over time and aid restoration.

Particular attention to be given to the encroachment of scrub on higher value (Annex I) habitats. Scrub clearance (outside the bird nesting season) in the peatland habitats will be carried out manually if and when this is required – the use of plant will be avoided except for low ground pressure and light vehicles. Similarly, any encroaching self-seeded saplings and invasives will be prioritised for removal from Heath/Peatland habitats.

3.4 Erection of Bird and Bat Nest Boxes & Bat Roost

Under this option an external Barn Owl nest box will be erected at an agreed location either on a tree or on a pole specifically installed for this purpose. An additional Barn Owl box will be installed in an appropriate location within a farm building within the landholding area.

Barn Owl Box in situ (Credit Barn Owl Trust).

A minimum of 10 recycled plastic/woodcrete bird nest boxes will be erected at locations selected by the project ecologist. The type and specification of the boxes will be chosen to be appropriate to the habitats present. These boxes will be inspected and maintained regularly throughout the project.

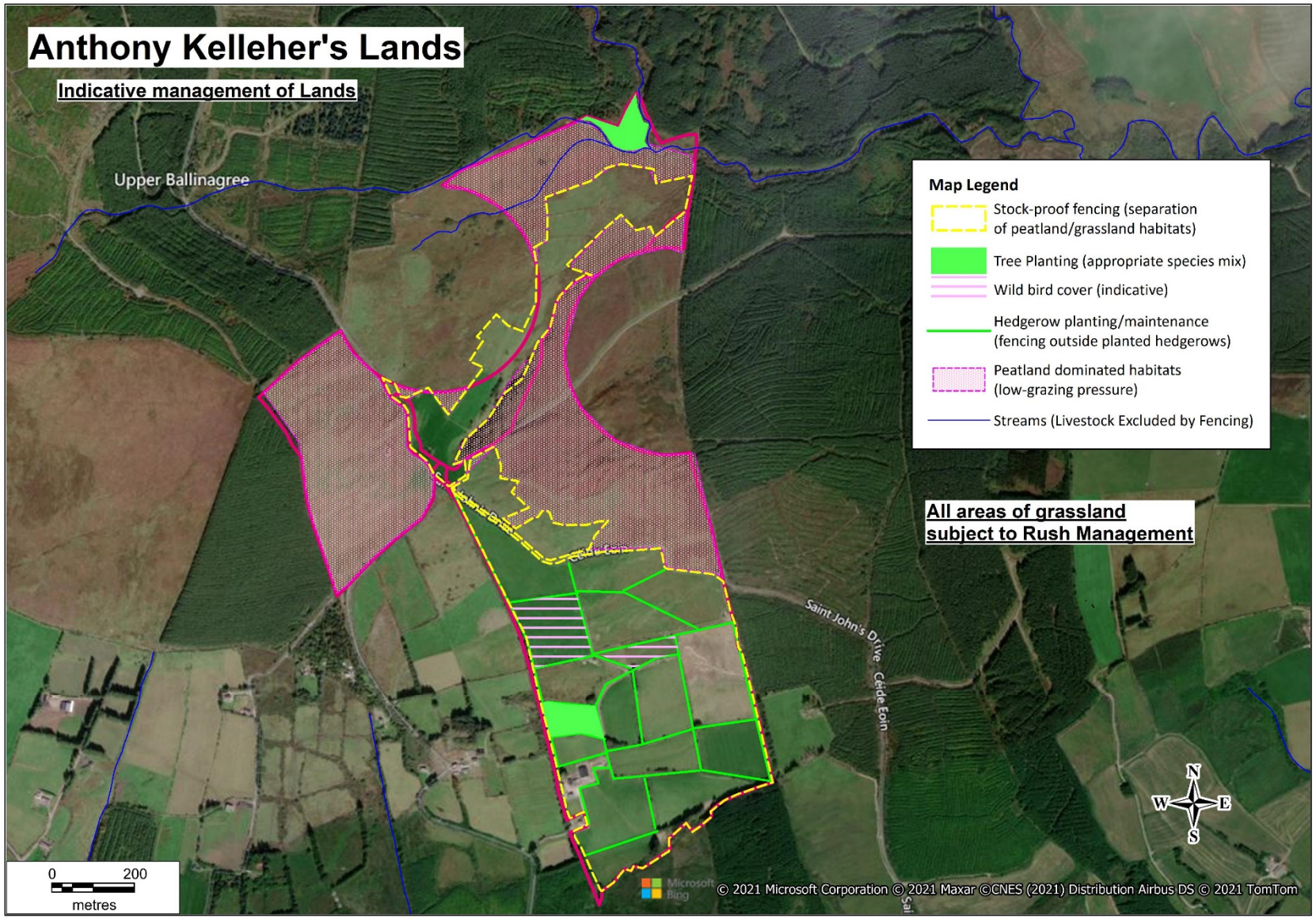
A minimum of five recycled plastic/woodcrete bat roost boxes will be erected and maintained at sites selected by the project ecologist. These will be inspected annually by a licensed bat specialist. In addition, two Lesser Horseshoe Bat Night Roost structures (see Appendix D) will be installed at selected and agreed locations within the landholding.

3.5 Establishing a Patch of Native Woodland

This option will involve the establishment of 2 copses of native woodland (see indicative mapping in Figure 3.3). As shown the total of indicative tree-planting is 1.8ha.

This will involve the planting two patches of woodland (using native species) to increase the local biodiversity. Native woodland patches provide food and cover for wildlife. Many biodiversity plans for farmland include provision for establishment of native woodland. For example, the Bride Valley Project Farm Management Guidelines are provided in Appendix D. The location and extent of planting, as well as the appropriate species mix will be agreed with the input of the Project Ecologist.

Figure 3.3 Summary of indicative BEMP commitments for Kelleher's lands.



4 Noel Nunan's lands

Noel Nunan's landholding of 47.3 ha is shown in Figure 4.1. It is dominated by improved and semi-improved grassland currently grazed by dry cattle stock. There is an area of forestry at the north of the land parcel. There is no significant watercourse within this land holding.

4.1 Management of Grassland Habitats

These measures will apply to areas of agricultural grassland. Stocking measures apply to all of the grassland areas, as does rush management and hedgerow management. Figure 4.2 shows the indicative extent of each of the following land management prescriptions that have been agreed in principle with Mr. Noel Nunan.

Stocking & Grassland Management

Grazing of the agricultural fields included in this BEMP option will be by cattle/sheep with a target low stocking density of 0.5 LU/Ha (this stocking density will not exceed 0.7 LU/Ha without agreement). The aim is to maintain a tussocky sward. This will help improve conditions for ground nesting birds such as Meadow Pipit and Skylark. Supplementary feeding of stock with hay in the winter can take place, but feeding areas (e.g. ring feeders) will be moved around the fields regularly to prevent poaching of the ground. Supplementary feed can provide seeds and feeding opportunities for wintering passerines.

ii. Rush management. Rushes within the agricultural fields will not be allowed to grow to the extent that they rush tussocks collapse and form mats that can smother the ground vegetation. Rotational cutting, i.e. cutting every other year should be sufficient to maintain these levels. Rush cutting in the fields and rough grassland areas should aim to maintain rush levels at 30-70% cover. Approved herbicide application (direct application – licking) will be permitted to combat persistent high levels of rush cover.

   a) All rush cuttings will be removed from the treated fields. Topping will be delayed until after mid-July to minimise the risk to ground-nesting birds. In fields with a heavy soft-rush infestation (>60% cover) a second cut, four to eight weeks after the initial topping, will help to reduce rush cover in the following year. Reducing and maintaining rush cover at below 50% cover in areas initially with 60% and more cover will be a target.
   b) It may be impractical to cut rushes in the wetter or rockier fields, so these may be left if they form a small proportion of the field area, or they can be controlled by cattle trampling during aftermath grazing.

Hedgerow Planting/Hedgerow management/Fencing

The existing hedgerow network within this land holding is relatively extensive. New hedgerows will be planted according to the advice in Appendix A of this report and as indicatively illustrated in Figure 4.2. The extent of new hedgerow establishment shown would be c. 1.9km.

In addition, existing hedgerows will be protected by stock-proof fencing and bolstered where appropriate by supplemental planting. Stock-proof fencing/electric fencing will be erected a minimum of 3m from the base of the established hedgerows. All fencing will be renewed and maintained as required during the lifetime of the wind farm.

Existing hedgerows are to be managed to provide hedges with thick (minimum 2m wide) bases. Hedges will be cut to provide an A-shape, wider at the base with the aim to create hedges that are a minimum of 2m wide at the base and 2.5m high. All hedgerow cutting is to take place in the period 1st September to 28th February, i.e. outside the bird breeding season. Any existing areas of scrub found within the grassland fields are to be retained. Trimming of the scrub can be undertaken to prevent encroachment into the surrounding areas. Hedgerow management advice from the All-Ireland Pollinator Plan to be followed (see Appendix A).

4.2 Wild Bird Cover

Under this option a larger area of a field (or entire fields) of Improved Agricultural Grassland will be planted and maintained to provide wild bird cover. This will be sown with an appropriate seed mix (to be approved by the project ecologist). The indicative mapping shows an area of 2.6ha under wild bird cover.

Oat & Linseed mixes can be sown each year and grow well in all soil types, but the seed mix chosen will be discussed and agreed with the project ecologist. Areas of wild bird cover will be fenced to prevent access by livestock. The areas need to be sown before the 31st May except in exceptionally wet years. The crop is left in situ through the winter period at least until mid-March. An outline document on the wild bird cover management is provided in Appendix B.

The location of the area sown can be rotated from year to year but the amount of wild bird cover will be maintained at a minimum of 2ha during the project. Management options and sowing density will be discussed and agreed with the project ecologist.

4.3 Erection of Bird and Bat Nest Boxes & Bat Roost

Under this option an external Barn Owl nest box will be erected at an agreed location either on a tree or on a pole specifically installed for this purpose.

A minimum of 10 recycled plastic/woodcrete bird nest boxes will be erected at locations selected by the project ecologist. The type and specification of the boxes will be chosen to be appropriate to the habitats present. These boxes will be inspected and maintained regularly throughout the project.

A minimum of five recycled plastic/woodcrete bat roost boxes will be erected and maintained at sites selected by the project ecologist. These will be inspected annually by a licensed bat specialist. In addition, one Lesser Horseshoe Bat Night Roost structures (see Appendix D) will be installed at an agreed location within the landholding.

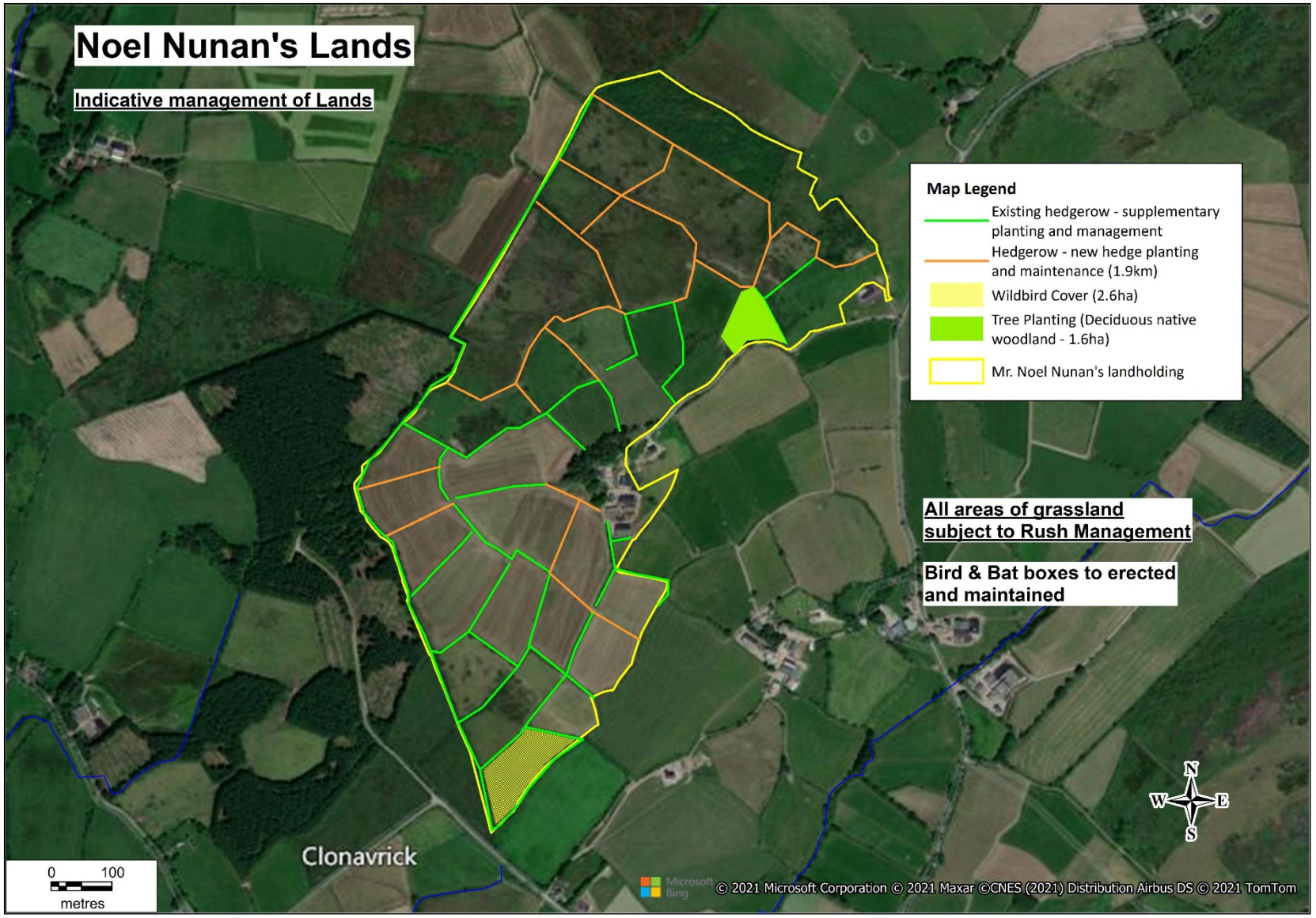
4.4 Establishing a Patch of Native Woodland

This option will involve the establishment of a copse (or copses) of native woodland (see indicative mapping in Figure 4.2). As shown the total of indicative tree-planting is 1.6 ha.

This option will involve the planting an area of woodland (using native species) to increase the local biodiversity. Native woodland patches provide food and cover for wildlife. Many biodiversity plans for farmland include provision for establishment of native woodland. For example, the Bride Valley Project Farm Management Guidelines are provided in Appendix D. The location and extent of planting, as well as the appropriate species mix will need to be agreed with the input of the Project Ecologist.

Figure 4.1 Nunan's lands included in the BEMP.

Figure 4.2 Summary of indicative BEMP commitments for Nunan's lands.



5 James Scannell's lands

James Scannell's land holding of 81.8 ha is shown in Figure 5.1. It is dominated by improved cattle-grazed agricultural grassland with relatively large fields and low-quality hedgerows. There is an area of forestry at the southwest of the land parcel. The land is fairly intensively managed at present and there are a series of internal farm tracks throughout the land holding. There are a number of watercourses within and directly adjacent to the land, including the Glashagarriff River and a number of minor tributaries.

5.1 Management of Grassland Habitats

These measures will apply to areas of agricultural grassland. Stocking measures apply to all of the grassland areas, as does rush management and hedgerow management. Figure 5.2 shows the indicative extent of each of the following land management prescriptions that have been agreed in principle with Mr. James Scannell.

<u>Stocking & Grassland Management</u>

Grazing of the agricultural fields included in this BEMP option will be by cattle/sheep with a target low stocking density of 0.5 LU/Ha (this stocking density will not exceed 0.7 LU/Ha without agreement). The aim is to maintain a tussocky sward. This will help improve conditions for ground nesting birds such as Meadow Pipit and Skylark. Supplementary feeding of stock with hay in the winter can take place, but feeding areas (e.g. ring feeders) will be moved around the fields regularly to prevent poaching of the ground. Supplementary feed can provide seeds and feeding opportunities for wintering passerines.

iii. Rush management. Rushes within the agricultural fields will not be allowed to grow to the extent that they rush tussocks collapse and form mats that can smother the ground vegetation. Rotational cutting, i.e. cutting every other year should be sufficient to maintain these levels. Rush cutting in the fields and rough grassland areas should aim to maintain rush levels at 30-70% cover. Approved herbicide application (direct application – licking) will be permitted to combat persistent high levels of rush cover.

   a) All rush cuttings will be removed from the treated fields. Topping will be delayed until after mid-July to minimise the risk to ground-nesting birds. In fields with a heavy soft-rush infestation (>60% cover) a second cut, four to eight weeks after the initial topping, will help to reduce rush cover in the following year. Reducing and maintaining rush cover at below 50% cover in areas initially with 60% and more cover will be a target.
   b) It may be impractical to cut rushes in the wetter or rockier fields, so these may be left if they form a small proportion of the field area, or they can be controlled by cattle trampling during aftermath grazing.

<u>Hedgerow Planting/Hedgerow management/Fencing</u>

The existing hedgerow network within this land holding is fairly extensive but of fairly low-quality. There is considerable opportunity for hedgerow planting and management on these lands.

New hedgerows will be planted according to the advice in Appendix A of this report and as indicatively illustrated in Figure 5.2. Up to 7km of new or mostly new hedgerow will be established as shown in Figure 5.2. In addition, existing hedgerows will be protected by stock-proof fencing and bolstered where appropriate by supplemental planting. Stock-proof fencing/electric fencing will be erected a minimum of 3m from the base of the established hedgerows. Stock-proof fencing will be erected to exclude livestock from accessing the watercourses that run through the land holding. All fencing will be renewed and maintained as required during the lifetime of the wind farm.

Existing hedgerows are to be managed to provide hedges with thick (minimum 2m wide) bases. Hedges will be cut to provide an A-shape, wider at the base with the aim to create hedges that are a minimum of 2m wide at the base and 2.5m high. All hedgerow cutting is to take place in the period 1st September to 28th February, i.e. outside the bird breeding season. Any existing areas of scrub found within the grassland fields are to be retained. Trimming of the scrub can be undertaken to prevent encroachment into the surrounding areas. Hedgerow management advice from the All-Ireland Pollinator Plan to be followed (see Appendix A).

Figure 5.2 also show an indicative tree-line field boundary that will be established to border an existing farm track. As shown, this will see the establishment of a native tree dominated tree-line of c. 1.7km in length.

5.2 Wild Bird Cover

Under this option a larger area of a field (or entire fields) of Improved Agricultural Grassland will be planted and maintained to provide wild bird cover. This will be sown with an appropriate seed mix (to be approved by the project ecologist). The indicative mapping shows an area of 4.6ha under wild bird cover.

Oat & Linseed mixes can be sown each year and grow well in all soil types, but the seed mix chosen will be discussed and agreed with the project ecologist. Areas of wild bird cover will be fenced to prevent access by livestock. The areas need to be sown before the 31st May except in exceptionally wet years. The crop is left in situ through the winter period at least until mid-March. An outline document on the wild bird cover management is provided in Appendix B.

The location of the area sown can be rotated from year to year but the amount of wild bird cover will be maintained at a minimum of 4ha during the project. Management options and sowing density will be discussed and agreed with the project ecologist.

5.3 Erection of Bird and Bat Nest Boxes & Bat Roost

Under this option an external Barn Owl nest box will be erected at an agreed location either on a tree or on a pole specifically installed for this purpose. If a suitable additional site is available on farm buildings a second Barn Owl box will be erected within the land holding.

A minimum of 10 recycled plastic/woodcrete bird nest boxes will be erected at locations selected by the project ecologist. The type and specification of the boxes will be chosen to be appropriate to the habitats present. These boxes will be inspected and maintained regularly throughout the project.

A minimum of five recycled plastic/woodcrete bat roost boxes will be erected and maintained at sites selected by the project ecologist. These will be inspected annually by a licensed bat specialist. In addition, two Lesser Horseshoe Bat Night Roost structures (see Appendix C) will be installed at selected agreed locations within the landholding.

Figure 5.1 Scannell's lands included in the BEMP.

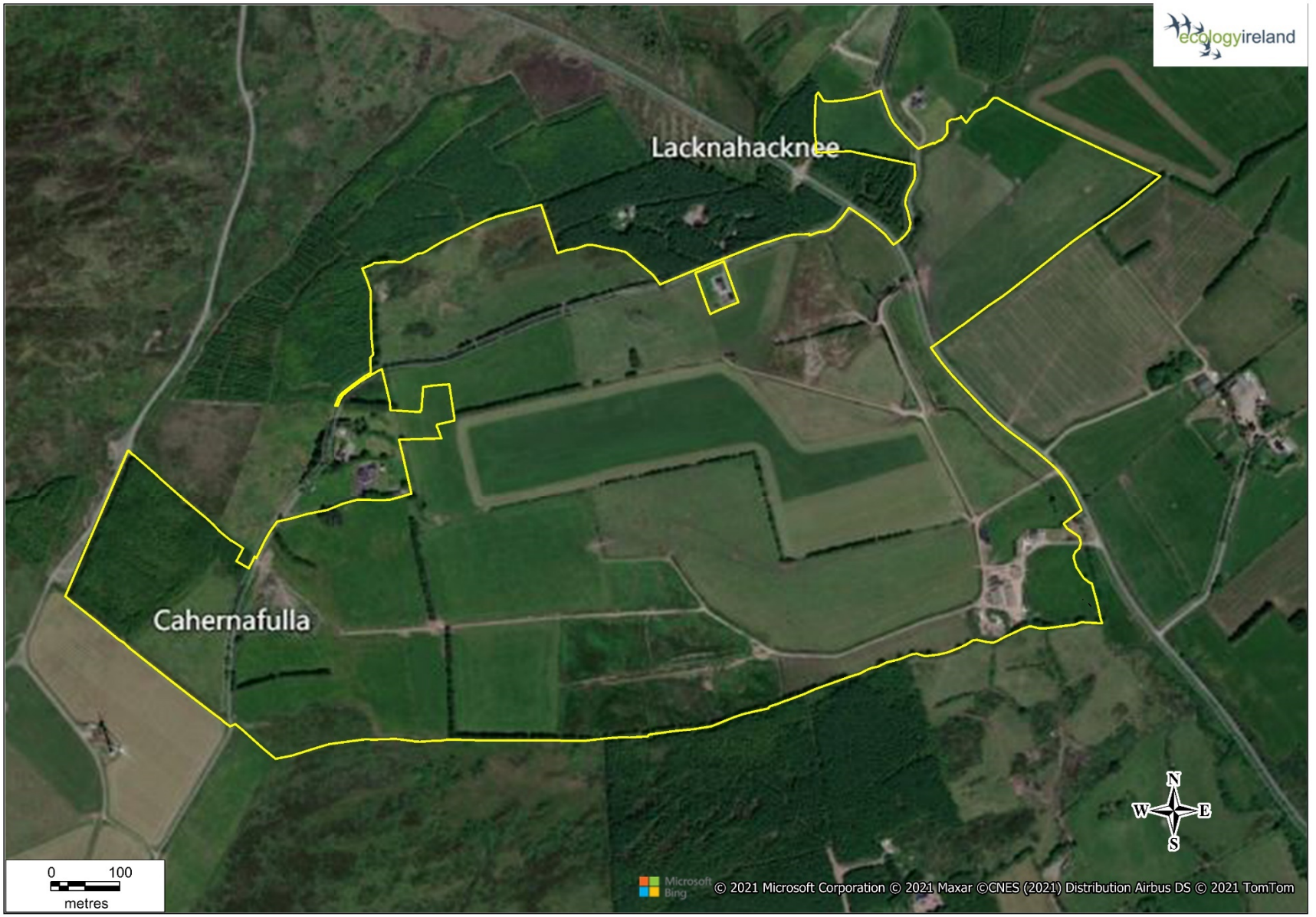
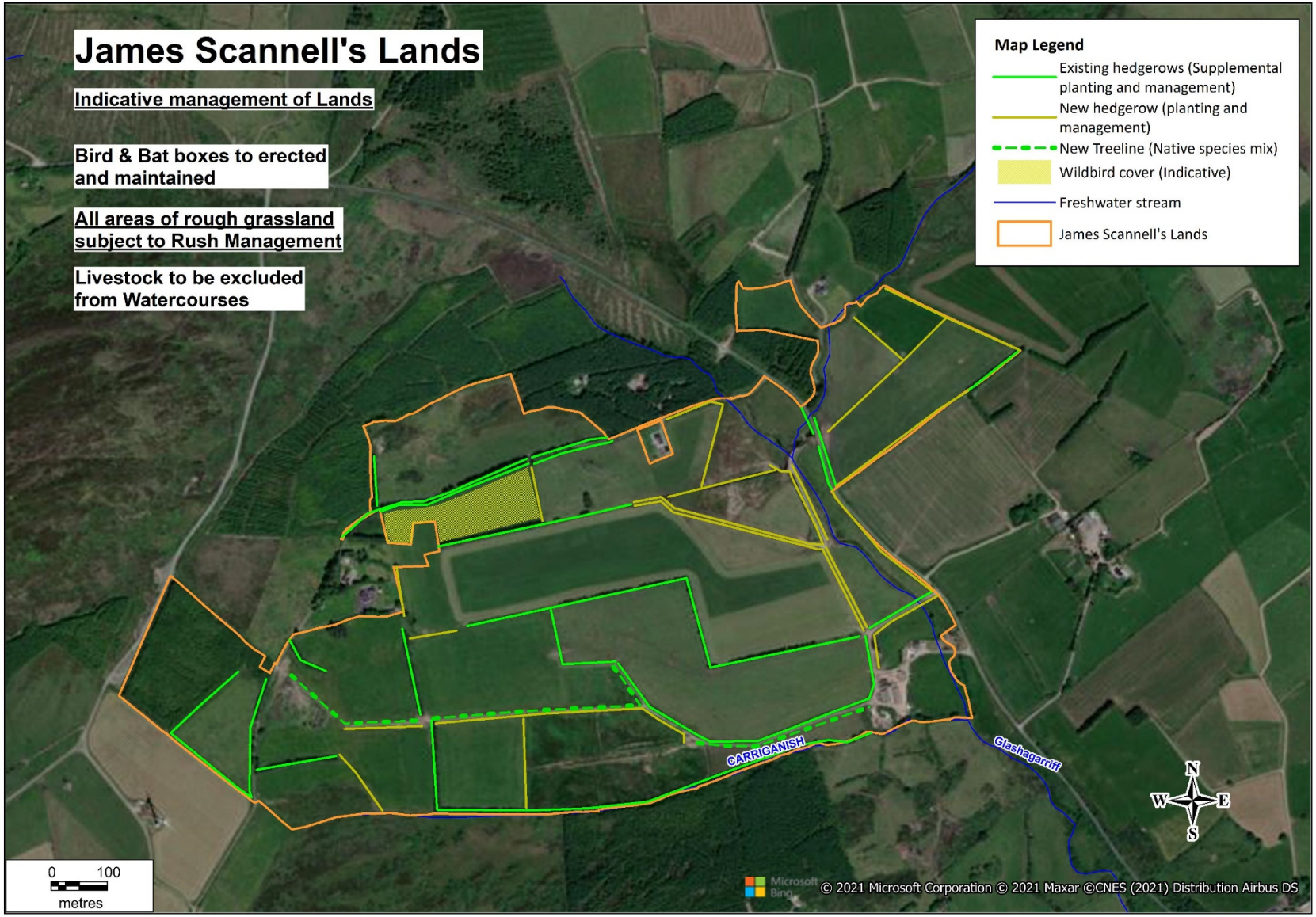


Figure 5.2 Summary of indicative BEMP commitments for Scannell's lands.



6 Joseph Barrett's lands

Joseph Barrett's land holding of c. 83 ha is shown in Figure 6.1. It is dominated by improved agricultural grassland with a fairly extensive existing hedgerow network of variable quality. The land is fairly intensively managed and the field size is relatively large. A small watercourse flows along the northern boundary of the land holding.

6.1 Management of Grassland Habitats

These measures will apply to areas of agricultural grassland. Stocking measures apply to all of the grassland areas, as does rush management and hedgerow management. Figure 6.2 shows the indicative extent of each of the following land management prescriptions that have been agreed in principle with Mr. Joseph Barrett.

Stocking & Grassland Management

Grazing of the agricultural fields included in this BEMP option will be by cattle/sheep with a target low stocking density of 0.5 LU/Ha (this stocking density will not exceed 0.7 LU/Ha without agreement). The aim is to maintain a tussocky sward. This will help improve conditions for ground nesting birds such as Meadow Pipit and Skylark. Supplementary feeding of stock with hay in the winter can take place, but feeding areas (e.g. ring feeders) will be moved around the fields regularly to prevent poaching of the ground. Supplementary feed can provide seeds and feeding opportunities for wintering passerines.

iv. Rush management. Rushes within the agricultural fields will not be allowed to grow to the extent that they rush tussocks collapse and form mats that can smother the ground vegetation. Rotational cutting, i.e. cutting every other year should be sufficient to maintain these levels. Rush cutting in the fields and rough grassland areas should aim to maintain rush levels at 30-70% cover. Approved herbicide application (direct application – licking) will be permitted to combat persistent high levels of rush cover.

   a) All rush cuttings will be removed from the treated fields. Topping will be delayed until after mid-July to minimise the risk to ground-nesting birds. In fields with a heavy soft-rush infestation (>60% cover) a second cut, four to eight weeks after the initial topping, will help to reduce rush cover in the following year. Reducing and maintaining rush cover at below 50% cover in areas initially with 60% and more cover will be a target.
   b) It may be impractical to cut rushes in the wetter or rockier fields, so these may be left if they form a small proportion of the field area, or they can be controlled by cattle trampling during aftermath grazing.

Hedgerow Planting/Hedgerow management/Fencing

The existing hedgerow network within this land holding is fairly extensive (>11km) but is of variable quality. There is also considerable opportunity for hedgerow planting and management on these lands. Existing hedgerows will be subject to supplementary (bolstering) planting to improve their structure and biodiversity value. New hedgerows will be planted according to the advice in Appendix

A of this report and as indicatively illustrated in Figure 6.2. Up to 4.8km of new hedgerow will be established as shown in Figure 6.2. In addition, existing hedgerows will be protected by stock-proof fencing. Stock-proof fencing/electric fencing will be erected a minimum of 3m from the base of the established hedgerows. Stock-proof fencing will also be erected to exclude livestock from accessing the watercourse that runs through the northern part of the land holding. All fencing will be renewed and maintained as required during the lifetime of the wind farm.

Existing hedgerows are to be managed to provide hedges with thick (minimum 2m wide) bases. Hedges will be cut to provide an A-shape, wider at the base with the aim to create hedges that are a minimum of 2m wide at the base and 2.5m high. All hedgerow cutting is to take place in the period 1st September to 28th February, i.e. outside the bird breeding season. Any existing areas of scrub found within the grassland fields are to be retained. Trimming of the scrub can be undertaken to prevent encroachment into the surrounding areas. Hedgerow management advice from the All-Ireland Pollinator Plan to be followed (see Appendix A).

6.2 Erection of Bird and Bat Nest Boxes & Bat Roost

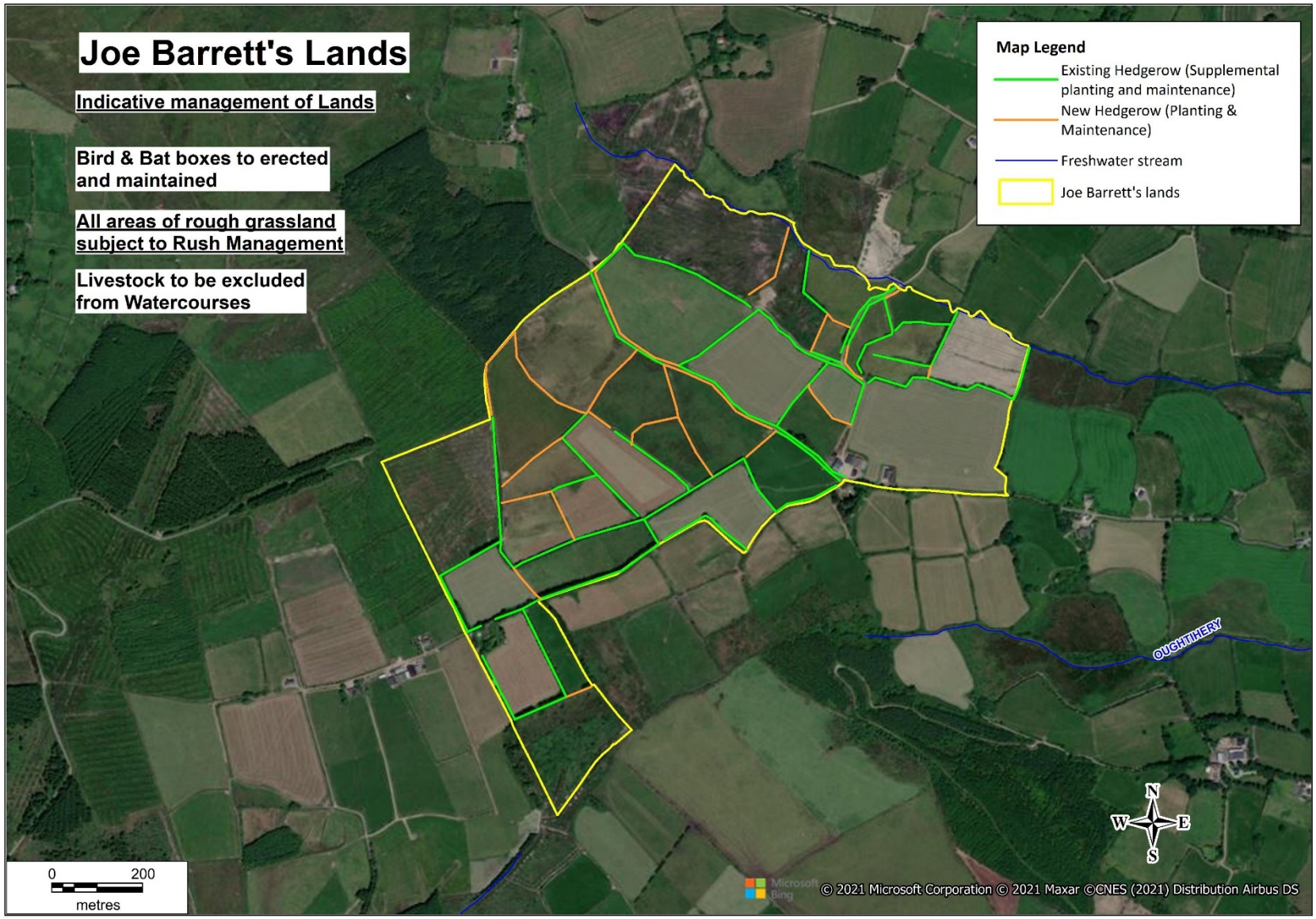
Under this option an external Barn Owl nest box will be erected at an agreed location either on a tree or on a pole specifically installed for this purpose. If a suitable additional site is available on farm buildings a second Barn Owl box will be erected within the land holding. A bat roost box will be installed within a suitable farm building within the landholding.

A minimum of 15 recycled plastic/woodcrete bird nest boxes will be erected at locations selected by the project ecologist. The type and specification of the boxes will be chosen to be appropriate to the habitats present. These boxes will be inspected and maintained regularly throughout the project.

A minimum of 8 recycled plastic/woodcrete bat roost boxes will be erected and maintained at sites selected by the project ecologist. These will be inspected annually by a licensed bat specialist. In addition, two Lesser Horseshoe Bat Night Roost structures (see Appendix C) will be installed at selected and agreed locations within the landholding.

Figure 6.1 Barrett's lands

Figure 6.2 Summary of indicative BEMP commitments for Barrett's lands.



7 Coillte Wildlife Corridors

It is proposed to strategically clear c. 18ha of Coillte lands to provide enhanced ecological connectivity between large areas of open upland habitats (see Figure 1). As is shown in Figures 7.1-7.3 below this will open corridors between areas of upland habitat.

Proposed Restoration/Management Actions

The following agreed actions will be subject to discussion and agreement with both BAU Estates Team and the Certification & Environment Team to actions and methodologies employed will reflect those employed by Coillte under forest certification guidelines. However, the proposed approach as part of the BEMP commitments is as follows:

1. Fell and extract existing conifer crop with tracked machinery in Year 1.
2. Mulch any remaining brash using a low ground-pressure excavator in Year 1.
3. Block furrow drains in Year 1, inserting peat dams at intervals of 10 metres. Dams may be spaced further apart in flatter areas.
4. During year 3 check to see if any natural regeneration of conifers is occurring in the area and manually clear any regeneration of exotics if present.

During Year 6 check to see if any natural regeneration of conifers is occurring in the area and manually clear any regeneration of exotics if present.

As part of the ongoing monitoring of the BEMP passive monitoring of the use by mammals and birds of these corridors will be monitored using long-term deployment of wildlife trail cameras over the course of the first 5-year action plan phase of the BEMP. In addition, the use of the corridors by commuting and foraging bats will be monitored using passive detectors during the first 5-year action plan. Key results will be posted on the BEMP website.

The current aerial mapping view of each of the corridors is shown in Figure 7.1-7.3 below.

Figure 7.1 Coillte wildlife corridor to west of the proposed wind farm site (0.99ha).

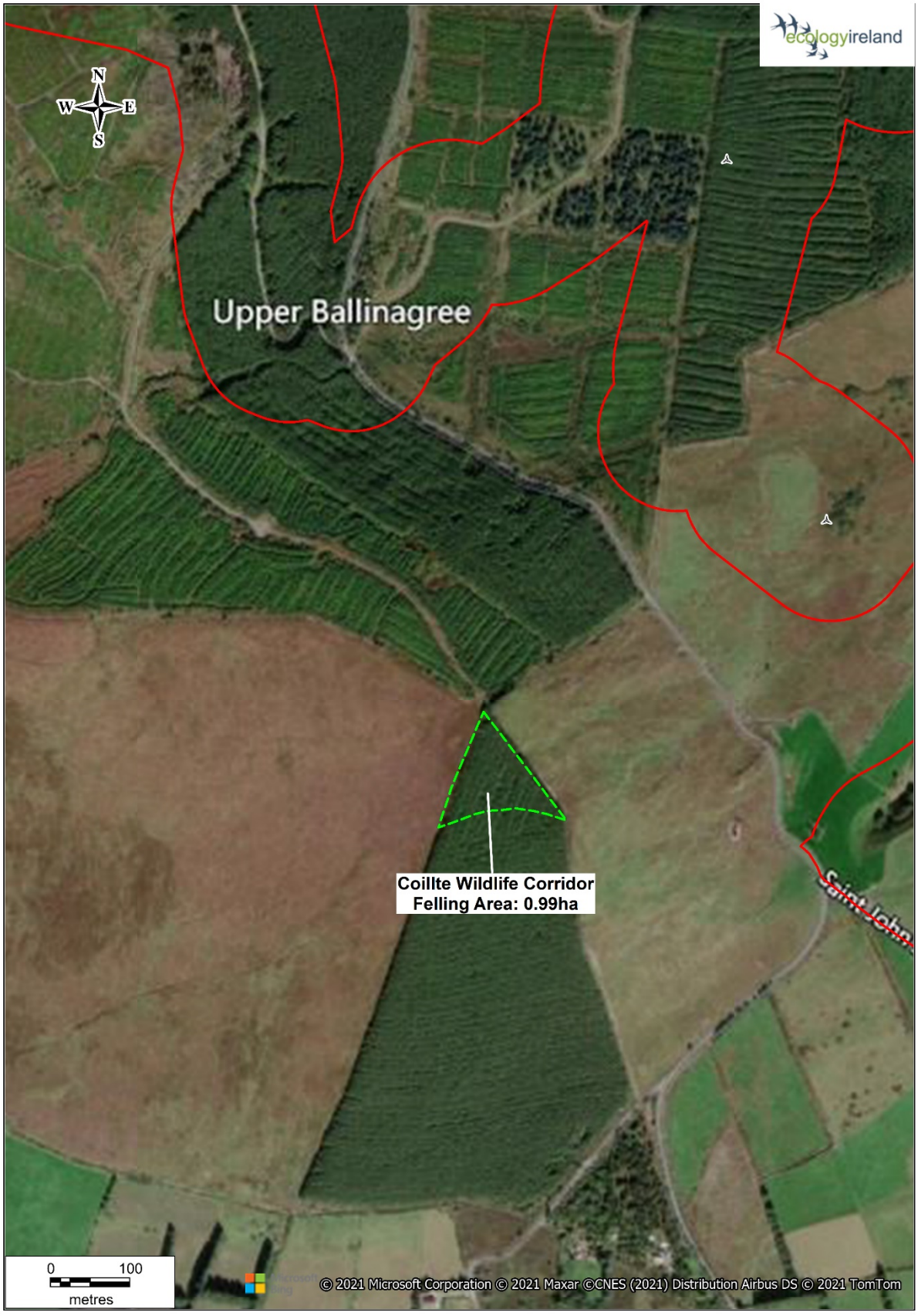


Figure 7.2 Coillte wildlife corridor to northwest of the proposed wind farm site (10.38ha).

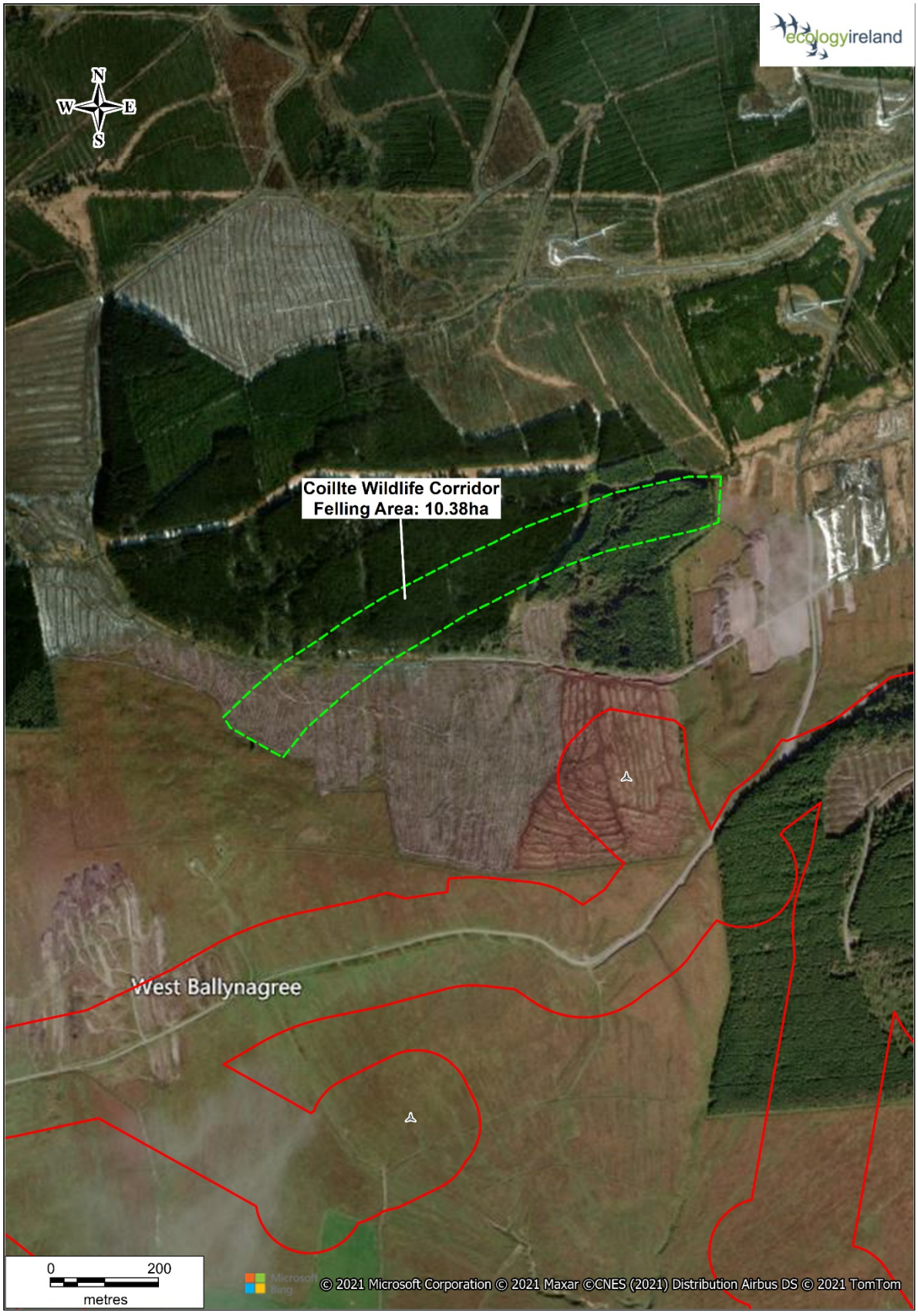
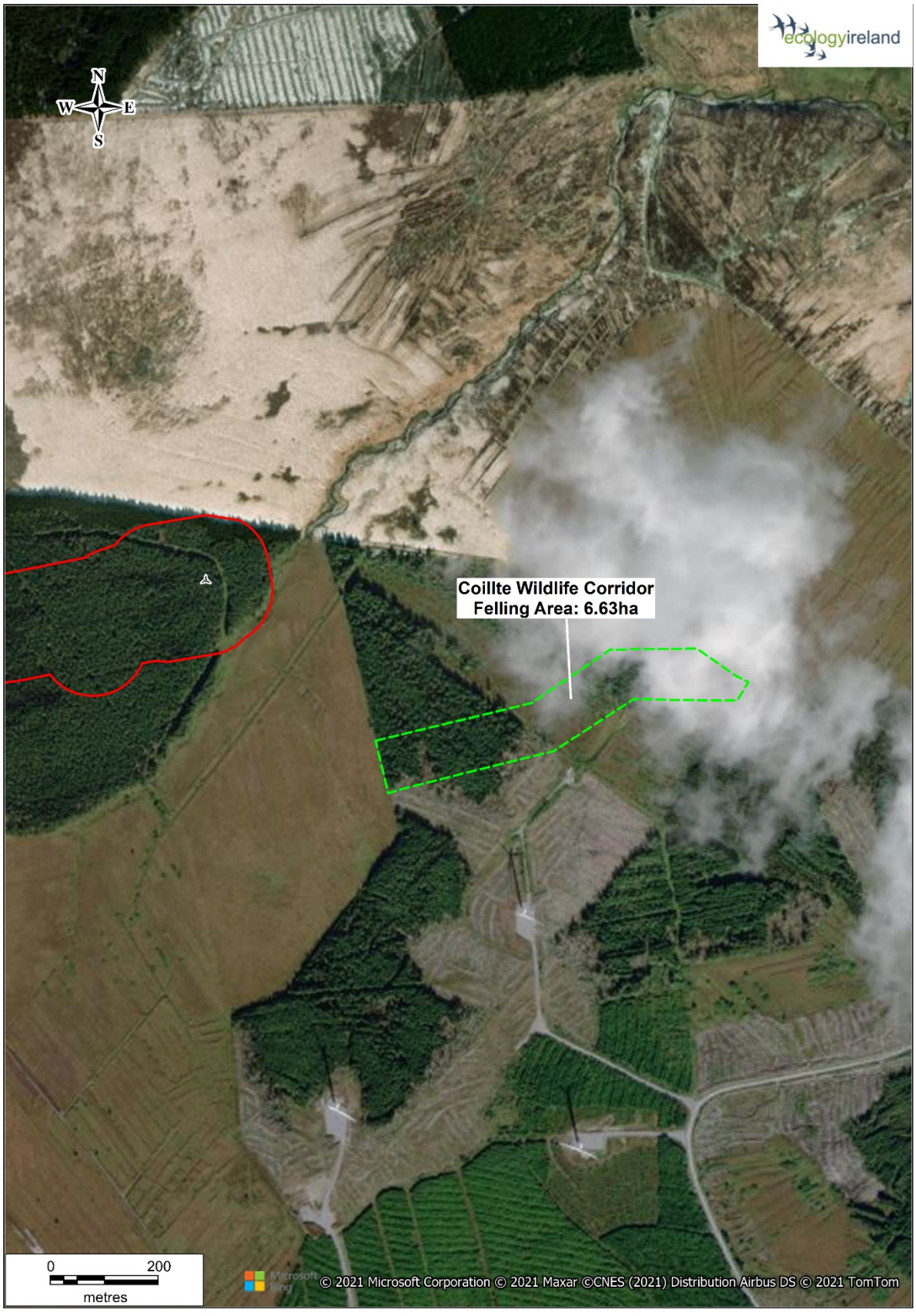


Figure 7.3 Coillte wildlife corridor to northeast of the proposed wind farm site (6.63ha).



Appendix A

Hedgerow Establishment & Management

(Credit: Bride Project; All-Ireland Pollinator Plan)

Bride Project website: https://www.thebrideproject.ie/ (accessed 22nd November 2021)
All-Ireland Pollinator Plan website: https://pollinators.ie/ (accessed 22nd November 2021.

8.

HEDGEROWS (B, C, WQ)

OVERVIEW

The majority of Ireland's hedgerows date from the eighteenth and nineteenth century, but some hedgerows have been dated to prehistoric times. Hedgerows have been used to define field, farm, parish and even county boundaries and they are a very ancient and important part of our heritage. They were also used as livestock enclosures and thus needed to be stockproof. This is why many of our hedgerows contain thorn species such as Hawthorn (Whitethorn), Blackthorn, Holly, Dog Rose, Bramble and Gorse (Furze). The electric fence has now replaced these and is being used to reinforce stockproof hedging on many farms. The BRIDE Project hedgerow mix introduces several other native and less widely used species such as Guelder Rose, Spindle, Hazel, Buckthorn, Alder Buckthorn and Bird Cherry to enhance the biodiversity value of this new approach to hedgerow creation. This measure is designed to reinstate some of our lost hedgerows along with creating a new habitat for insects, birds and bats. **Retain - not remove!**

Guelder Rose, one of the hedgerow species included in the BRIDE Hedgerow Mix

TIMEFRAME

Any time between October and March.

Location

Hedgerows can be planted in the centre of a large field or alongside a livestock or machinery passageway. The quality of existing hedgerows can be improved by filling gaps with some of the hedgerow species.

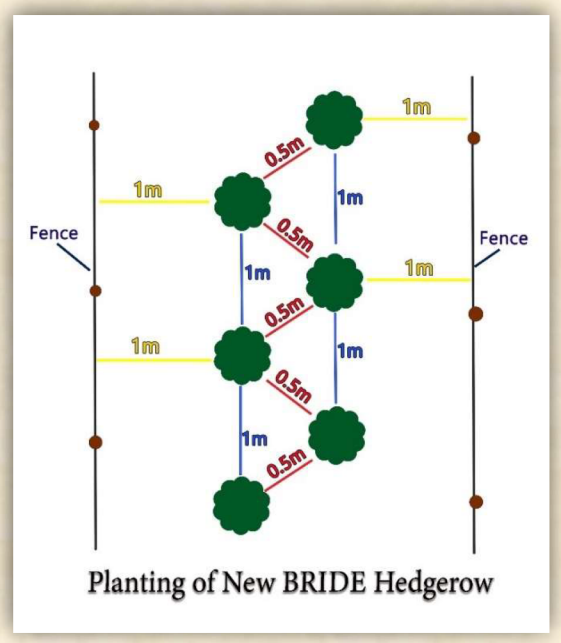
Benefits

Hedgerows create shelter from rain and sun for livestock as well as a very important habitat for a wide range of plant and animal species. Hedgerows provide corridors for wildlife that enable them to connect with other habitats. A mature hedgerow will visually enhance the farm you work on and also the countryside you live in. It can also prevent run-off from farmland thus preventing flooding, soil erosion and pollution. Hedgerows also significantly lower your carbon footprint.

Habitat Creation - Grassland Farmer

New hedgerows should ideally be located alongside a farm passageway or can be used to replace an existing wire fence boundary. If planting beside a farm passageway, ensure it is set back far enough from the passageway (2m) such that it does not interfere with livestock, electric fences or machinery. Plant on the northern side of an east-west running passageway to allow the sun dry out the passageway and thus help to prevent potholes. Plant on either side or both sides of a north-south running passageway.

Have the ground as bare as possible before planting a new hedgerow. The plants should be spaced at 3 per metre in a staggered line using the BRIDE Project hedgerow mix (up to 15 species – use at least 8 species). The mix contains many different species as the focus is on improving biodiversity rather than making the hedgerow stockproof. The traditional hedgerow contained mainly Whitethorn (Hawthorn) and Blackthorn but with the advent of electric fencing the need for thorn shrub species is no longer as important as it was in the past. Planting a native tree every 50m will add to the structure and biodiversity value of the hedgerow. Adding too many trees will cause shade as the trees mature in later years and possibly out compete the hedgerow species. When choosing plants, it is important to use plants with a good root structure that are tall and strong enough to require minimum maintenance. Small 'whips' will mean more work keeping the area free from competing grasses and bramble. Ensure the hedgerow is protected from livestock using an electric fence 1m out from the new hedgerow.



Planting of New BRIDE Hedgerow

This fence will need to be moved out further as the hedge grows and expands.

BRIDE Hedgerow Plant Mix	
Species	**Latin Name**
Crab Apple	*Malus sylvestris*
Blackthorn	*Prunus spinosa*
Alder Buckthorn	*Frangula alnus*
Purging Buckthorn	*Rhamnus catharticus*
Bird Cherry	*Prunus padus*
Wild Cherry	*Prunus avium*
Dogwood	*Cornus sanguinea*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Holly	*Ilex aquifolium*
Wild Privet	*Ligustrum vulgare*
Guelder Rose	*Viburnum opulus*
Spindle	*Euonymous europaeus*
Goat Willow	*Salix caprea*
Grey Willow	*Salix cinerea*

Habitat Creation - Tillage Farmer

This option may not suit tillage farmers as the requirement for larger fields and machinery was the reason many hedgerows were removed in recent decades. However, planting a new hedgerow in some of the bigger fields will greatly add to the biodiversity and carbon reduction of tillage farms as well as creating corridors of connectivity for wildlife. Large fields are prone to soil erosion, weather exposure and run-off. Creating new hedgerows will minimise soil erosion and siltation of streams and rivers and greatly enhance the landscape value of your farm. Livestock access will not be an issue for tillage farmers but avoiding spray drift and fertiliser onto the habitat is important.

Habitat Management – Existing Hedgerows

All BRIDE Project hedgerows should be allowed to grow and mature so that their full biodiversity and carbon sequestration value can be achieved. They should be side-trimmed only, to prevent encroachment and this will need to be carried out every year or at least every 2 years. The practice of "leaving a whitethorn here and there" defeats the purpose of the exercise and makes the job more difficult for the hedge cutting contractor. Do not use pesticide, fertiliser and slurry anywhere near the habitat.

Side Trimmed Hedgerow

Habitat Management – New Hedgerows

If rabbits or hares are a problem, guards will need to be used and will be an additional cost where this is an issue. Over the first and possibly second year, vegetation will need to be kept down to ensure the new plants are not out-competed. Trampling around the plants in the first year of establishment will prevent undergrowth build-up. The first year can also be problematic for the plant if drought conditions occur. The new hedgerow may need watering if this is the case. Wind rock can be an issue before the plant gets properly rooted so ensure the plant is upright and straight at all times. Pruning after planting is not required as the mix contains many plant species, several of which will not tolerate pruning.

Rabbit / Hare guards may be needed in certain areas

Habitat Management - Roadside Hedgerows

Roadside hedges can be maintained in a similar way to hedgerows in a field. However, in an area of poor visibility, the hedge will need to be flailed to a height where visibility of oncoming traffic or pedestrians is not compromised e.g. at a junction, bad bend, under power or telephone lines, at a field entrance, dwelling house or farm entrance - where good sightlines are important. Roadside hedgerows need to be side trimmed every year (this can take place throughout the year, in the interest of safety) to prevent encroachment onto the road, thereby reducing the risk of damage and injury to vehicles and road users respectively.

Poor quality hedgerow with low height structure, gaps and low density

Hedgerow Management advice:

Cutting to encourage flowering

- Leave at least one mature Whitethorn/ Blackthorn tree within each hedgerow.
- Where possible, cut hedgerows on a minimum 3-year cycle. Cutting annually stops the hedgerow flowering and fruiting.
- Where possible, cut in rotation rather than all at once as this will ensure some areas of hedgerow on your farm will always flower (Blackthorn is white in March. Whitethorn flowers at silage time in May).
- Hedges managed for pollinators should ideally be cut between Nov-Jan. If they must be cut outside this, cut in rotation, so some areas remain undisturbed.
- Let some Bramble and Ivy grow in hedgerows. They are key nectar and pollen sources in summer and autumn.
- Where hedgerows must be cut along the roadside for safety, allow the inside to flower.
- Aim for a hedgerow that is as high as possible, but at least 2.5m above ground level or above the bank.
- Let some of your hedgerows grow wild, side-trimming only.

Hedgerow base

- Avoid spraying the hedgerow base, use mechanical weed control and spot spray only in exceptional cases
- Leave an unfertilised buffer margin at the hedgerow base

A pollinator-friendly hedgerow should be flowering, at least 2.5m in height, and should be trimmed in an A-shape.

Willow is a very important food source in early spring when queens emerge from hibernation. Having Grey/Goat Willow, Whitethorn, Whitebeam, Crab apple or Wild Cherry as individual mature trees around the farm will provide important food for pollinators.

Autumn

Appendix B

Establishment and Management of Wild Bird Cover

(After joint presentation by Teagasc, BirdWatch Ireland and Bat Conservation Ireland)

(https://www.teagasc.ie/media/website/environment/biodiversity-countryside/Wild-Bird-Cover.pdf)

Supplementary advice on establishment of wildbird cover strips

(from Hen Harrier Project; http://www.henharrierproject.ie/HHPActions.pdf)

Wild Bird Cover 1

Why? This unharvested crop is a giant bird table for seed eating birds and tillage flora and fauna

Seed eating birds

- in decline due to :
  - Intensification
  - Specialisation
  - Loss of tillage in many counties

Seed eating birds

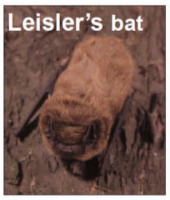
- need a variety of seeds:
  - Large cereal seeds - Yellowhammer
  - Small linseed or kale seeds - Linnet

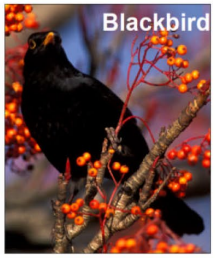
Flowers in Wild Bird Cover

- Attract pollinators and insects

Birds and Bats

- Feed on insects and worms





Wild Bird Cover crops

- provide cover for small mammals

Birds of prey

- feed on small mammals

BAT CONSERVATION IRELAND

BirdWatch Ireland

teagasc
AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

Wild Bird Cover 2

Oats & Linseed sown each year *Recommended*

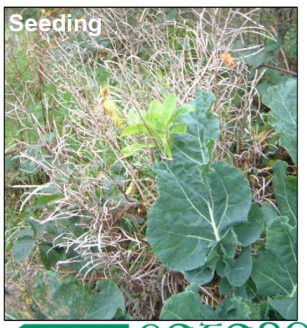
- Grow in all soil types (including heavy, acid)
- Tolerates a low pH

Oats and Linseed sown together

Kale

- Needs a high pH- lime important
- Fertiliser may be essential for establishment
- Club root risk (resistant varieties available)
- Biennial
  - Vegetative in year 1
  - Flowers and seeds in year 2
  - Remains in situ for 2 years
  - Sow every 2nd year
  - Establish half the plot in kale and other half cereal

Year	Half Plot	Half Plot
1	Kale Yr 1	Cereal
2	Kale Yr 2	Cereal
3	Cereal	Kale Yr 1
4	Cereal	Kale Yr 2
5	Kale Yr 1	Cereal



Bat Conservation Ireland

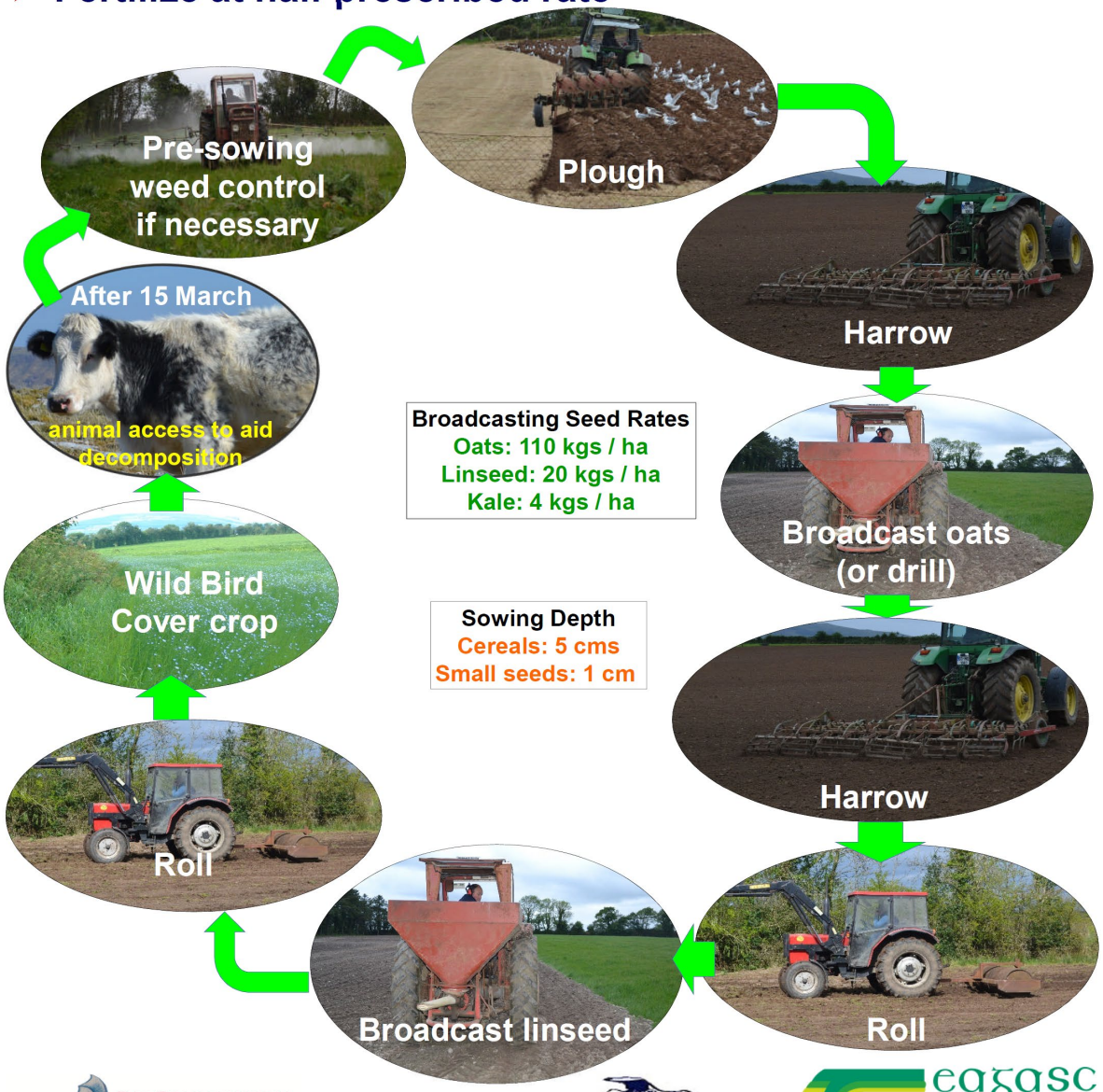
BirdWatch Ireland

teagasc
Agriculture and Food Development Authority

Wild Bird Cover 3

Sowing & Management

- Fine, firm seedbed essential
- Any cultivation method allowed provided successful crop establishment
- Pre-sowing weed control may be necessary
- Plough, harrow and roll as necessary
- Drill or broadcast - if drilling, reduce seed rate
- Fertilize at half prescribed rate



Bat Conservation Ireland

BirdWatch Ireland

Teagasc
Agriculture and Food Development Authority

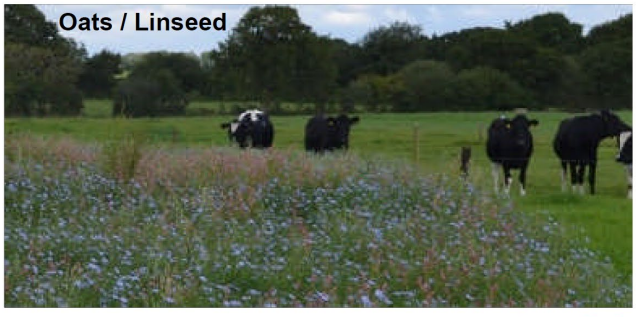
Wild Bird Cover 4

GLAS Requirements

- Sow by 31 May
  - each year for cereals,
  - every second year for kale
- Do not apply pesticides after sowing
- Spot treat noxious weeds and invasive species

- Fence
  - stock proof
  - fit for purpose

- Do not harvest
- Leave in situ until 15 March the following year (2 seasons for kale)
- Before replanting, livestock may enter from 15 March to aid decomposition of trash



Bat Conservation Ireland

BirdWatch Ireland

teagasc
Agriculture and Food Development Authority

The Hen Harrier Project has prepared a number of recommended actions for biodiversity on farmland. They recommend a wild bird seed cover strip alongside an existing hedge or treeline:

Wild Bird Cover

The crop is sown as a strip 9 m wide, running parallel to an existing hedge. The crop should be sown on the sheltered side of the hedge, ideally on the southern or eastern side. If livestock are present the crop must be protected by a stockproof fence. An uncultivated grass strip at least 1 m wide must be retained between the hedge and the seed crop. The crop must contain a cereal crop (preferably Triticale) and Linseed. Other seeds such as Buckwheat, Gold of Pleasure, Mustard, Fodder Radish, Forage/ Oil Seed Rape and Vetch may also be included in the seed mix. The sowing rate is 7.5 Kg of Triticale/ 100 m strip and 1.5 Kgs of Linseed. Other seeds should be in much smaller quantities. Triticale is the recommended cereal crop; it has considerable advantages over Oats as it is better suited to acidic soils and poor ground conditions. It also has stronger straw which will delay lodging. The chaff on the seed triticale makes it less attractive to birds and rodents ensuring that seed consumption is delayed until other food sources are depleted, this will ensure that a significant feed resource is retained into the mid-winter period.

- prepare the site as early as ground conditions permit. Burn

off the existing sward with a suitable herbicide to prevent competition with perennial grasses. it is important to avoid drift into the adjacent hedge or uncultivated grass strips.

- sites for wild bird cover should be power harrowed rather than ploughed. This reduces post cultivation soil carbon loss.
- the crop must be sown by May 31st each year, where a spring sown crop has failed it is permitted to establish an Autumn sown crop with suitable winter cereals 10 Kgs/ 100 m strip or 0.5 Kgs/ 100m of Forage Rape. Availing of this option wil prevent the use of the site for wild bird cover in the following year.
- the action must be delivered in an 11 m wide strip along a field boundary (9m crop with a 1 m grass strip between the crop and the hedge and a further 1 m grass strip between the crop and the fence). The minimum length of a strip is 80m. This action can be delivered at multiple locations on the farm.
- the wild bird cover does not have to remain in the same place for the duration of the project. It can be established in different locations each year.
- the crop must remain in situ until the March 15th the following year. Livestock may enter the parcel from March 15th to planting time, to aid in the decomposition of the trash.
- linseed/ cereal mix 1.5 kg Linseed for a 100m strip plus 7.5 kg of Triticale/ ha for 100 m
- pesticides cannot be applied post sowing.

- Annual weeds particularly weeds of cultivation are a positive feature of wild bird cover strips.
- one bag of granulated lime and 0.5 bags of 10:10:20 should be spread on each 100 m strip at the time of sowing
- all seeds can be scattered by hand, but it is important that they are rolled into the seed bed immediately after sowing.

When you have finished growing wild bird cover on a site, let grasses and herbs regenerate naturally from the seed bank in the soil.

Appendix C

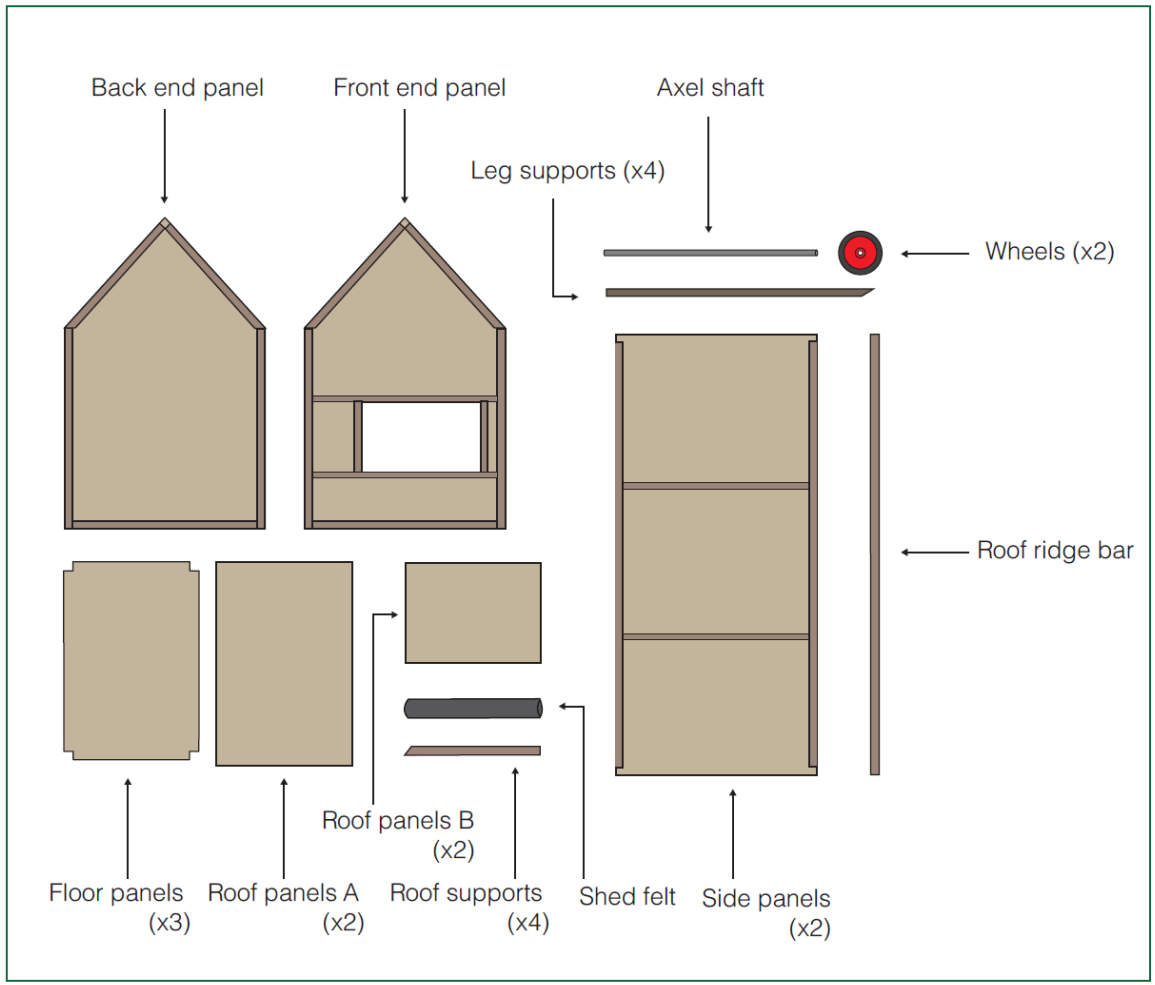
Design of Lesser Horseshoe Bat (Night Roost)

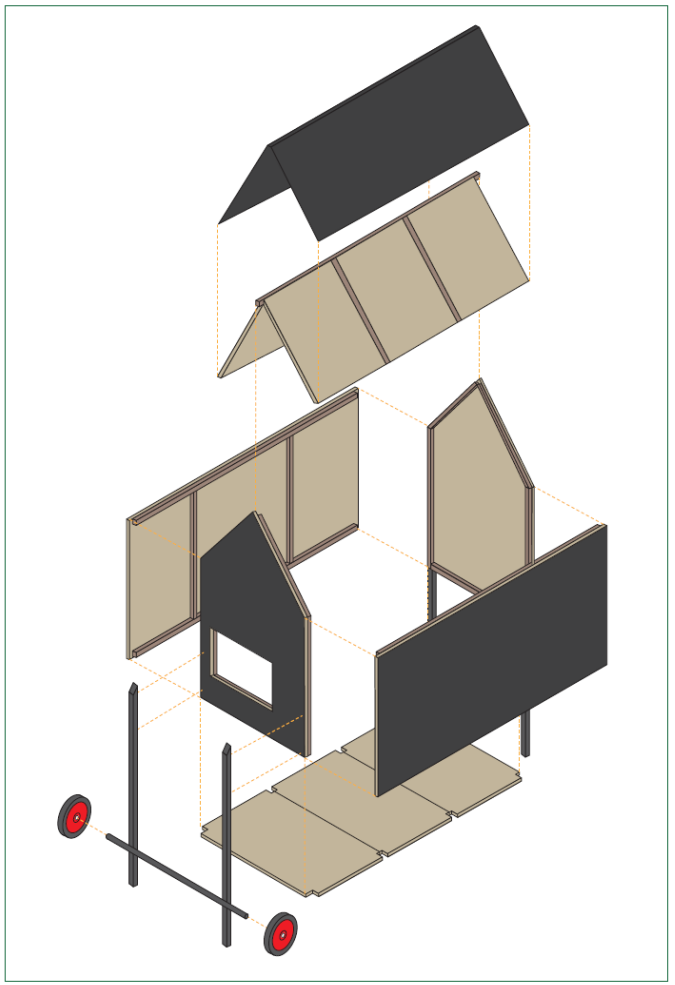
(Credit: Vincent Wildlife Trust)

Vincent Wildlife Trust website: https://www.vincentwildlife.ie/ (accessed November 22nd 2021).

Cathedine Night Roost Design

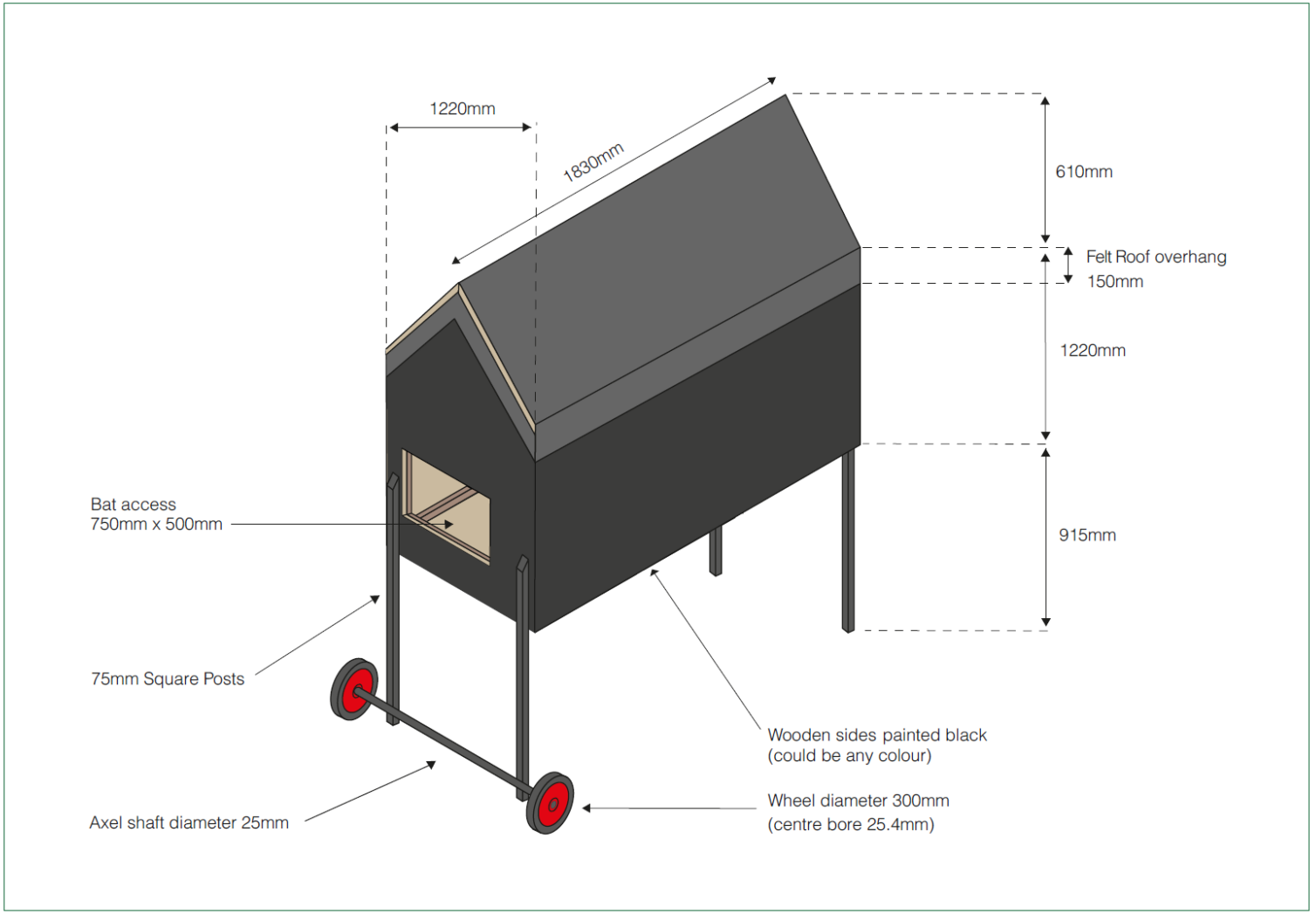
The Vincent Wildlife Trust





Cathedine Night Roost Design

The Vincent Wildlife Trust



Appendix D

Establishment & Management of Woodland patches (Credit: Bride Project)

Bride Project website: https://www.thebrideproject.ie/ (accessed 22nd November 2021)

23.

WOODLAND (B, C, WQ)

OVERVIEW:

Native woodland (woodland that is dominated by trees that are native to Ireland) once covered most of Ireland but once the first farmers came to inhabit the island over 5000 years ago, the countryside has slowly changed to a landscape dominated by agriculture. The gradual dominance of agriculture has left the island with a very low percentage of woodland cover (one of the lowest in the EU).

TIMEFRAME

Trees can be planted anytime from October through to March

LOCATION

Locating an area to plant woodland needs to be considered carefully as the wood will change dramatically as the trees begin to mature. Furthermore, woodland has traditionally been planted on the poorest land area of the farm and if this area is not suitable for grass or cereals it may not be suitable for trees. Keep in mind the long-term view of this undertaking and ensure that it will not interfere with any future building or other development plans. Most areas of the farm should be suitable for planting but consider the potential loss of a cherished view (in years to come). Know the soil type of your farm so that the most suitable species can be planted. Ensure no overhead powerlines are present. Existing farmland habitats should be avoided.

BENEFITS

Trees provide enormous environmental benefits such as food and shelter for a wide range of species. Trees are also vital for their role in carbon sequestration and their ability to soak up

water and hence reduce flood risk. Native trees in particular are very valuable for biodiversity as they can support a huge range of insects, fungi, mosses, lichens, plants, birds and mammals. Mature woodland, especially native woodland, is one of the most biodiversity-rich habitats and even small areas of woodland can significantly improve the biodiversity of intensively managed farmland. Planting woodland, hedgerows or tree-lines will positively alter the visual landscape of the countryside for years to come. Removing these habitats will do the opposite and create a featureless landscape.

Rare native oak woodland near Conna, in the Bride valley

Habitat Creation

A native woodland plot involves the planting of 160 native trees on 0.1ha (min.) of the farm. The Native Woodland Establishment Scheme is more suitable to planting larger areas (over 0.1ha). These sapling trees consisting of nine species (Pedunculate or Sessile Oak, Scots Pine, Downy Birch, Wild Cherry, Hawthorn, Hazel, Spindle, Crab Apple, Buckthorn or Alder Buckthorn) in a fenced plot to prevent livestock access. The larger (Oak and Scots Pine) and medium-sized species (Wild Cherry and Downy Birch) are planted in the central area of the plot while the smaller species are planted on the outer perimeter but some of the more shade tolerant species (Hawthorn, Spindle and Hazel) will be interspersed throughout the wood. Willows are extremely important for biodiversity as many insect species rely on them for pollen and as a food plant. They can easily be planted from cuttings and it is recommended that at least five be planted in each wood.

BRIDE Woodland Plant Mix	
Species	**Latin Name**
Alder	*Alnus glutinosa*
Downy Birch	*Betula pubescens*
Bird Cherry	*Prunus padus*
Wild Cherry	*Prunus avium*
Hazel	*Corylus avellana*
Holly	*Ilex aquifolium*
Pedunculate Oak	*Quercus robur*
Sessile Oak	*Quercus petraea*
Scots Pine	*Pinus sylvestris*
Rowan	*Sorbus aucuparia*
Goat Willow	*Salix caprea*
Grey Willow	*Salix cinerea*

New woodland is ideally suited to an awkward corner or an area away from the farmyard, but do not put it on an existing wildlife habitat. The new wood will not be thinned as it is designed purely for biodiversity enhancement and should be planted as a legacy with future generations in mind. It is said that "an oak tree grows for 300 years, rests for 300 years and declines gracefully for the next 300 years". Leave a winding path through larger woodland plots so that the farmer and future generations can appreciate the wood as it grows and matures. Open spaces within a wood provide important habitats for wildflowers and grasses and will help to increase the biodiversity value of the wood. Native tree species (see BRIDE Project tree mix) suited to the farm's specific soil type and aspect will be chosen by the ecologist in consultation with the project participant.

Habitat Management

New native woodland

It is important that newly planted trees are kept free from encroaching grass and bramble especially during the first three years after planting. It is also important to ensure that protective fencing is erected to prevent livestock access. Check for rabbit or hare damage and use guards if necessary. Pruning in the first 3-5 years, if needed, will prevent forking of the tree in future years. Water (especially in the first year) if necessary.

Pruning the tree in the first 3-5 years will prevent forking later. It is only a matter of time before this tree will split.

Established Deciduous Woodland

Existing woodland should be fenced to prevent livestock access. Deer can also damage woodland and fencing may be necessary if deer are preventing natural regeneration. Invasive species such as Cherry Laurel and Rhododendron should be eradicated. This process is best achieved by cutting and chemically treating the remnant stump - treatment may need to be continued for at least three years. Non-native trees such as Beech and Sycamore support far less biodiversity than native tree species such as Oak and these non-native species can dominate large sections of woodland if they remain unchecked. Gradual replacement of non-native tree species with native trees could be considered.

Deadwood, whether fallen or standing is a very important component of native woodland ecosystems. Dead or decaying trees provide a rich habitat for fungi and a wide range of invertebrates that recycle nutrients back into the soil during the decomposition process. No need for bug hotels in a properly functioning woodland!

Appendix E

Letters of Consent

Landowner: Andrew Scannell

Address: Kilberrihert, Coachford, County Cork

Folio Number(s): CK10316F, CK28978F and CK104443F

Date: 29/11/2021

To Whom it may concern,

I confirm that I am aware of and I hereby consent to the submission of a planning application for the Ballinagree Wind DAC project which includes the proposal for my lands to be included as part of the Biodiversity Enhancement Management Plan. The proposed works are described in the plans and reports submitted alongside the planning applications.

Regards,

Andy Scannell

Landowner: Anthony Kelleher

Address: Horsemount, Ballinagree, Macroom, Cork

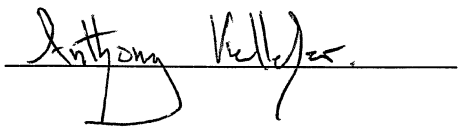
Folio Number(s): CK49759 and CK45440F

Date: 24/11/2021

To Whom it may concern,

I confirm that I am aware of and I hereby consent to the submission of a planning application for the Ballinagree Wind DAC project which includes the proposal for my lands to be included as part of the Biodiversity Enhancement Management Plan. The proposed works are described in the plans and reports submitted alongside the planning applications.

Regards,



Landowner: Joe Barrett

Address: Glounaglough, Rylane, County Cork

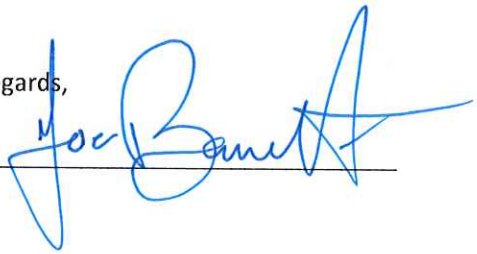
Folio Number(s): Part of Folios CK11021, CK11023 and CK3039

Date: 29/11/2021

To Whom it may concern,

I confirm that I am aware of and I hereby consent to the submission of a planning application for the Ballinagree Wind DAC project which includes the proposal for my lands to be included as part of the Biodiversity Enhancement Management Plan. The proposed works are described in the plans and reports submitted alongside the planning applications.

Regards,



Landowner: Noel Nunan

Address: Cahernaboul, Macroom, County Cork

Folio Number(s): CK7131

Date: 29/11/2021

To Whom it may concern,

I confirm that I am aware of and I hereby consent to the submission of a planning application for the Ballinagree Wind DAC project which includes the proposal for my lands to be included as part of the Biodiversity Enhancement Management Plan. The proposed works are described in the plans and reports submitted alongside the planning applications.

Regards,

Noel Nunan