



Carrigeen Renewable Energy  
Development

Bird Survey Report

2022 Breeding Season

Doherty Environmental Consultants Ltd.

March 2026

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

This report has been prepared by Doherty Environmental Consultants (DEC) Ltd with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for Carraigin Power Ltd. and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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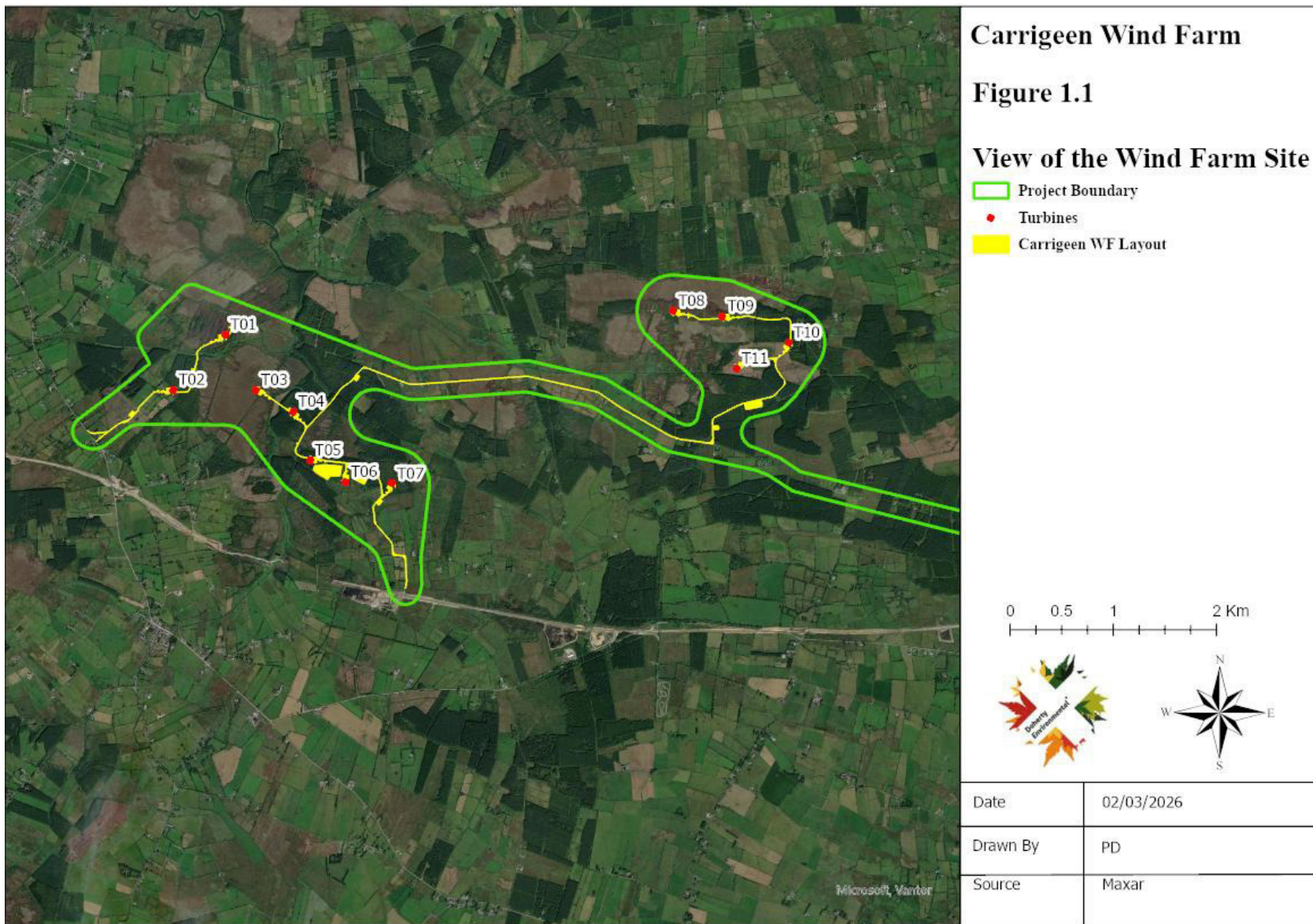
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## **1.0 INTRODUCTION**

Doherty Environmental Consultants (DEC) Ltd have been contracted to carry out ornithological surveys on behalf of Carragain Power Ltd. for the proposed Carrigeen Renewable Energy Development, Co. Roscommon, which consists of a Wind Farm Site, a Grid Connection, and Turbine Delivery Route (altogether the Project). An aerial view of the Wind Farm Site is shown on Figure 1.1.

Surveys commenced at the Wind Farm Site in late March 2022. This report provides details of the surveys completed during the 2022 breeding season (late-March 2022 to September 2022). The 2022 breeding season represents the first round of breeding season ornithological surveys completed for the proposed Project.

The surveys have been undertaken in order to provide a baseline environmental data set, which will be incorporated into the Environmental Impact Assessment (EIA) for the project as required under EU EIA Directive (Council Directive 2011/92/EU, amended in 2014/52/EU).



## 2.0 METHODOLOGY

### 2.1 VANTAGE POINT SURVEYS

The primary objective of the bird surveys completed for the proposed Project is to:

- Establish the presence and behaviour of raptors, waterbirds and other bird species known to be sensitive to collision with wind turbines over the Wind Farm Site;
- Obtain data on the movements of target species which would facilitate an analysis of foraging activity and collision risk;
- Identify any flight paths used by non-breeding waterfowl.

The bird surveys involved vantage point surveys of the buildable area. The methodology adopted for the 2022 breeding season vantage point surveys was derived from the Scottish Natural Heritage<sup>1</sup> (SNH) *Recommended bird survey methods to inform impact assessment of onshore wind farms* (2017). SNH guidance for surveys at wind farms recommend that field surveys focus on those species of high nature conservation value for which there is potential for impacts to occur. These target species in Ireland are derived from the following sources:

- Special conservation interest (SCI) bird species of the Special Protection Areas (SPAs) that occur within the zone of influence of a project; and
- those species that are of medium (amber) and high (red) conservation concern (i.e. Red Listed species).

Where species that are included under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;

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<sup>1</sup> Now known as Nature Scot.

- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >200m; 20m to 200m; and <20m<sup>2</sup>; and
- The behaviour of the target species.

SNH guidance (SNH, 2017) outlines specific survey methodologies for onshore wind farm developments. These guidelines recommend that vantage point surveys should be completed across all calendar months when the species is present or likely to be so.

Four vantage points (**VP1** to **VP4**) were used for monitoring of the proposed Wind Farm Site and surrounding area. The location of these vantage points are shown on **Figure 2.1**.

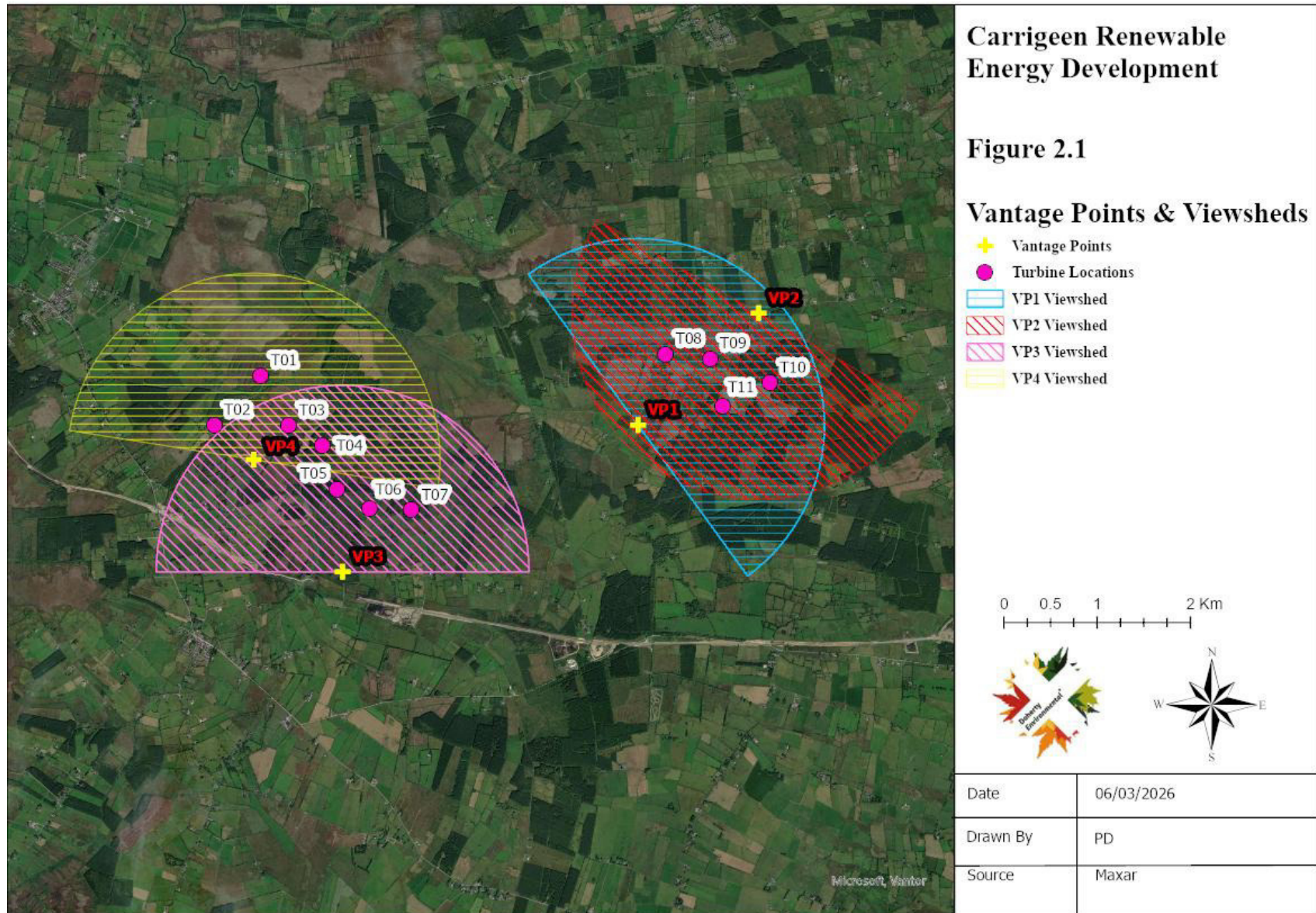
The vantage points were selected following a viewshed analysis of the proposed Wind Farm Site and a 500m buffer area surrounding the Wind Farm Site. The viewshed analysis was completed using QGIS software and is based on an observer height of 1.6m and an observable viewshed from the observer point at a height of 20m. The viewshed afforded from VP1 and VP4 is shown on **Figure 2.1**.

Surveys during the 2022 breeding season commenced in late-March 2022 and continued monthly until September 2022.

A minimum of 36 hours surveying was completed at all vantage point locations during the breeding season between late-March and September 2022. The vantage point surveys were completed by undertaking two watches of a duration of 3 hours from each point per month.

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<sup>2</sup> The flight bands are based on the minimum and maximum height (i.e. 22m and 185m respectively) of the rotor blade sweep of typical commercial wind turbines.



## 3.0 RESULTS

### 3.1 VANTAGE POINT

A total of 36 hours of vantage point watching was completed from each vantage point VP1 to VP4 during the late-March to September vantage point surveys.

A total of 8 target species were recorded during the breeding season vantage point surveys. These species (BTO Code in parenthesis) and their current conservation status are as follows:

**Buzzard (BZ):** conservation status = Green Low conservation concern

**Grey Heron (H.):** conservation status = Green Low conservation concern

**Kestrel (K.):** conservation status = Red (for Breeding Kestrel) High conservation concern

**Lesser Black-backed Gull (LB):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Mallard (MA):** conservation status = Amber (for breeding and wintering) Medium conservation concern

**Merlin (ML):** conservation status = Amber (for breeding) Medium conservation concern

**Snipe (SN):** conservation status = Red (for breeding and wintering) Medium conservation concern

**Sparrowhawk (SH):** conservation status = Green Low conservation concern.

Of the bird species recorded only Merlin is listed on Annex 1 of the EC Birds Directive.

A total of 210 flights by target species were recorded during the breeding season. **Figure 3.1** shows all flights observed during the vantage point surveys. The percentage breakdown of flights recorded per species are set out in Table 3.1 below.

**Table 3.1: Vantage Point Flight lines recorded during the 2022 Breeding Season**

Species	No. Flights	Percentage Flights
Buzzard	86	41%
Kestrel	86	41%
Grey Heron	19	9%
Mallard	11	5%
Merlin	3	1.5%
Snipe	3	1.5%
Lesser Black-backed Gull	1	0.5%
Sparrowhawk	1	0.5%

A summary of the observations for each target species is provided in the following subsections.

### **3.1.1 Buzzard**

Buzzard, along with Kestrel, was the most frequently observed species during the 2022 breeding season vantage point surveys. A total of 86 Buzzard flights were observed during the breeding season, with 41 flights being recorded in the eastern wind farm parcel and the remaining 45 being recorded in the western wind farm parcel. The number of birds recorded during individual flight observations was almost exclusively one bird with only one flight of a

pair recorded. This species was typically recorded flying within the <20m and 20 to 200m height band.

The range of activity recorded during flights included hunting, commuting, soaring, being mobbed by hooded crows; landing to perch on trees.

**Figure 3.2** shows all Buzzard flights observed during the 2022 breeding season.

### **3.1.2 Grey Heron**

A total of 19 Grey Heron flights were observed during the breeding season. All flights were observed flying within the height bands <20m and 20m to 200m. Two flights of pairs of heron were recorded with the remainder being of individual birds.

**Figure 3.3** shows the Grey Heron flight observed during the 2022 breeding season.

### **3.1.3 Kestrel**

A total of 86 Kestrel flights were observed during the breeding season, with 55 flights being recorded in the eastern wind farm parcel and the remaining 31 being recorded in the western wind farm parcel. Of these observations 76 were of an individual kestrel, whilst 9 were of pairs of Kestrel. One observation of 3 Kestrel in flight was also recorded. The majority of the Kestrel flights were observed within the <20m and 20m to 200m range.

**Figure 3.4** shows all Kestrel flights observed during the 2022 breeding season.

### **3.1.4 Lesser Black-backed Gull**

One flight of a Lesser Black-backed Gull was recorded during the 2022 breeding season. This flight was recorded within the 20 to 200m height band.

**Figure 3.5** shows the Lesser Black-backed Gull flight observed during the 2022 breeding season.

### **3.1.5 Mallard**

A total of 11 no. Mallard flights were recorded during the breeding season. The flights were predominantly recorded at low height (<20m) and of short duration.

**Figure 3.6** shows the Mallard flights observed during the 2022 breeding season.

### **3.1.6 Merlin**

Three flights of individual Merlin were observed during the breeding season. All three flights were at low height and of brief duration at less than 30 seconds.

**Figure 3.7** shows the Merlin flight observed during the 2022 breeding season.

### **3.1.7 Snipe**

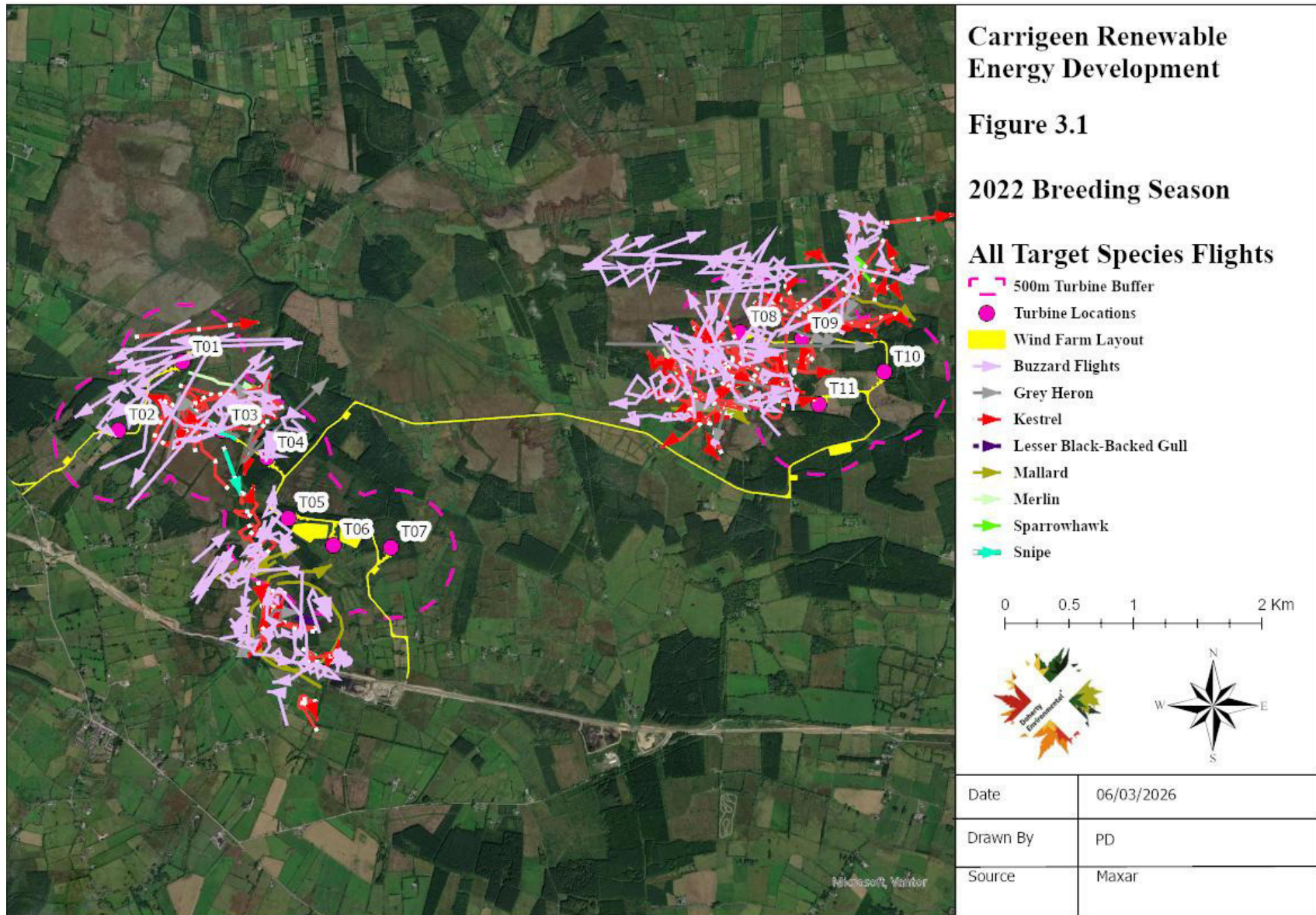
Three flights of individual Snipe were observed during the breeding season. Two of the flights were of short duration at low height over the ground at <20m. One of these flights was of a pair of snipe whilst the other was of an individual. The third flight was at higher elevation c. 100m.

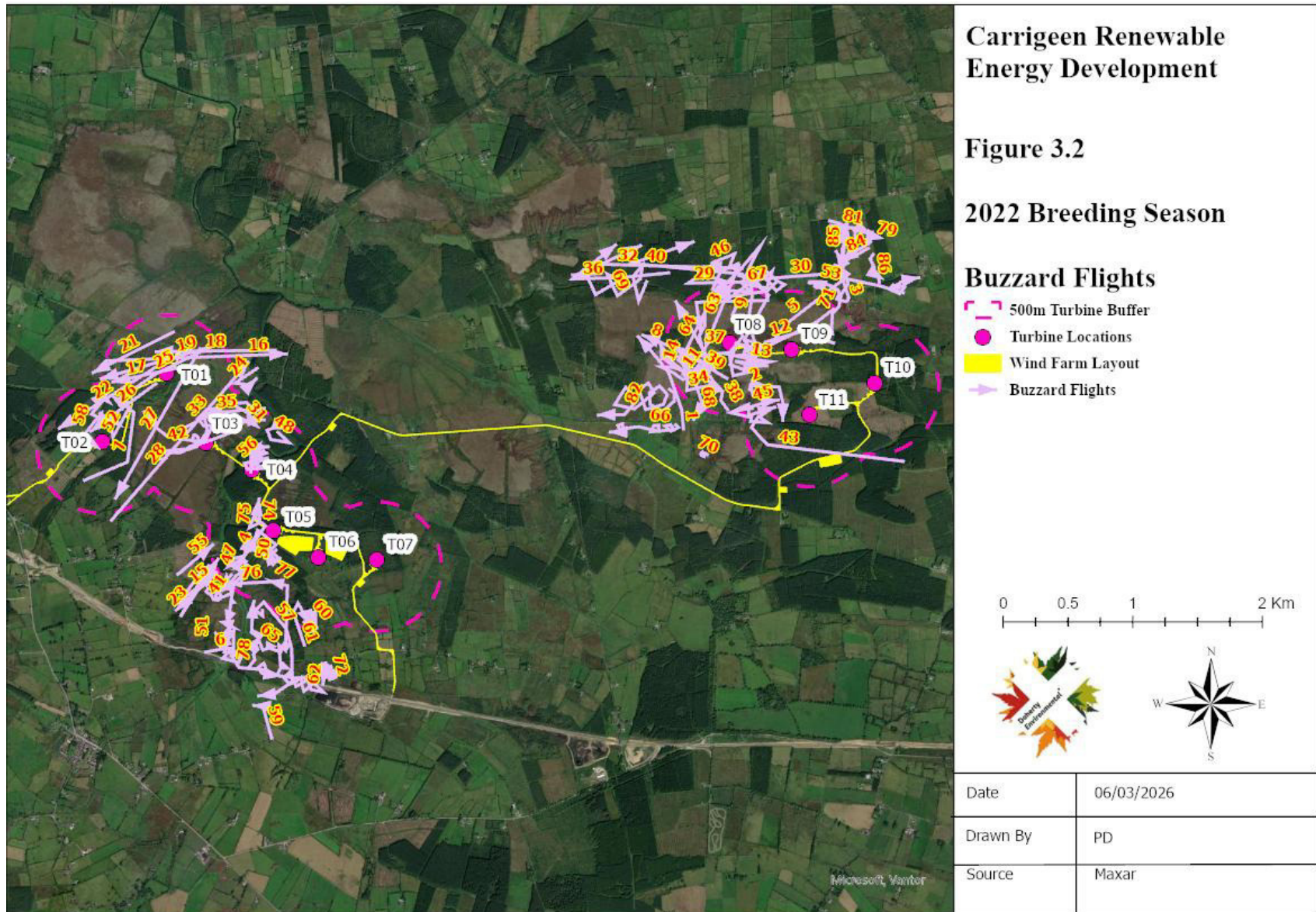
**Figure 3.8** shows the Snipe flight observed during the 2022 breeding season.

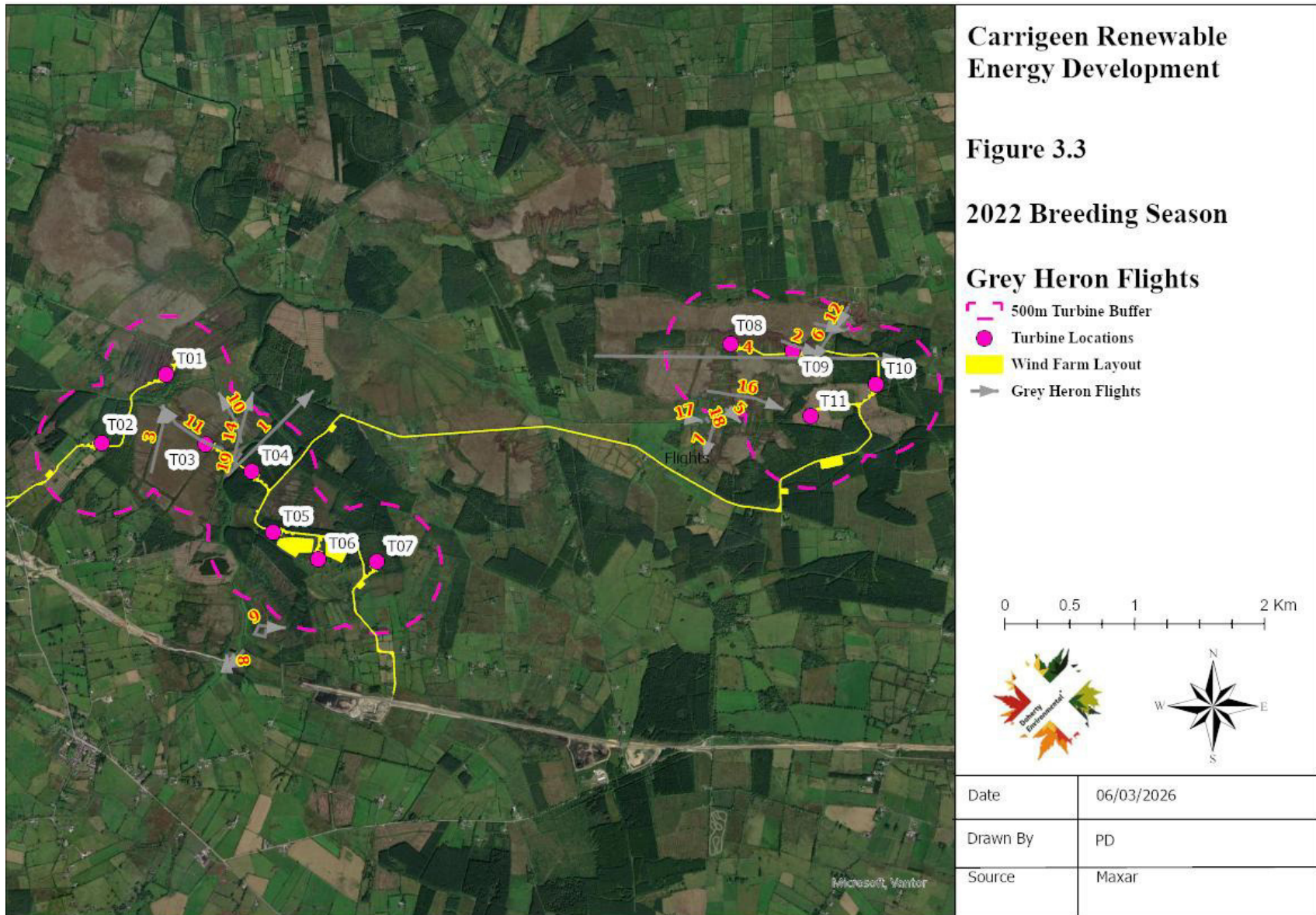
### **3.1.8 Sparrowhawk**

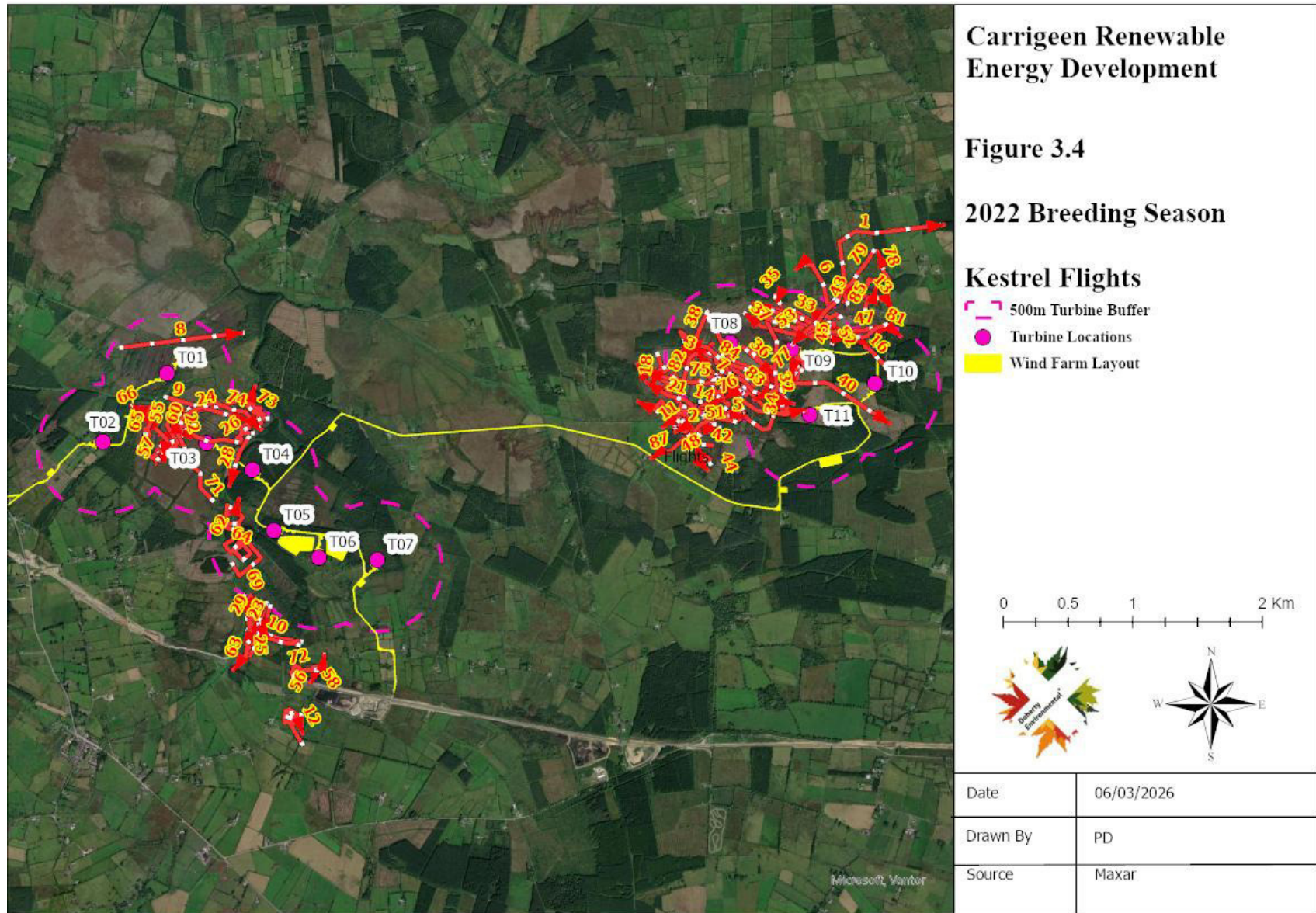
One flight of a Sparrowhawk was recorded during the 2022 breeding season. This flight was recorded low over the ground at <20m and was of short duration c. 30 seconds.

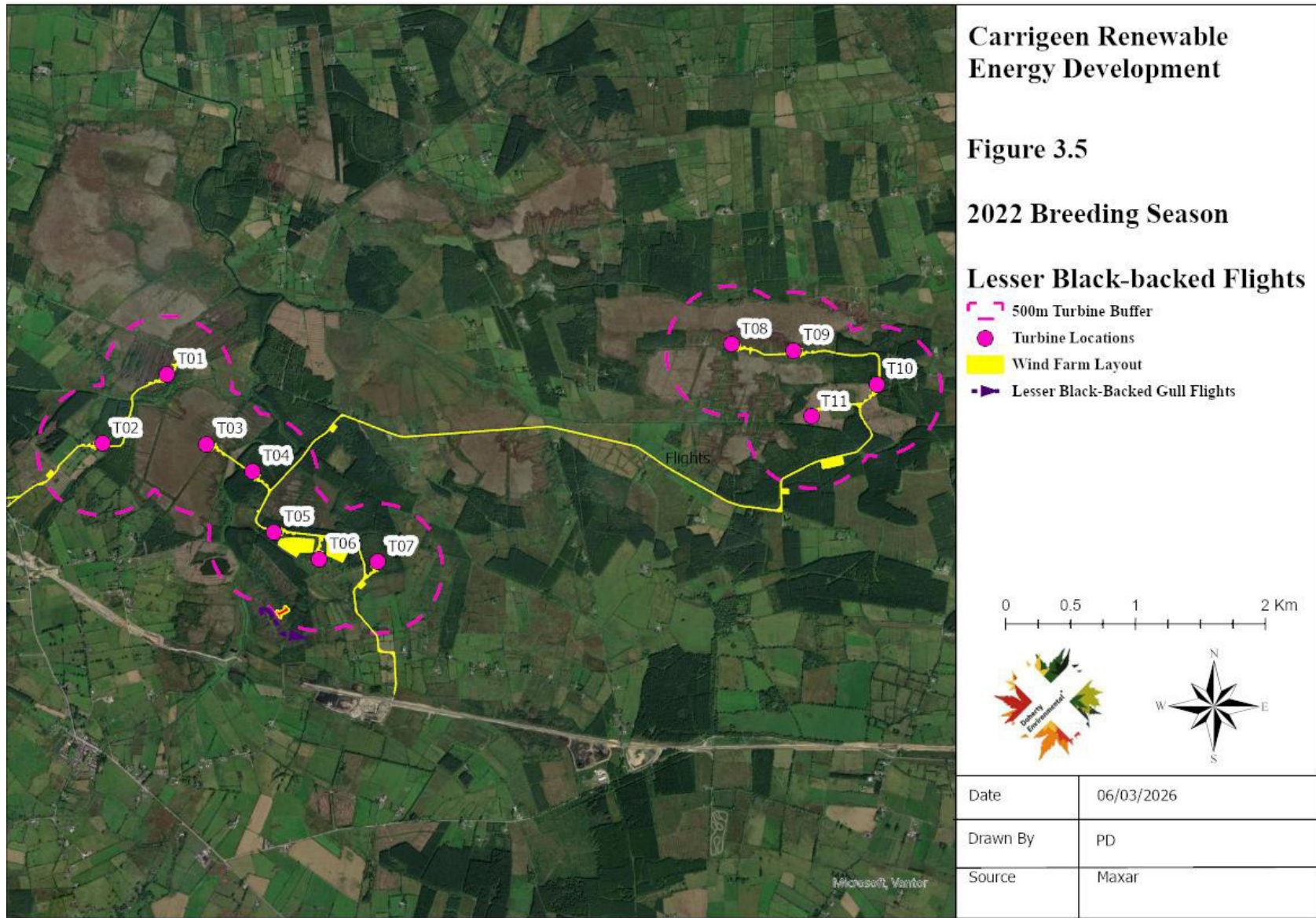
**Figure 3.9** shows the Sparrowhawk flights observed during the 2022 breeding season.

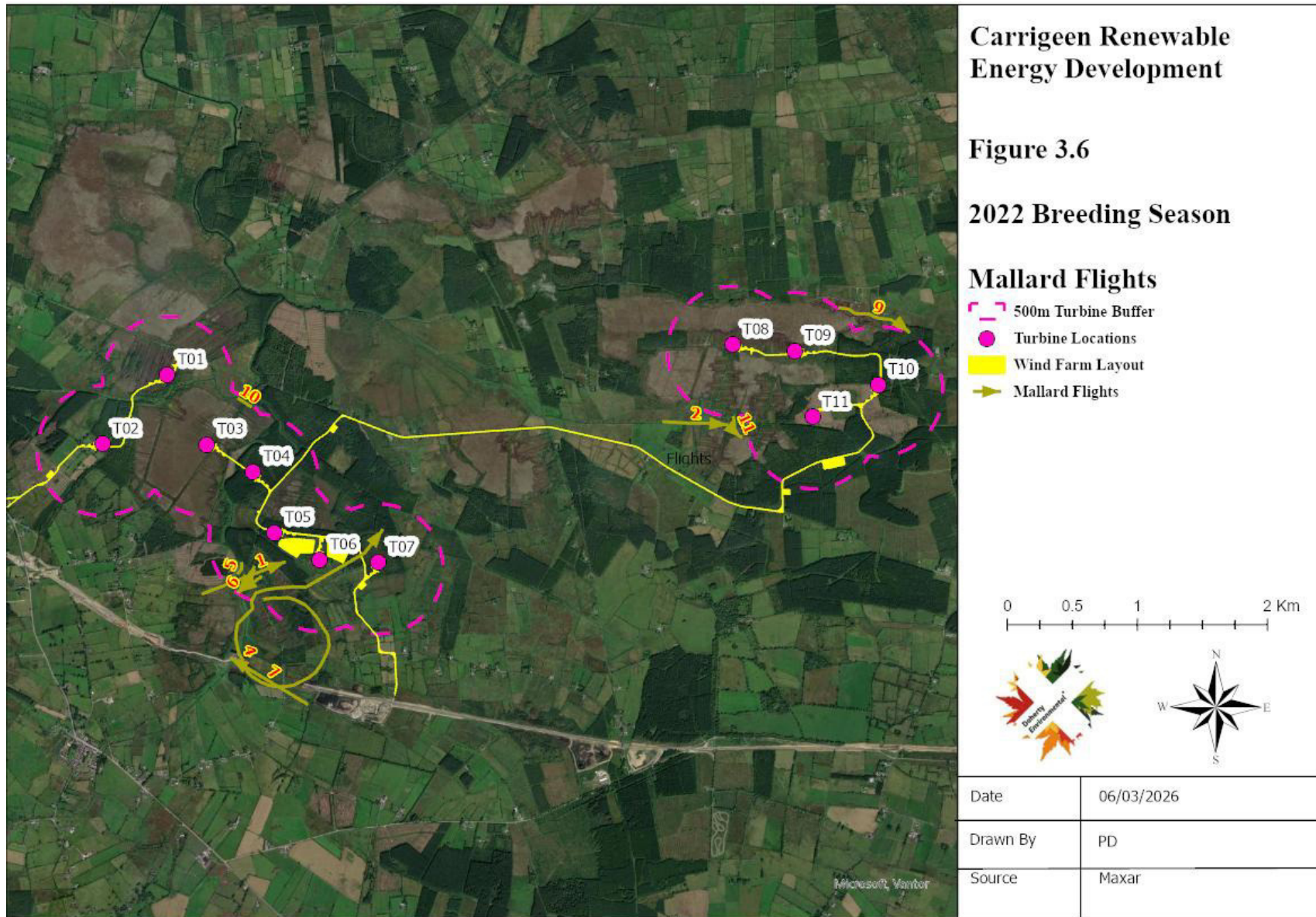


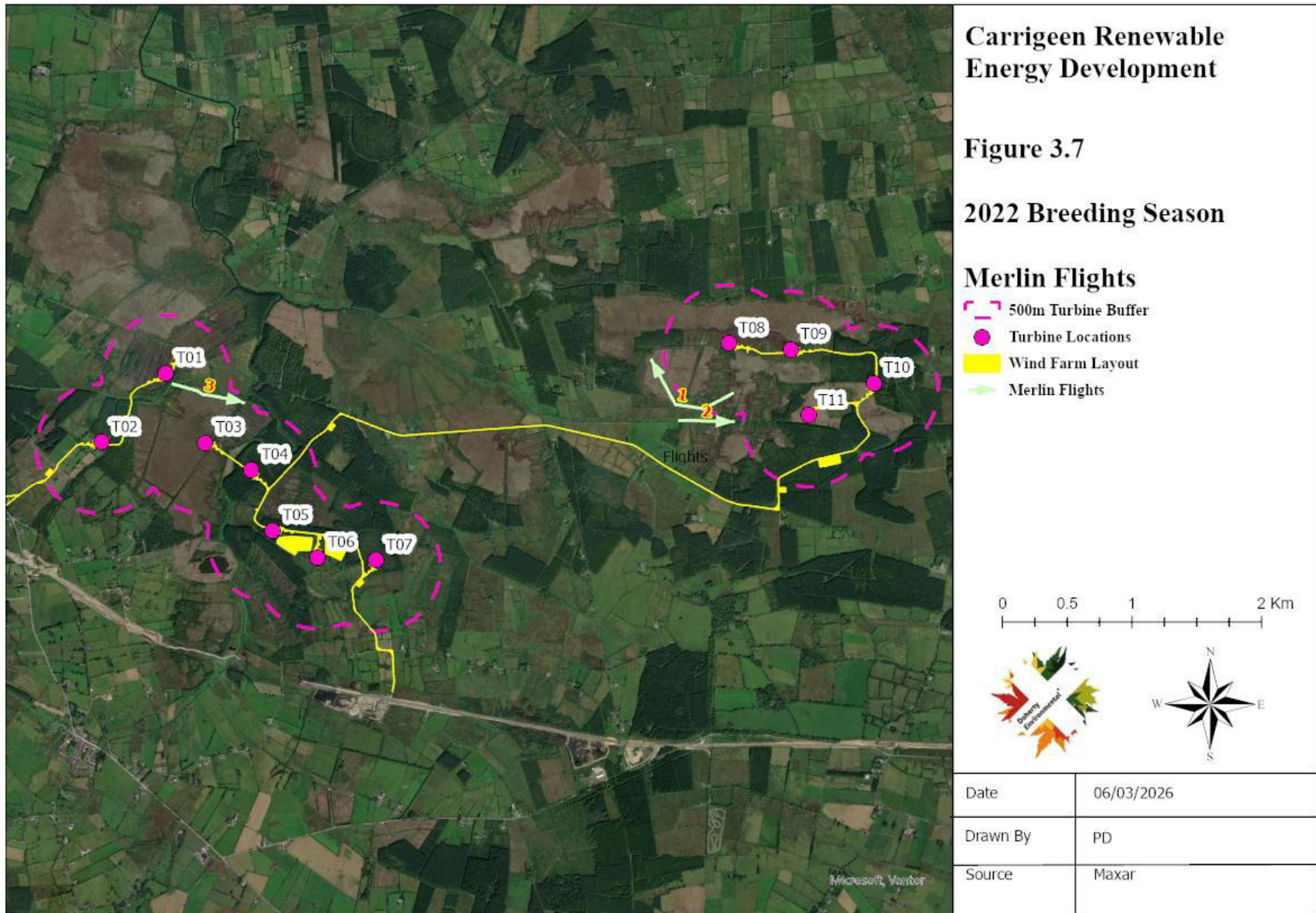


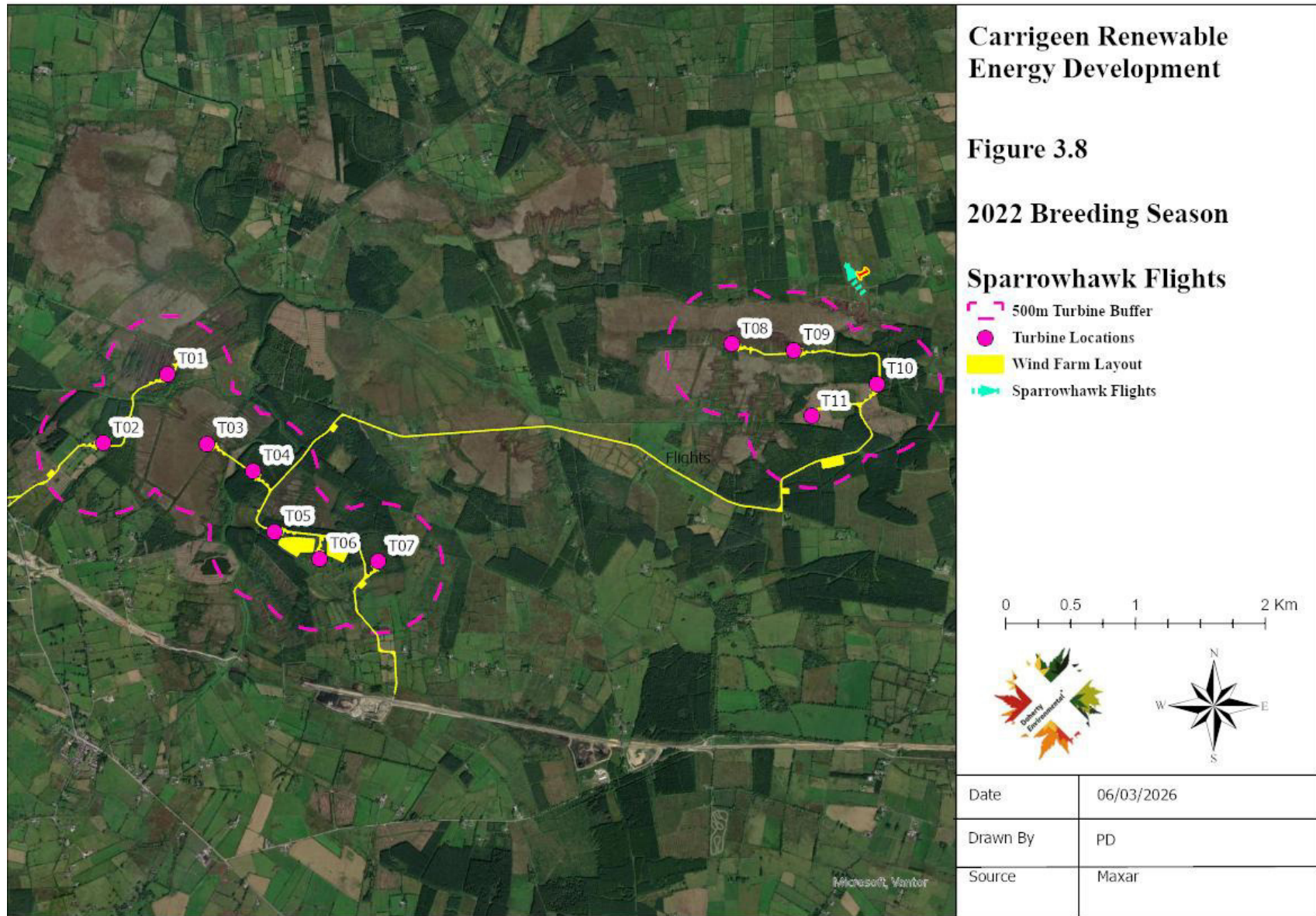


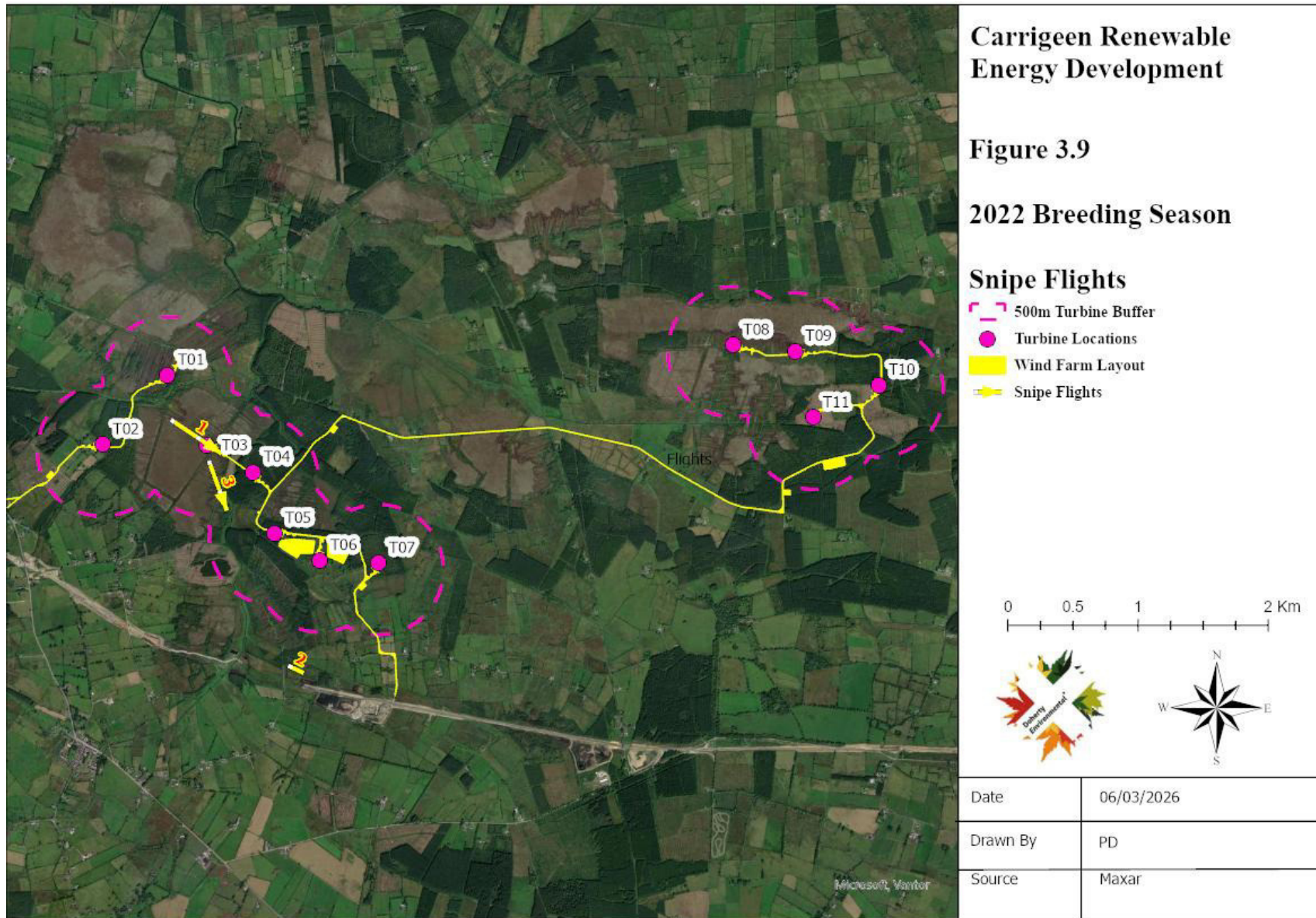












## **4.0 CONCLUSION**

During the 2022 breeding season surveys vantage point were completed for the Project.

During the vantage point surveys a total of 210 flightlines were recorded comprising 8 no. target species. The activity recorded during the vantage point surveys was dominated by Buzzard and Kestrel both of which accounted for >80% of all flight activity recorded. Low levels of flight activity for Heron, Mallard, Merlin, Lesser Black-backed Gull, Snipe and Sparrowhawk were recorded.

A total of 2 red-listed species of high conservation concern (Kestrel & Snipe) and 2 amber-listed species of amber conservation concern (Lesser Black-backed Gull; Merlin) were recorded.

Merlin was the only bird species that is listed on Annex 1 of the EC Birds Directive recorded during the vantage point surveys.



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2022-2023 Non-Breeding Season

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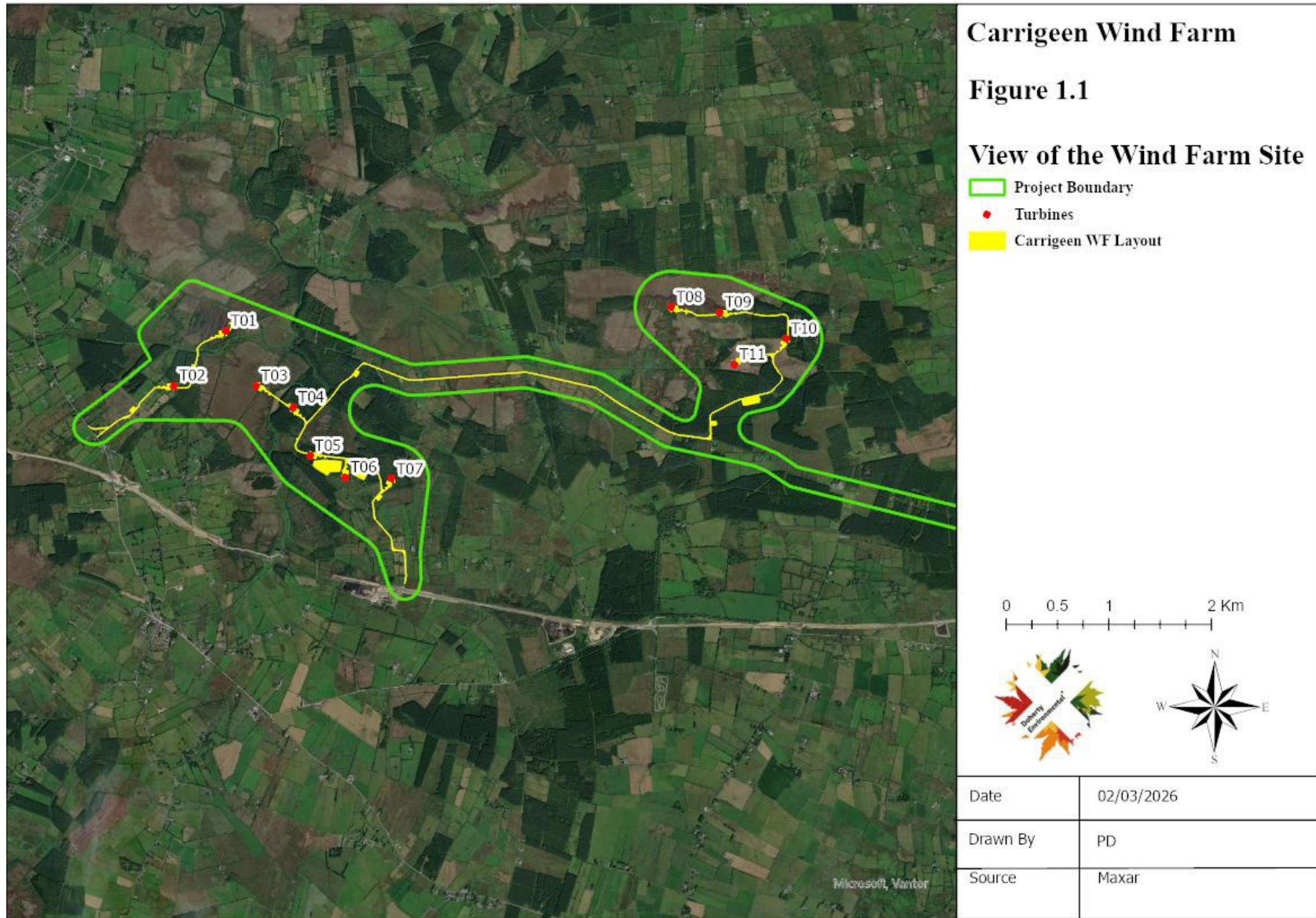
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Where species that are included under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;

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- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >200m; 20m to 200m; and <20m<sup>2</sup>; and
- The behaviour of the target species.

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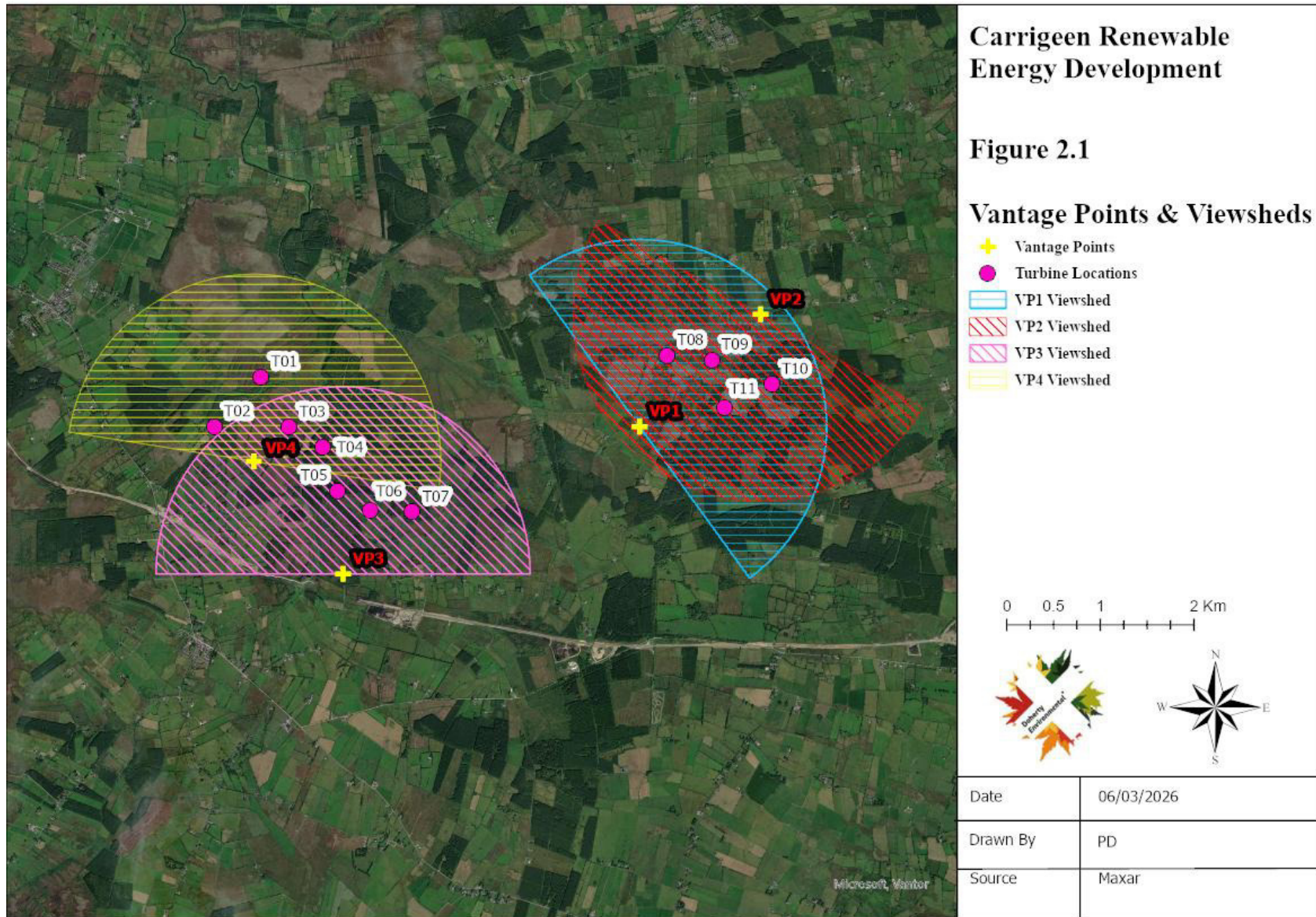
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A minimum of 36 hours surveying was completed at all vantage point locations during the non-breeding season between October 2022 and March 2023. The vantage point surveys were completed by undertaking two watches of a duration of 3 hours from each point per month.

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## 3.0 RESULTS

### 3.1 VANTAGE POINT

A total of 36 hours of vantage point watching was completed from each vantage point VP1 to VP4 during the October to March vantage point surveys.

A total of 8 target species were recorded during the breeding season vantage point surveys. These species (BTO Code in parenthesis) and their current conservation status are as follows:

**Buzzard (BZ):** conservation status = Green Low conservation concern

**Cormorant (CA):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Grey Heron (H.):** conservation status = Green Low conservation concern

**Hen Harrier (HH):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Kestrel (K.):** conservation status = Red (for Breeding Kestrel) High conservation concern

**Mallard (MA):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Snipe (SN):** conservation status = Red (for breeding and wintering) Medium conservation concern

**Sparrowhawk (SH):** conservation status = Green Low conservation concern.

Of the bird species recorded only Hen Harrier is listed on Annex 1 of the EC Birds Directive.

A total of 75 flights by target species were recorded during the 2022-2023 non-breeding season. **Figure 3.1** shows all flights observed during the vantage point surveys. The percentage breakdown of flights recorded per species are set out in Table 3.1 below.

**Table 3.1: Vantage Point Flight lines recorded during the 2022-2023 Non-Breeding Season**

Species	No. Flights	Percentage Flights
Buzzard	29	39%
Cormorant	1	1%
Grey Heron	4	5%
Hen Harrier	2	3%
Kestrel	20	27%
Mallard	10	13%
Sparrowhawk	3	4%
Snipe	6	8%

A summary of the observations for each target species is provided in the following subsections.

### **3.1.1 Buzzard**

Buzzard, along with Kestrel, was the most frequently observed species during the 2022/2023 non-breeding season vantage point surveys. A total of 29 Buzzard flights were observed during the non-breeding season. The number of birds recorded during individual flight observations was almost exclusively one bird with only one flight of a pair; and one flight of 3 birds being recorded. This species was typically recorded flying within the <20m and 20 to 200m height band, with a lower number of flights being recorded at higher elevation >200m.

The range of activity recorded during flights included hunting, commuting, soaring, being mobbed by hooded crows; landing to perch on trees.

**Figure 3.2** shows all Buzzard flights observed during the 2022-2023 non-breeding season.

### **3.1.2 Cormorant**

One brief Cormorant flight was observed from VP4 during the non-breeding season. The bird was seen flying at low height for less than 20 seconds.

**Figure 3.3** shows all Cormorant flights observed during the 2022-2023 non-breeding season.

### **3.1.3 Grey Heron**

A total of 4 Grey Heron flights were observed during the non-breeding season. All flights were observed flying low at <20m. Three of the flights observed were of pairs of heron whilst one flight comprising 4 no. birds was recorded.

**Figure 3.4** shows the Grey Heron flights observed during the 2022-2023 non-breeding season.

### **3.1.4 Hen Harrier**

Two no. Hen Harrier flights were observed during the non-breeding season, comprising one male during November 2022 and one ringtail during December 2022. Both flights were presentative of foraging bouts at a low altitude at <20m. They were observed briefly for c. 45 seconds and 30 seconds respectively.

**Figure 3.5** shows the Hen Harrier flights observed during the 2022-2023 non-breeding season.

### **3.1.5 Kestrel**

A total of 20 Kestrel flights were observed during the non-breeding season. All observations bar one were of an individual kestrel, with one observation of a pair of Kestrel being recorded. The majority of the Kestrel flights were observed within the <20m and 20m to 200m range with a low number being recorded at height, above 200m.

**Figure 3.6** shows all Kestrel flights observed during the 2022-2023 non-breeding season.

### **3.1.6 Mallard**

A total of 10 no. Mallard flights were recorded during the non-breeding season. All flights were recorded at low height at <20m and within the lower range (i.e. less than 50m) of the 20m to 200m band. All flights were of a short duration, at less than 45 seconds.

**Figure 3.7** shows the Mallard flight observed during the 2022-2023 non-breeding season.

### **3.1.7 Sparrowhawk**

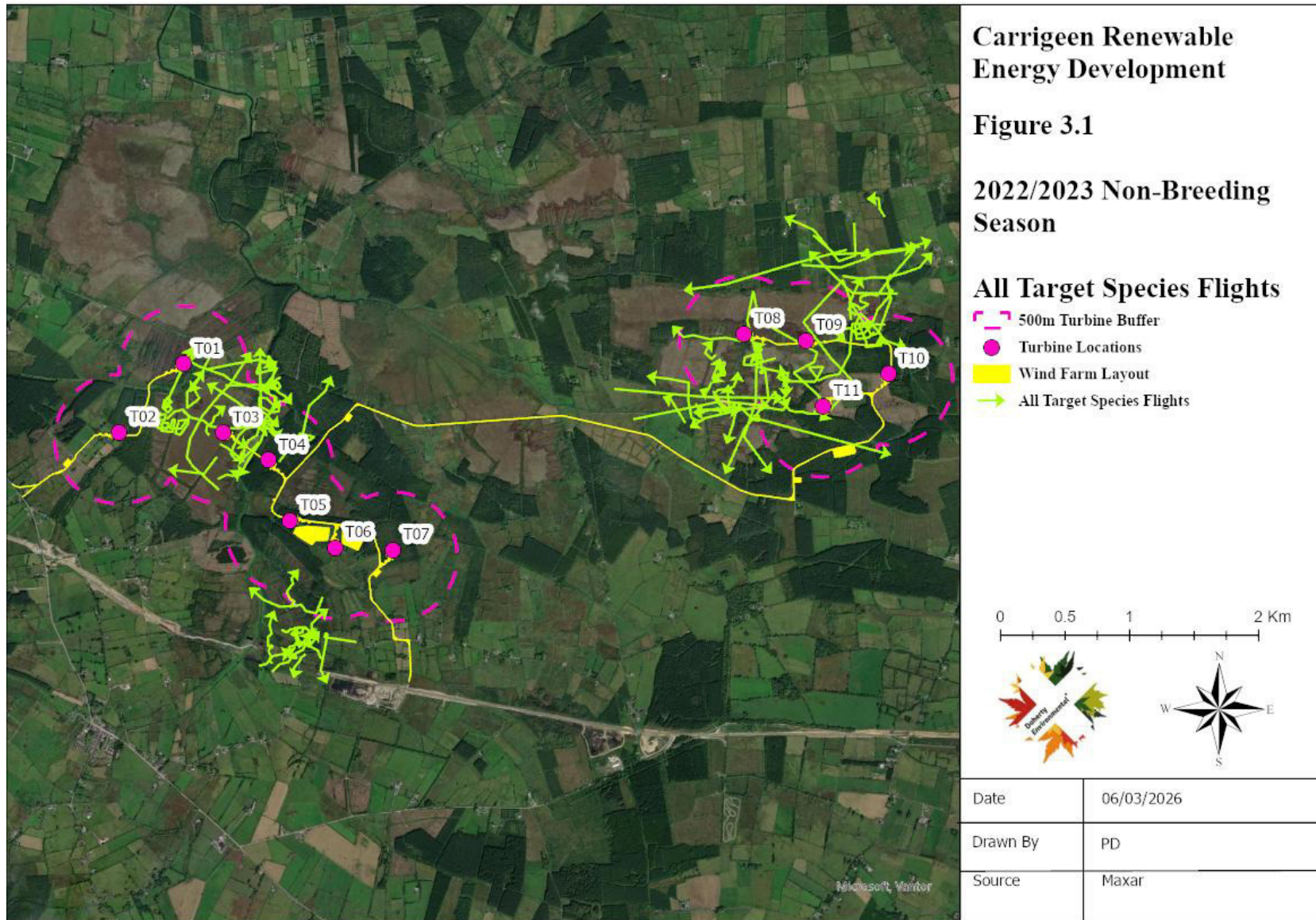
Three flights of a Sparrowhawk were recorded during the 2022/2023 non-breeding season. These flights were recorded low over the ground at <20m and were of short duration at less than c. 30 seconds.

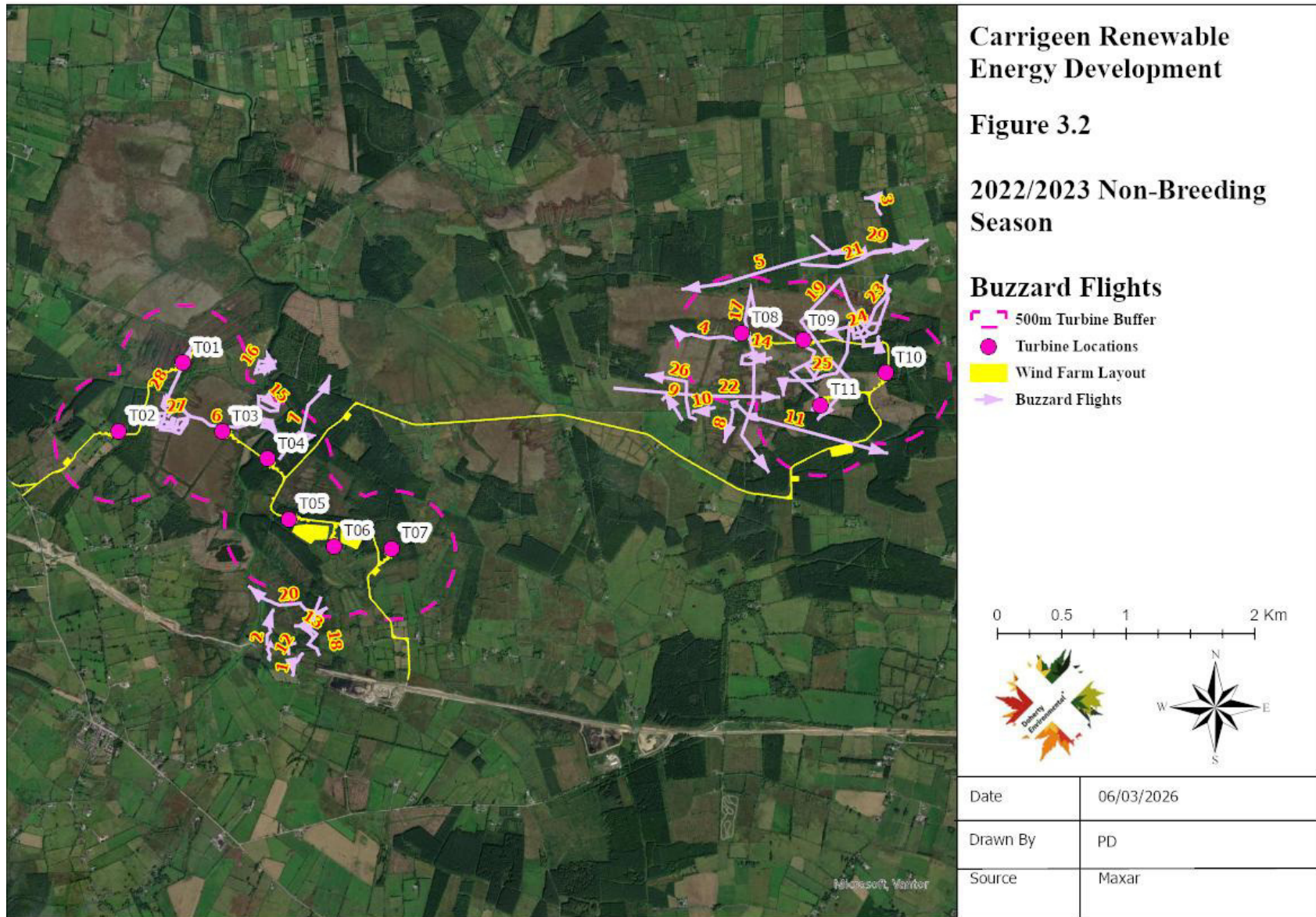
**Figure 3.8** shows the Sparrowhawk flights observed during the 2022-2023 non-breeding season.

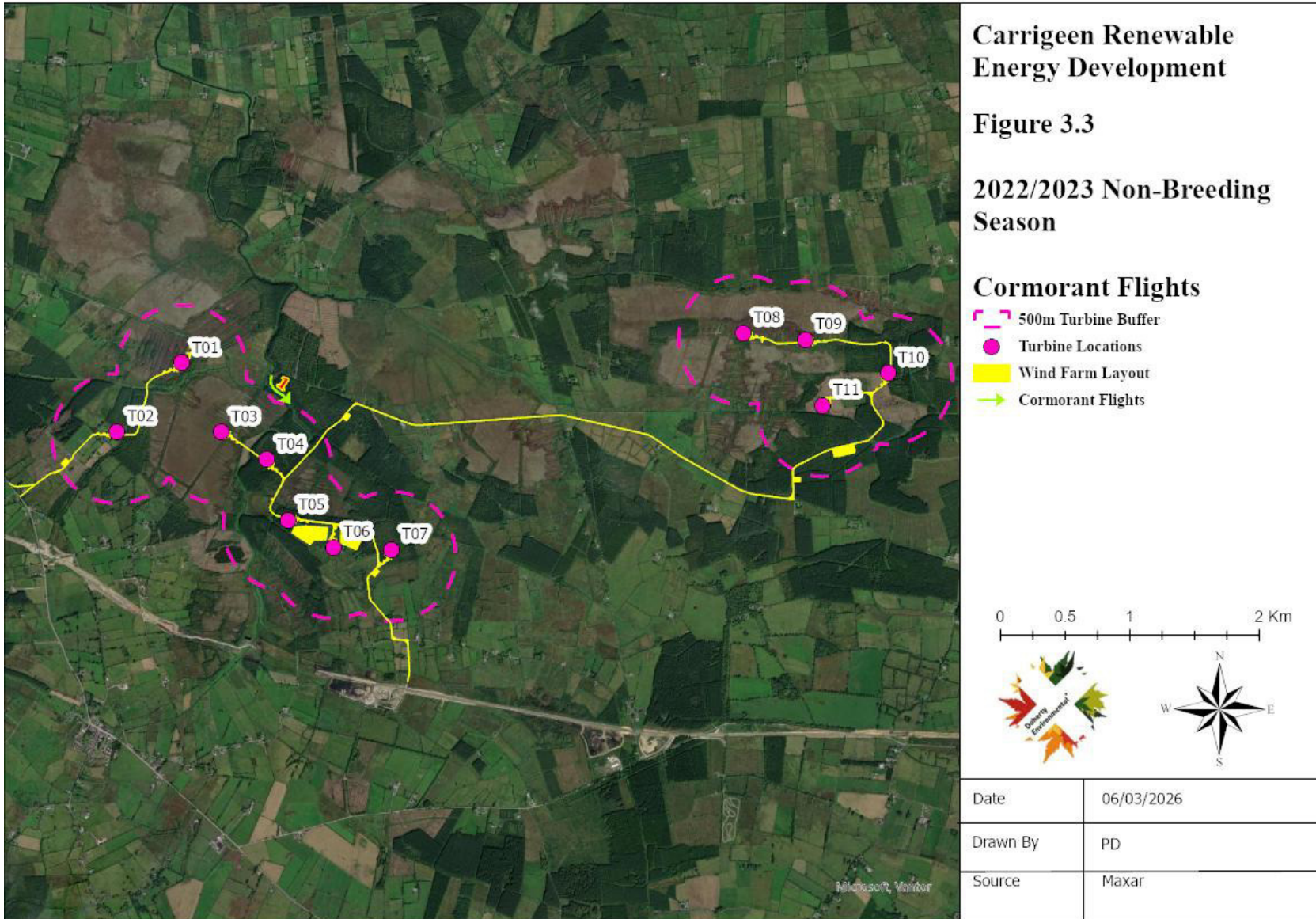
### **3.1.8 Snipe**

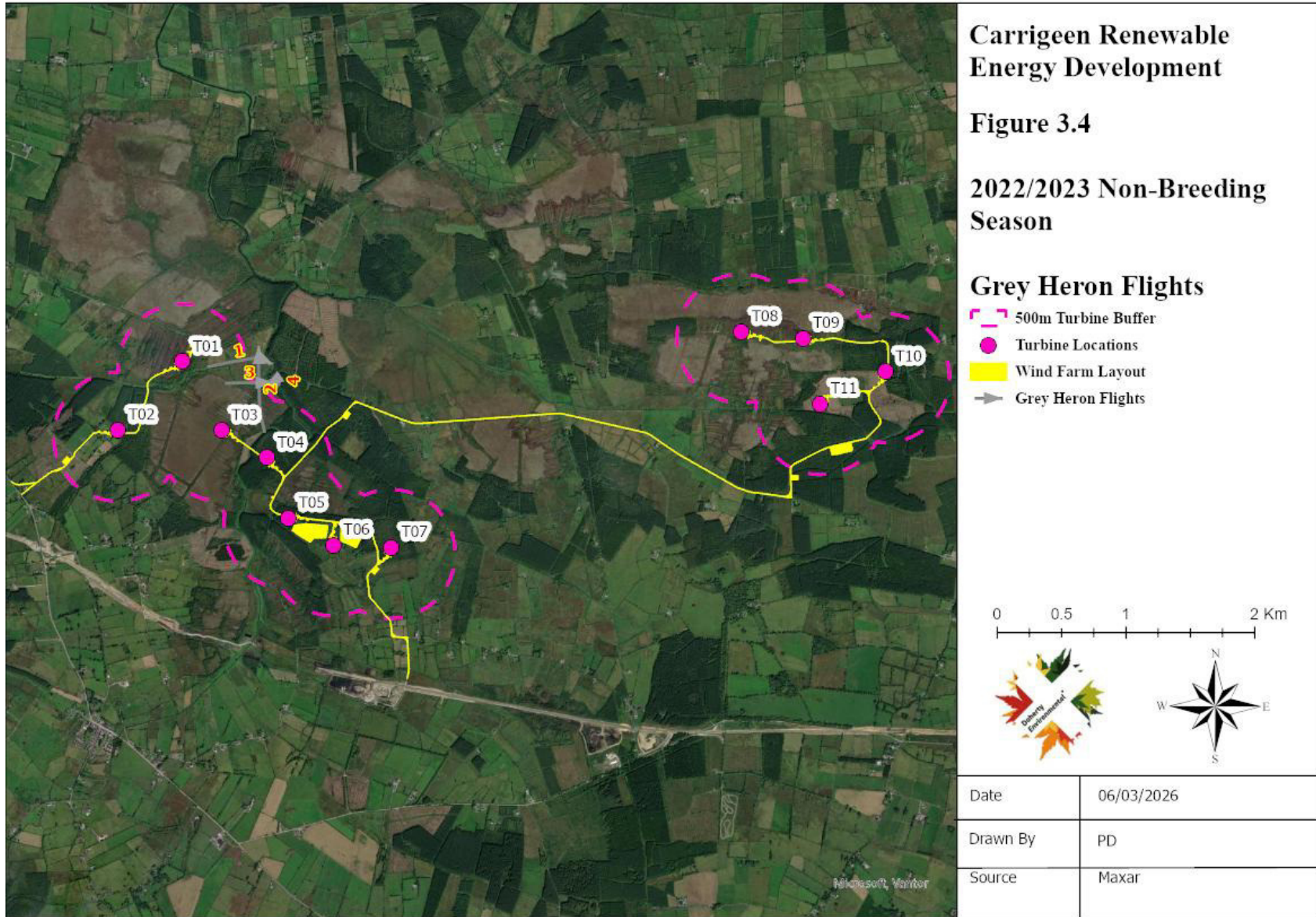
Six no. flights of individual Snipe were observed during the non-breeding season. All flights were of short duration (less than 15 seconds) at low height over the ground at <20m and were representative of vigilant, flushed flights.

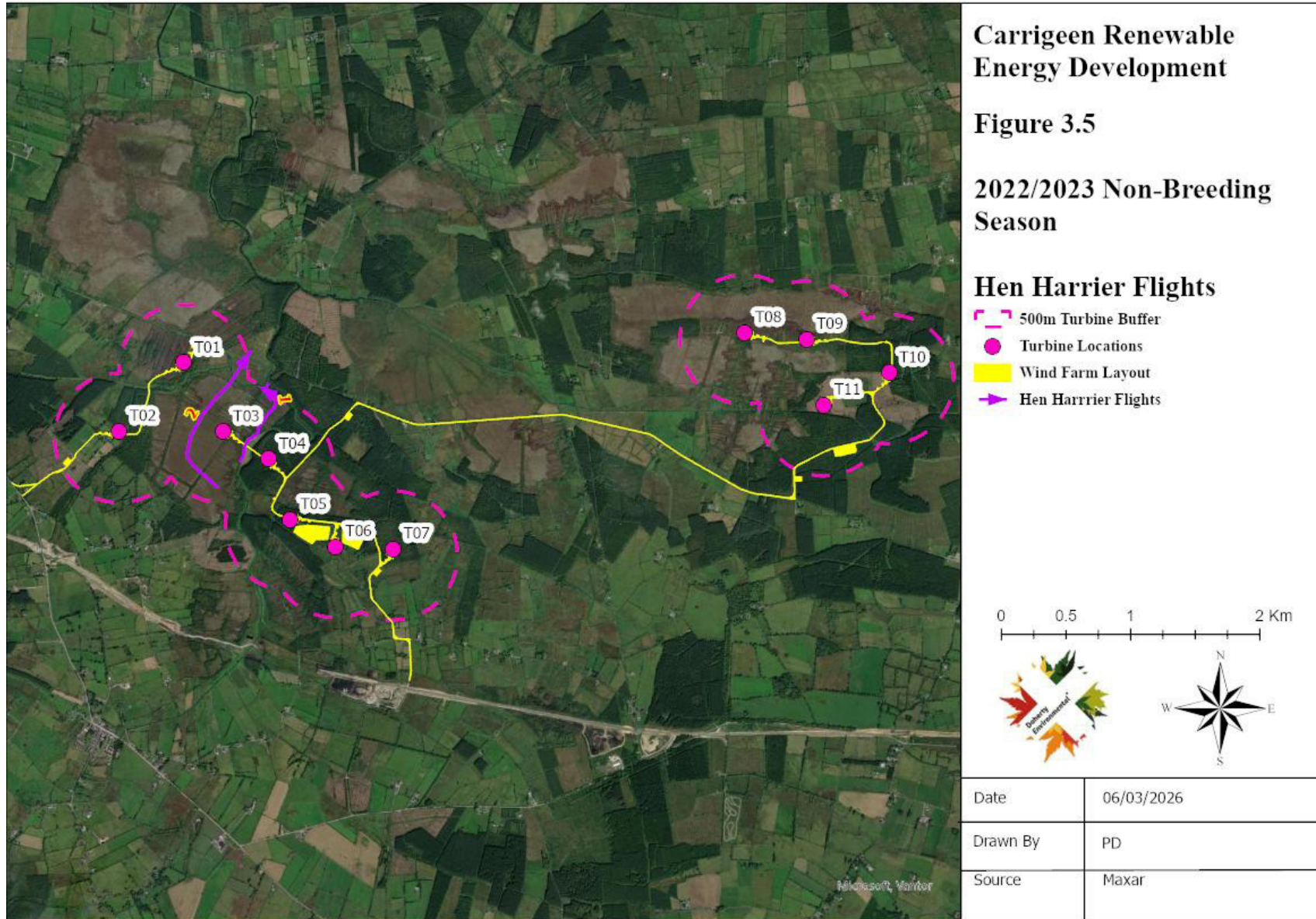
**Figure 3.9** shows the Snipe flights observed during the 2022-2023 non-breeding season.

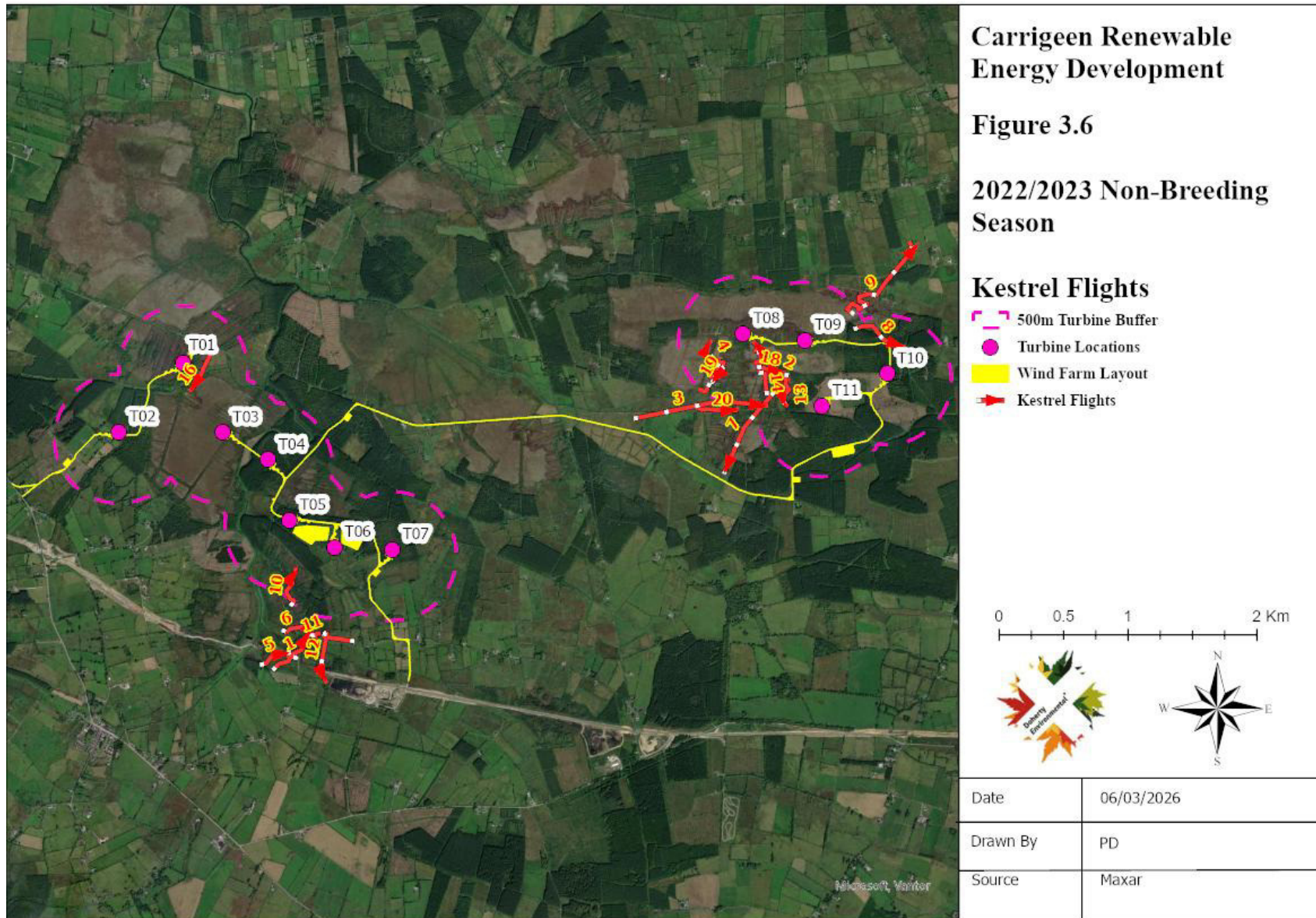


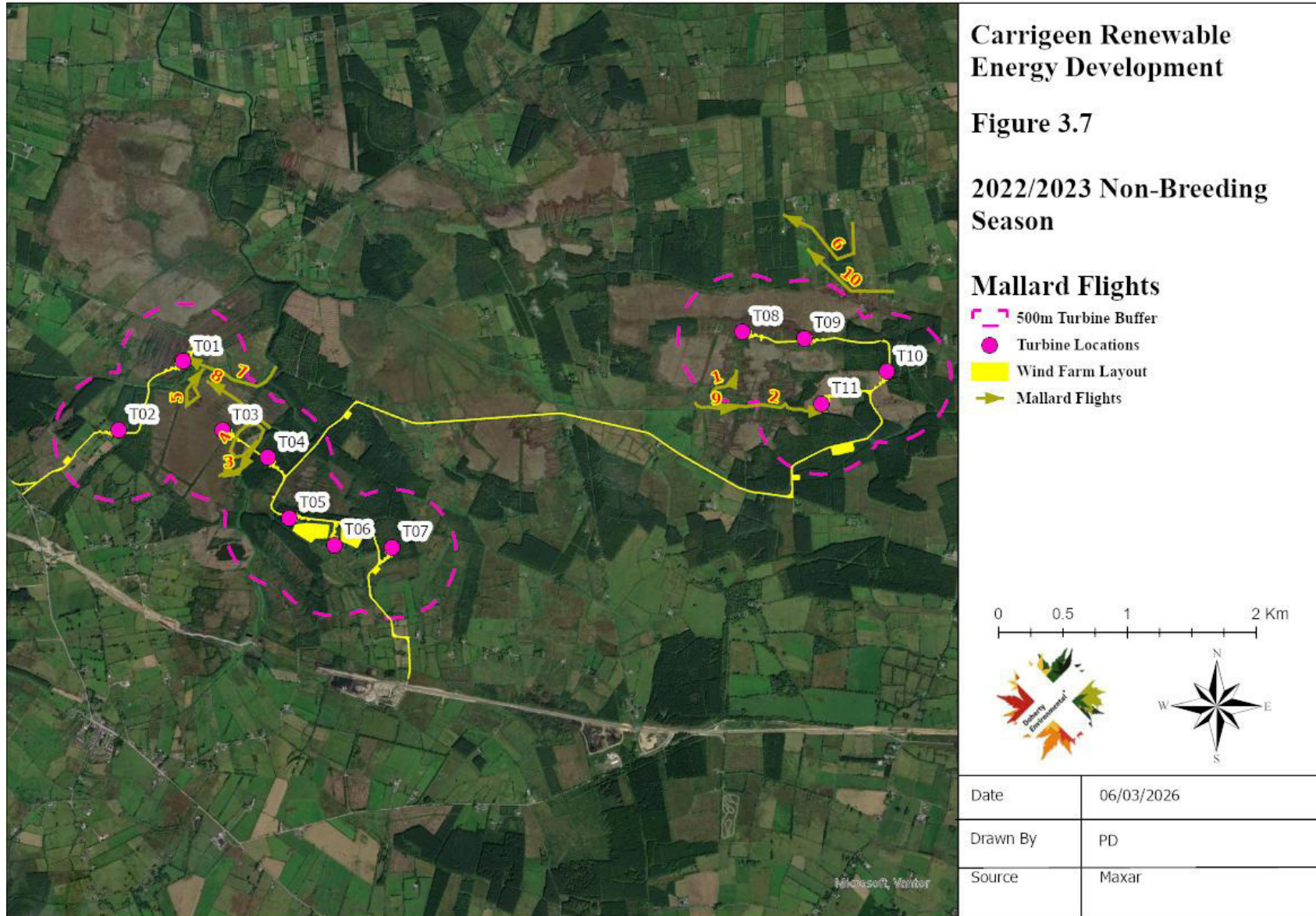


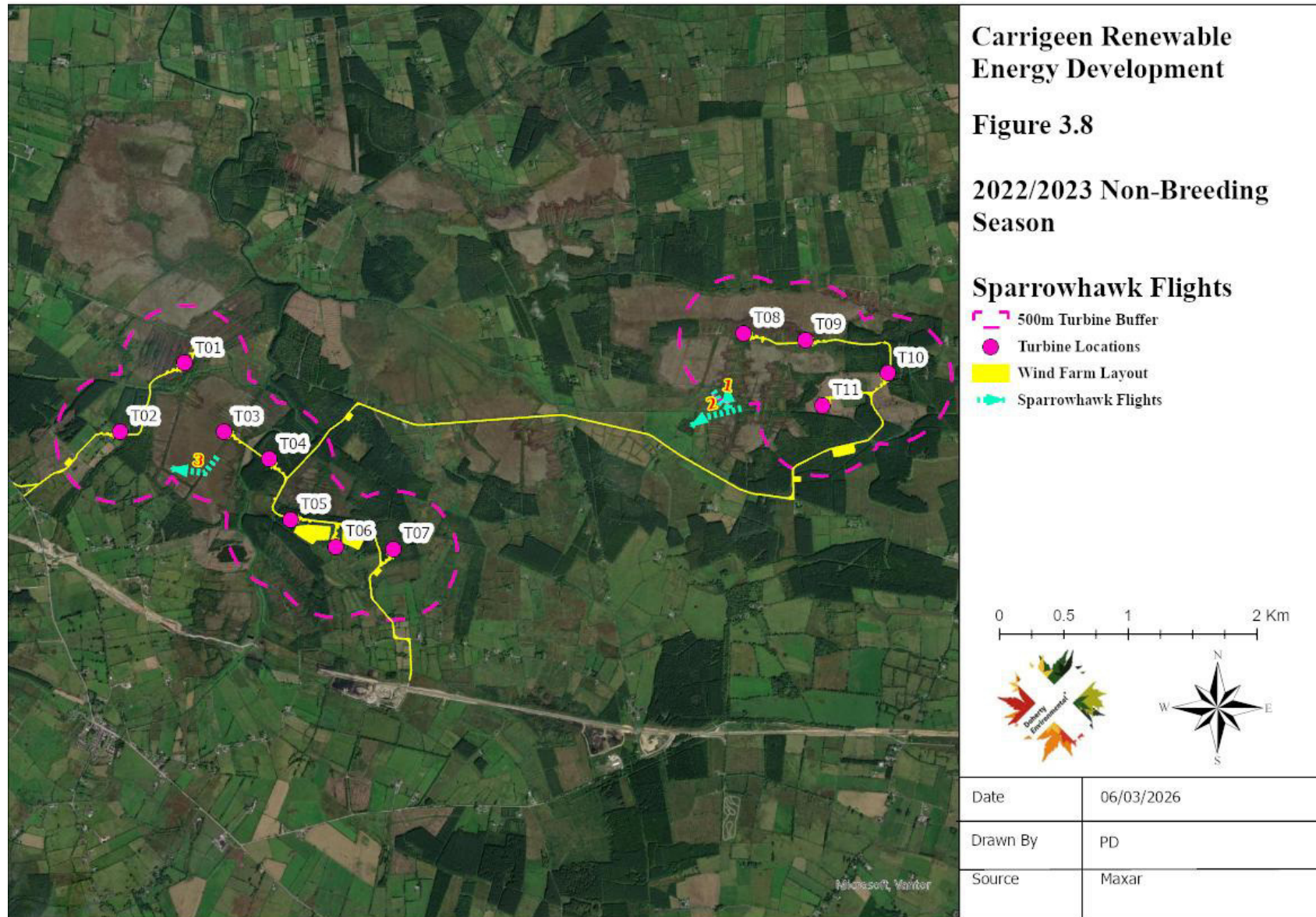


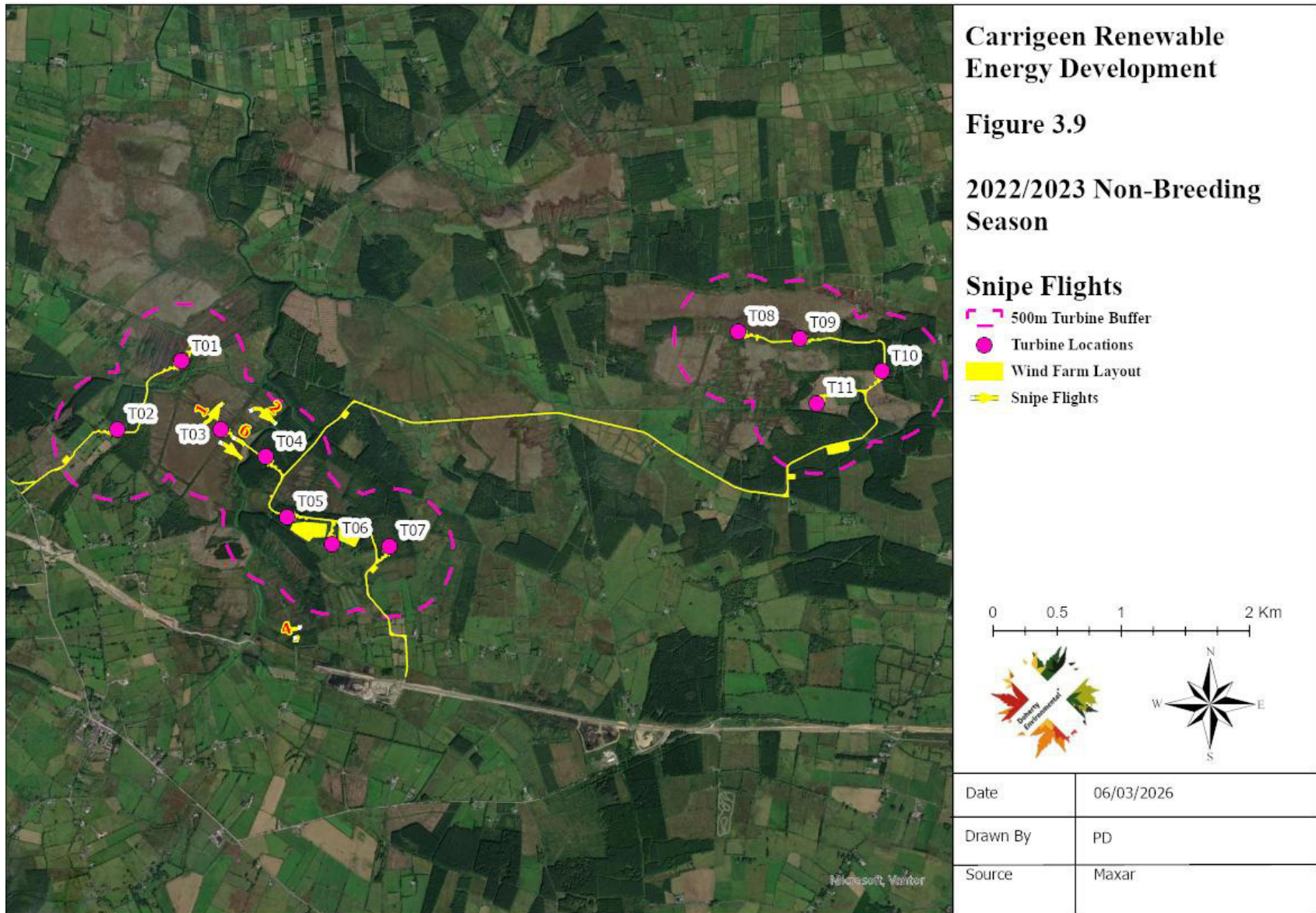












## **4.0 CONCLUSION**

During the 2022/2023 non-breeding season surveys vantage point were completed for the Project.

During the vantage point surveys a total of 75 flightlines were recorded comprising 8 no. target species. The activity recorded during the vantage point surveys was dominated by Buzzard and Kestrel both of which accounted for >65% of all flight activity recorded. Low levels of flight activity for Hen Harrier, Heron, Cormorant, Mallard, Snipe and Sparrowhawk were recorded.

A total of 2 red-listed species of high conservation concern (Kestrel & Snipe) and 2 amber-listed species of amber conservation concern (Hen Harrier; Cormorant) were recorded.

Hen Harrier was the only bird species that is listed on Annex 1 of the EC Birds Directive recorded during the vantage point surveys.





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Final	1	Pat Doherty MSc, MCIEEM

This report has been prepared by Doherty Environmental Consultants (DEC) Ltd with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

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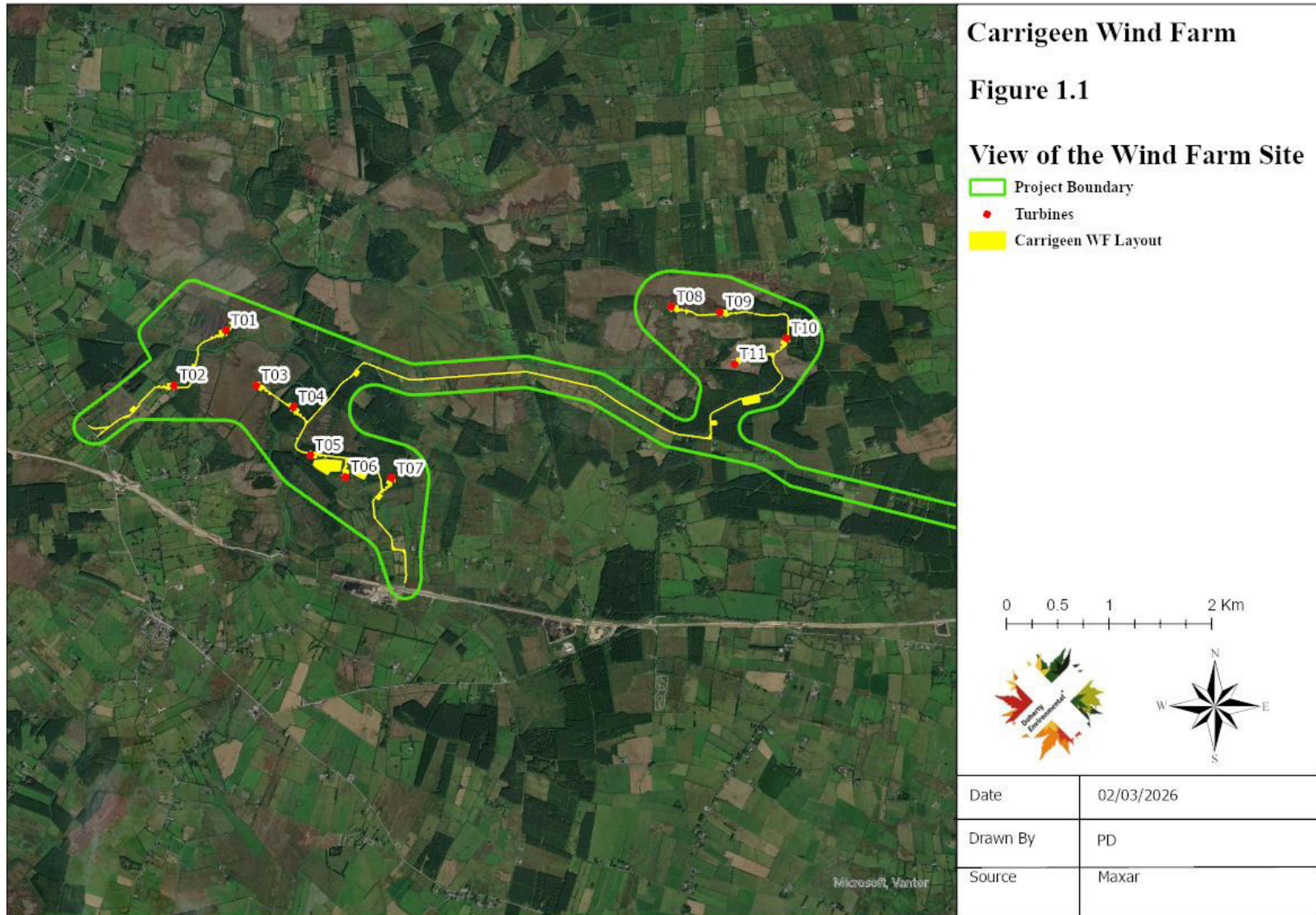
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## **1.0 INTRODUCTION**

Doherty Environmental Consultants (DEC) Ltd have been contracted to carry out ornithological surveys on behalf of Carragain Power Ltd. for the proposed Carrigeen Renewable Energy Development, Co. Roscommon, which consists of a Wind Farm Site, a Grid Connection, and Turbine Delivery Route (altogether the Project). An aerial view of the Wind Farm Site is shown on Figure 1.1.

Surveys commenced at the Wind Farm Site in late March 2022. This report provides details of the surveys completed during the 2023 breeding season (April 2023 to September 2023). The 2023 breeding season represents the second round of breeding season ornithological surveys completed for the proposed Project.

The surveys have been undertaken in order to provide a baseline environmental data set, which will be incorporated into the Environmental Impact Assessment (EIA) for the project as required under EU EIA Directive (Council Directive 2011/92/EU, amended in 2014/52/EU).



## 2.0 METHODOLOGY

### 2.1 VANTAGE POINT SURVEYS

The primary objective of the bird surveys completed for the proposed Project is to:

- Establish the presence and behaviour of raptors, waterbirds and other bird species known to be sensitive to collision with wind turbines over the Wind Farm Site;
- Obtain data on the movements of target species which would facilitate an analysis of foraging activity and collision risk;
- Identify any flight paths used by breeding waterfowl.

The bird surveys involved vantage point surveys of the buildable area. The methodology adopted for the 2023 breeding season vantage point surveys was derived from the Scottish Natural Heritage<sup>1</sup> (SNH) *Recommended bird survey methods to inform impact assessment of onshore wind farms* (2017). SNH guidance for surveys at wind farms recommend that field surveys focus on those species of high nature conservation value for which there is potential for impacts to occur. These target species in Ireland are derived from the following sources:

- Special conservation interest (SCI) bird species of the Special Protection Areas (SPAs) that occur within the zone of influence of a project; and
- those species that are of medium (amber) and high (red) conservation concern (i.e. Red Listed species).

Where species that are included under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;

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<sup>1</sup> Now known as Nature Scot.

- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >200m; 20m to 200m; and <20m<sup>2</sup>; and
- The behaviour of the target species.

SNH guidance (SNH, 2017) outlines specific survey methodologies for onshore wind farm developments. These guidelines recommend that vantage point surveys should be completed across all calendar months when the species is present or likely to be so.

Four vantage points (**VP1** to **VP4**) were used for monitoring of the proposed Wind Farm Site and surrounding area. The location of these vantage points are shown on **Figure 2.1**.

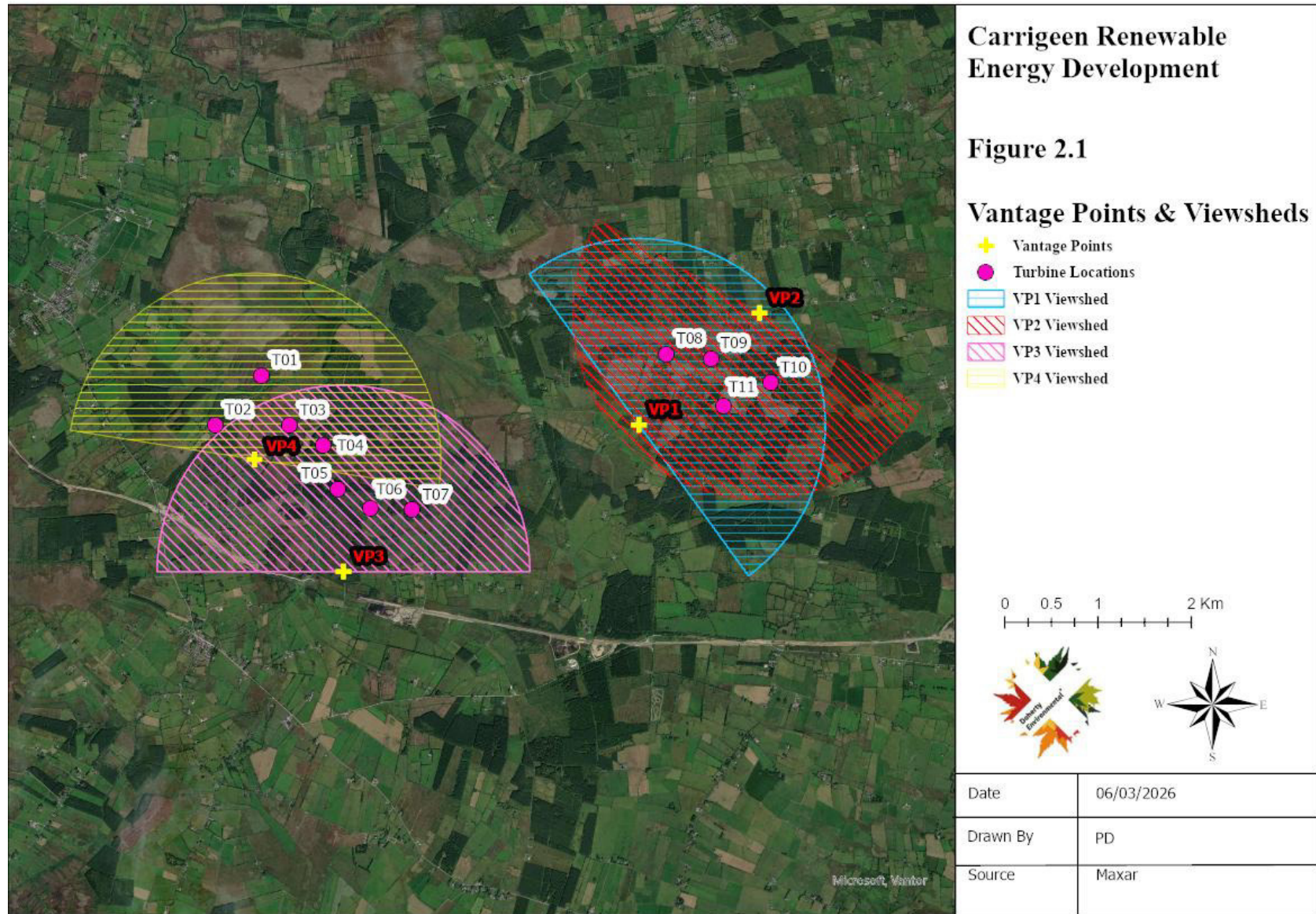
The vantage points were selected following a viewshed analysis of the proposed Wind Farm Site and a 500m buffer area surrounding the Wind Farm Site. The viewshed analysis was completed using QGIS software and is based on an observer height of 1.6m and an observable viewshed from the observer point at a height of 20m. The viewshed afforded from VP1 and VP4 is shown on **Figure 2.1**.

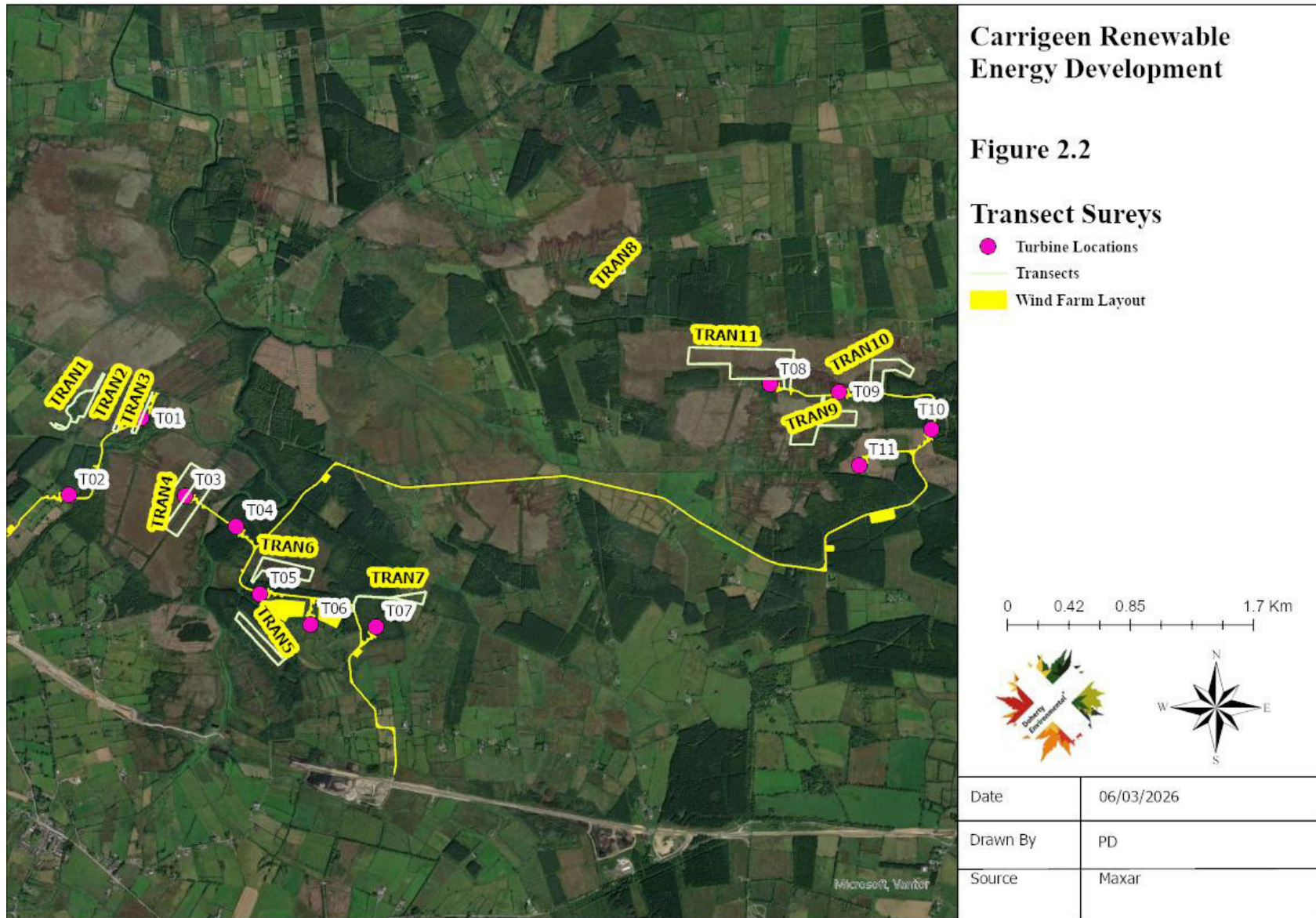
Surveys during the 2023 breeding season commenced in April 2023 and continued monthly until September 2023.

A minimum of 36 hours surveying was completed at all vantage point locations during the breeding season between April 2023 and September 2023. The vantage point surveys were completed by undertaking two watches of a duration of 3 hours from each point per month.

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<sup>2</sup> The flight bands are based on the minimum and maximum height (i.e. 22m and 185m respectively) of the rotor blade sweep of typical commercial wind turbines.





## 2.2 BREEDING SEASON TRANSECT SURVEYS

Breeding season transect surveys were completed to record the bird assemblages occurring at the proposed Wind Farm Site. A total of 11 no. transects were completed during the 2023 breeding season. The location and extent of each transect is shown on **Figure 2.2**.

The methodology used was a combination of the Brown and Shepherd (1993), Moorland Bird Survey (MBS) and Common Bird Census techniques. Surveys were undertaken in suitable weather conditions, avoiding times of heavy and persistent rain and strong winds.

Each transect was walked at a steady slow walking speed and all birds seen and heard were recorded. Visual observations of birds were aided by the use of binoculars. The species and number of birds occurring along transects were recorded so that the species assemblage and associated abundance along each transect could be established.

## 3.0 RESULTS

### 3.1 VANTAGE POINT

A total of 36 hours of vantage point watching was completed from each vantage point VP1 to VP4 during the October to March vantage point surveys.

A total of 6 target species were recorded during the breeding season vantage point surveys. These species (BTO Code in parenthesis) and their current conservation status are as follows:

**Buzzard (BZ):** conservation status = Green Low conservation concern

**Greater Black-Backed Gull (GB):** conservation status = Green (Breeding and Wintering) Low conservation concern

**Grey Heron (H.):** conservation status = Green Low conservation concern

**Hen Harrier (HH):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Kestrel (K.):** conservation status = Red (for Breeding Kestrel) High conservation concern

**Mallard (MA):** conservation status = Green Low conservation concern

Of the bird species recorded only Hen Harrier is listed on Annex 1 of the EC Birds Directive.

A total of 63 flights by target species were recorded during the breeding season. **Figure 3.1** shows all flights observed during the vantage point surveys. The percentage breakdown of flights recorded per species are set out in Table 3.1 below.

**Table 3.1: Vantage Point Flight lines recorded during the 2023 Breeding Season**

Species	No. Flights	Percentage Flights
Buzzard	25	40%
Greater Black-Backed Gull	1	2%
Grey Heron	5	8%
Hen Harrier	1	2%
Kestrel	25	40%
Mallard	6	10%

A summary of the observations for each target species is provided in the following subsections.

### **3.1.1 Buzzard**

Buzzard was the most frequently observed species during the 2023 breeding season vantage point surveys. A total of 25 Buzzard flights were observed during the breeding season. The

number of birds recorded during individual flight observations were exclusively of one bird. This species was typically recorded flying within the <20m and 20 to 200m height band, with a lower number of flights being recorded at higher elevation >200m.

The range of activity recorded during flights included hunting, commuting, soaring, being mobbed by hooded crows; landing to perch on trees.

**Figure 3.2** shows all Buzzard flights observed during the 2023 breeding season.

### **3.1.2 Greater Black-Backed Gull**

One Greater Black-Backed Gull flight was observed from VP4 during the 2023 breeding season. The bird was seen flying at height commuting from southeast to west/northwest to the south of the wind farm western parcel.

**Figure 3.3** shows the Greater Black-Backed Gull flight observed during the 2023 breeding season.

### **3.1.3 Grey Heron**

A total of 5 Grey Heron flights were observed during the 2023 breeding season. All flights were observed flying low at <20m. All flights observed were of individual herons.

**Figure 3.4** shows the Grey Heron flights observed during the 2023 breeding season.

### **3.1.4 Hen Harrier**

One no. Hen Harrier flights were observed during the 2023 breeding season, comprising one male flight during September. The flight was presentative of a foraging bout at a low altitude close to the ground. The flight was observed for c. 75 seconds.

**Figure 3.5** shows the Hen Harrier flight observed during the 2023 breeding season.

### **3.1.5 Kestrel**

A total of 25 Kestrel flights were observed during the 2023 breeding season. All observations bar one were of an individual kestrel. The majority of the Kestrel flights were observed within the 20m to 200m range at a heights of c. 40m to 100m.

**Figure 3.6** shows all Kestrel flights observed during the 2023 breeding season.

### **3.1.6 Mallard**

A total of 6 no. Mallard flights were recorded during the 2023 breeding season. All flights were recorded at low height at <20m and within the lower range (i.e. less than 100m) of the 20m to 200m band. All flights were of a short duration, at less than 45 seconds.

**Figure 3.7** shows the Mallard flights observed during the 2023 breeding season.







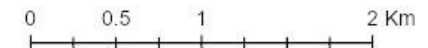
## Carrigeen Renewable Energy Development

Figure 3.1

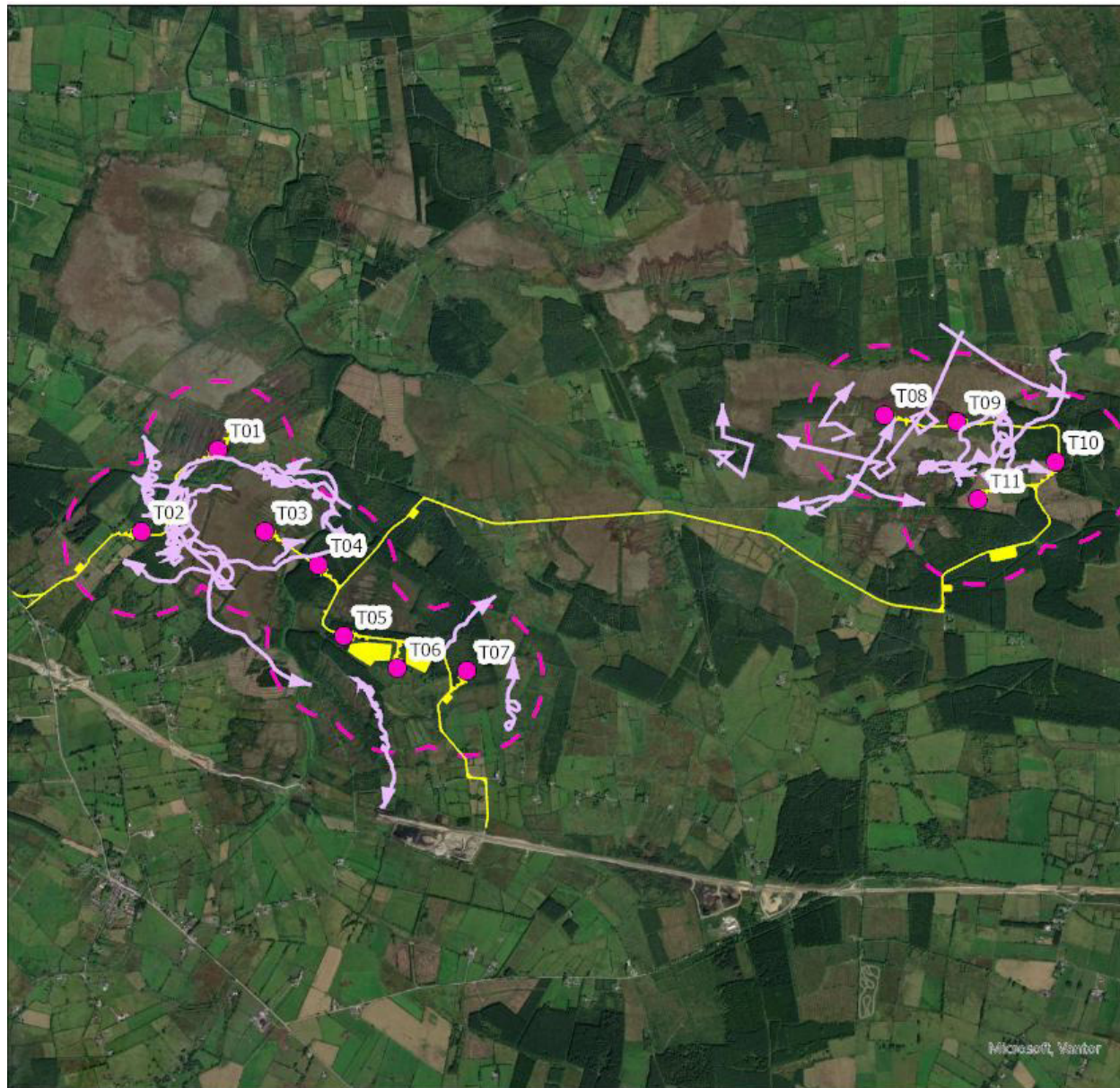
2023 Breeding Season

### All Target Species Flights

-  500m Turbine Buffer
-  Turbine Locations
-  Wind Farm Layout
-  All Target Species Flights



Date	06/03/2026
Drawn By	PD
Source	Maxar







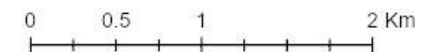
## Carrigeen Renewable Energy Development

Figure 3.2

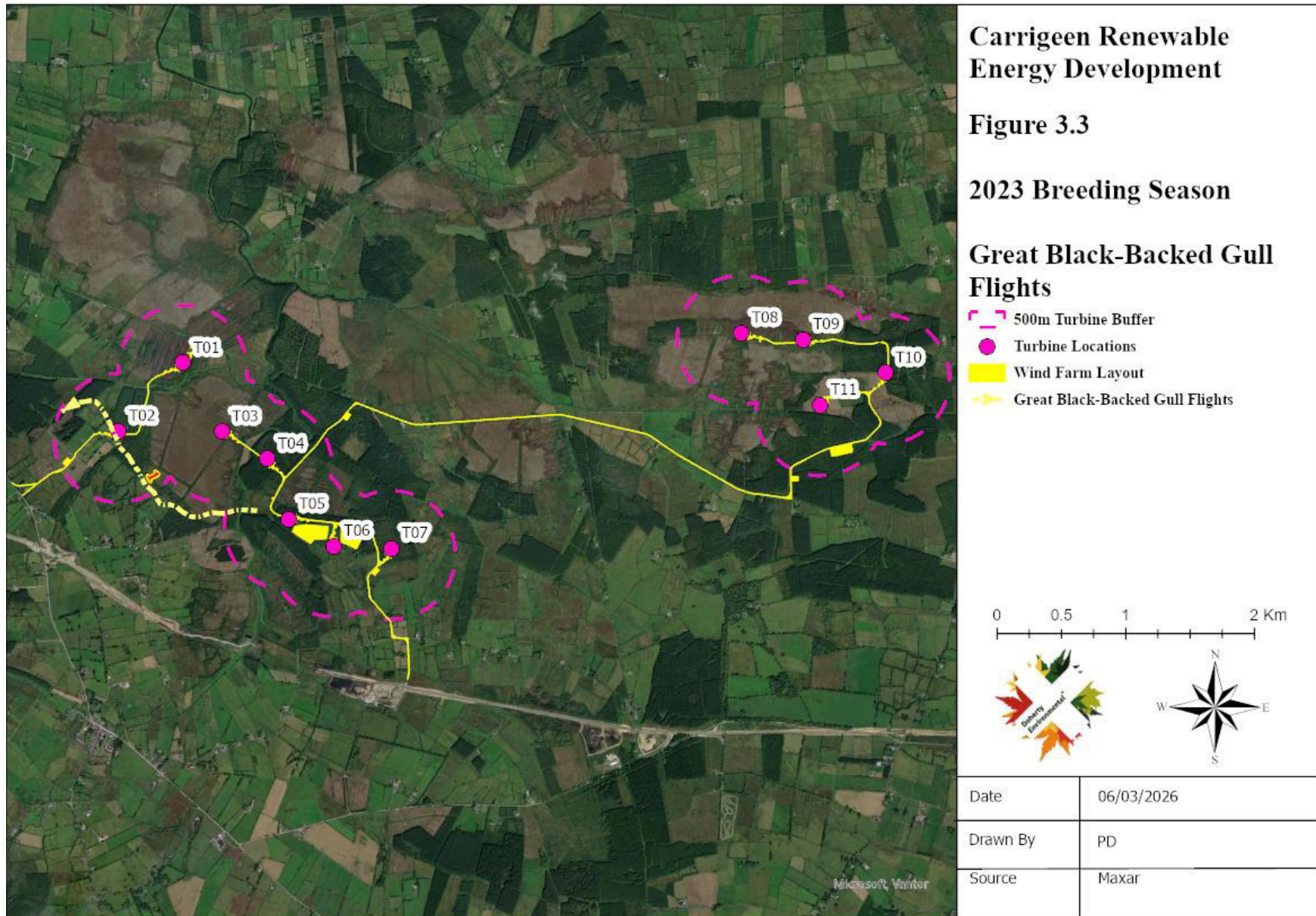
### 2023 Breeding Season

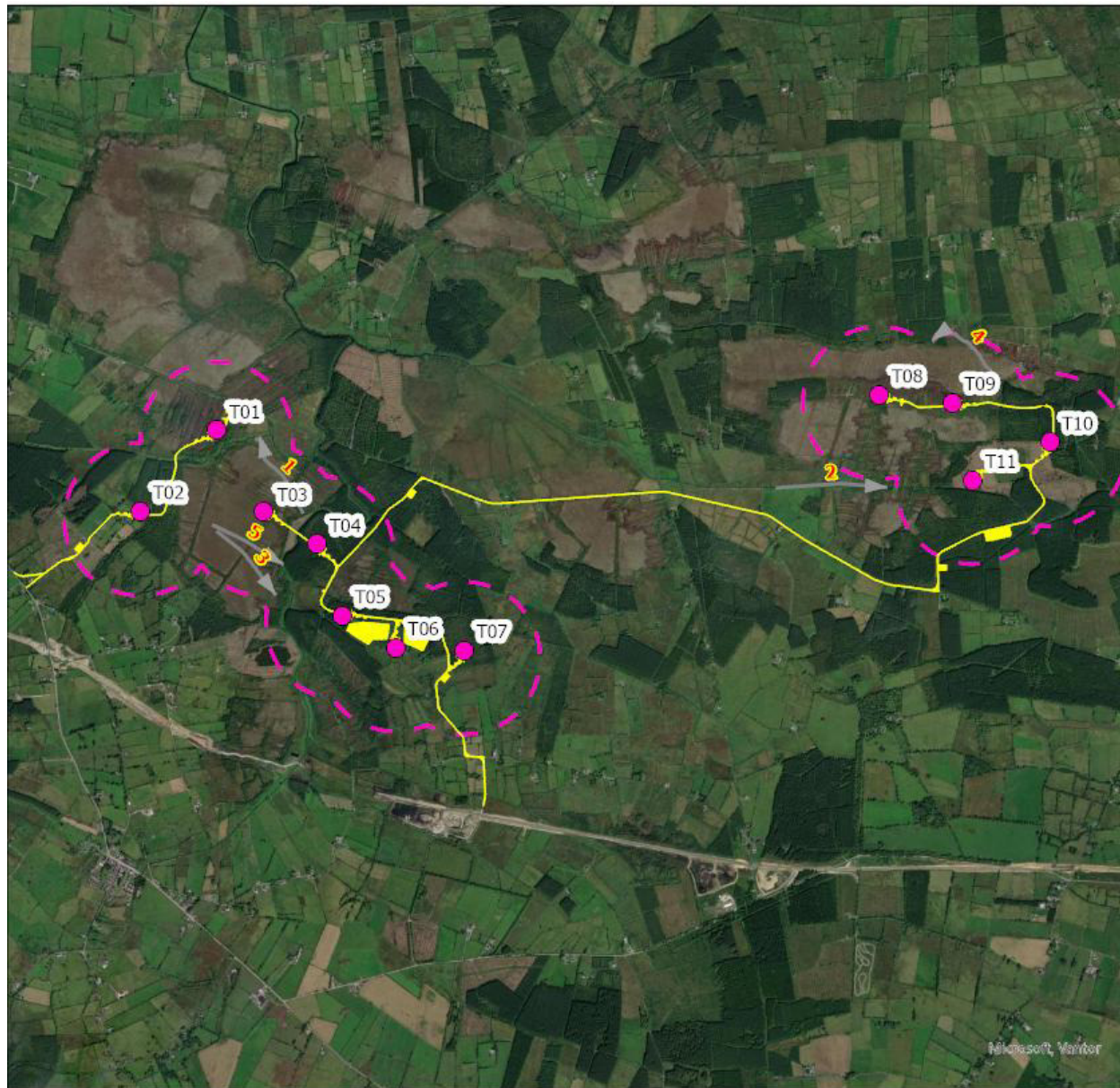
#### Buzzard Flights

-  500m Turbine Buffer
-  Turbine Locations
-  Wind Farm Layout
-  Buzzard Flights



Date	06/03/2026
Drawn By	PD
Source	Maxar





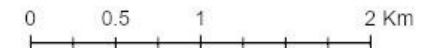
## Carrigeen Renewable Energy Development

Figure 3.4

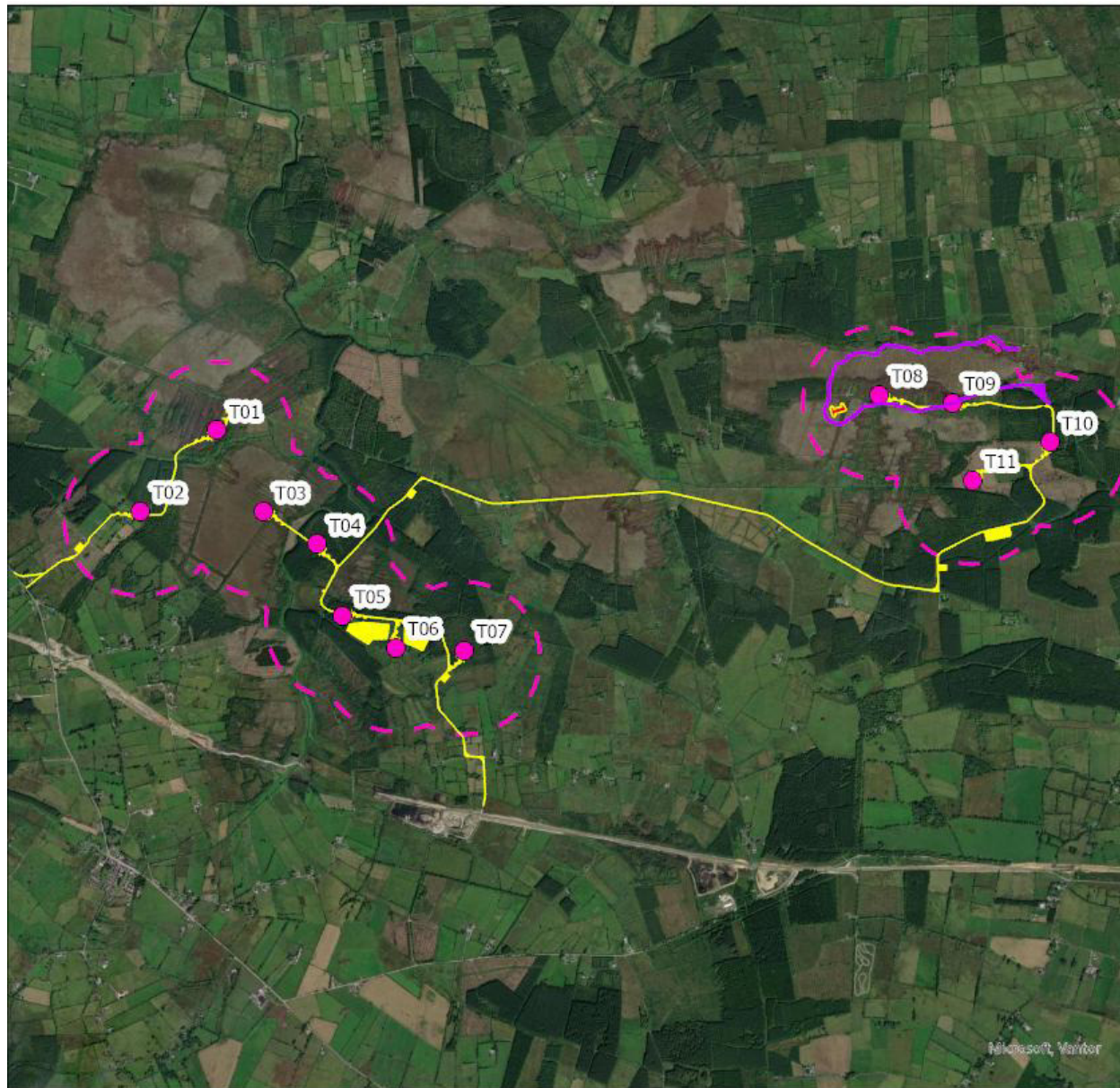
### 2023 Breeding Season

#### Grey Heron Flights

- 500m Turbine Buffer
- Turbine Locations
- Wind Farm Layout
- Grey Heron Flights



Date	06/03/2026
Drawn By	PD
Source	Maxar



## Carrageen Renewable Energy Development

Figure 3.5

2023 Breeding Season

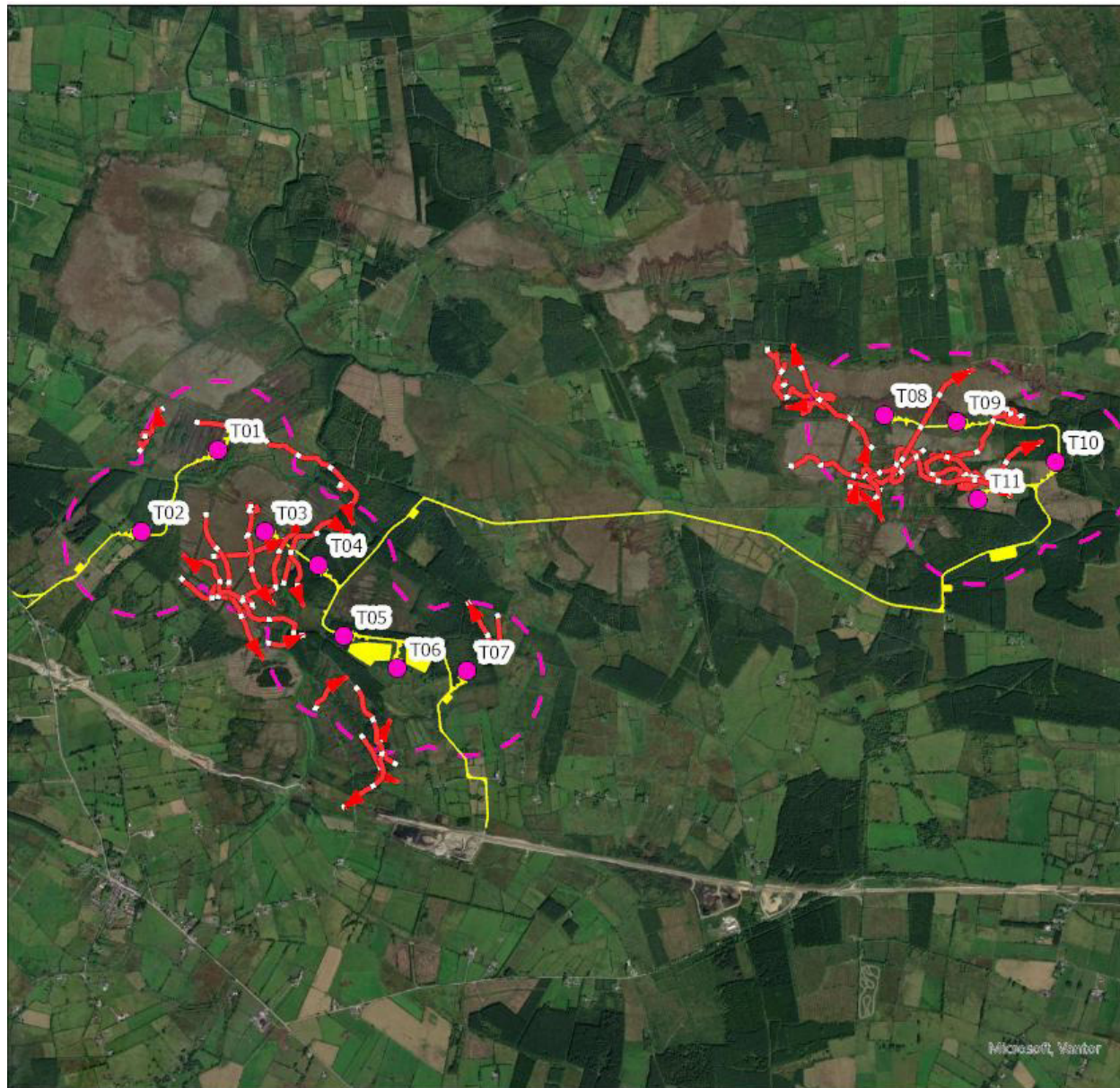
### Hen Harrier Flights

- 500m Turbine Buffer
- Turbine Locations
- Wind Farm Layout
- Hen Harrier Flights

0 0.5 1 2 Km



Date	06/03/2026
Drawn By	PD
Source	Maxar






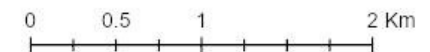
## Carrigeen Renewable Energy Development

Figure 3.6

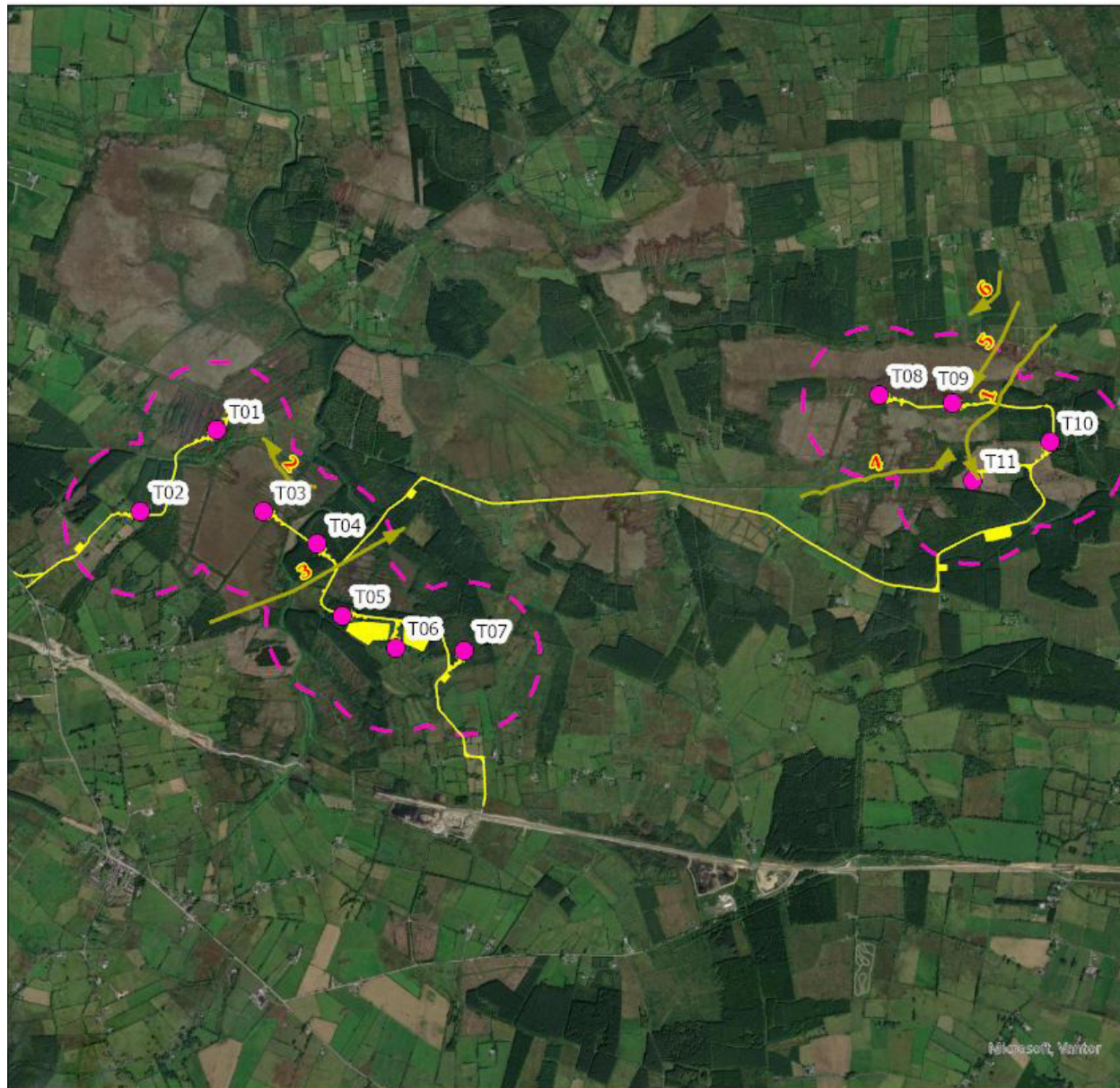
### 2023 Breeding Season

#### Kestrel Flights

-  500m Turbine Buffer
-  Turbine Locations
-  Wind Farm Layout
-  Kestrel Flights



Date	06/03/2026
Drawn By	PD
Source	Maxar



## Carrageen Renewable Energy Development

Figure 3.7

### 2023 Breeding Season

#### Mallard Flights

- 500m Turbine Buffer
- Turbine Locations
- Wind Farm Layout
- Mallard Flights

0 0.5 1 2 Km



Date	06/03/2026
Drawn By	PD
Source	Maxar

## 3.2 TRANSECT SURVEYS

The results of the transect surveys completed between April 2023 and September 2023 are provided in Table 3.2 below. A total of 46 species were recorded during the breeding season transect surveys. The majority of the species recorded are of low conservation concern (Green-listed species). Nine species of medium conservation concern (Amber-listed species) were recorded. These are Goldcrest, Greenfinch, House Sparrow, Linnet, Mallard, Skylark, Starling, Swallow and Willow Warbler. Three species of high conservation concern (Red-Listed Species), namely Kestrel, Meadow Pipit and Snipe were recorded during the survey. Kestrel were recorded along transect 1 and transect 11. Meadow Pipit was recorded from all transects with the exception of Transect 8. Meadow pipit was recorded breeding in the vicinity of Transect 1, 2, 4, 5, 6, 9, 10 and 11. Snipe was recorded along Transect 1, 4, 9, 10 and 11. No evidence of display or calling were recorded and the snipe observed were considered to be breeding roosting individuals.

**Table 3.2: 2023 Breeding Transect Survey Results**

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			17/4	19/5	12/7	13/4	18/5	06/6	12/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6
Blackbird	Green	No	1		1	3	2	3	1	2	1	2	3	2	3	2	1	1		
Blackcap	Green	No				1		1	1											
Blue Tit	Green	No				2	3	1	1	2	1	1	1	1	1		2	1	2	1
Bullfinch	Green	No						1												
Buzzard	Green	No				1			1						1					
Chaffinch	Green	No	2	3	5	2	3	1	2	3	1	4	2	4	6	3	3	3	4	4
Chiffchaff	Green	No				1	3	1	2	2	1	1	1		2		1	1		
Coal Tit	Green	No		3	3	2	2	2	1	2	2	3	2	1	1	1	1	2	3	3
Crossbill	Green	No													2	6		4	4	
Cuckoo	Green	No																		
Dunnock	Green	No	1		3	1	1	1		1		1			1					
Fieldfare	Green	No																		
Golderest	Amber	No		3	3	1	2	1	3	2	2			1	3	3	2	4	4	4
Goldfinch	Green	No																12		
Great Tit	Green	No	2	1	1	1	2	1	1		1	1	1	1	1	1		2	2	1
Greenfinch	Amber	No											1							
Grey Heron	Green	No																		
Hen Harrier	Amber	Yes																		
Hooded Crow	Green	No	4		3	1		1										2	3	
House Martin	Amber	No																		
House Sparrow	Amber	No																		
Jay	Green	No				1									1				1	
Jackdaw	Green	No					1													
Kestrel	Red	No	1																	

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			17/4	19/5	12/7	13/4	18/5	06/6	12/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6
Lesser Black-backed Gull	Amber	No																		
Lesser Redpoll	Green	No	1	1			2	1	1	1	1							2	2	
Linnet	Amber	No	2	3	1	1	1		1	2	1	1		1				1	1	1
Long-tailed Tit	Green	No	4	5	1	2	3	2	3	2	2	2	2					4		2
Magpie	Green	No			1	1	2						1		3					
Mallard	Amber	No						2			2									
Meadow Pipit	Red	No	6	7	5	3	2	1	1	2	1	3	4	4	2		3	4	2	3
Mistle Thrush	Green	No																		
Pheasant	Green	No				1					1								1	
Pied Wagtail	Green	No		1			1	1		1		1							1	
Raven	Green	No	1																	
Red Wing	Red	No																		
Reed Bunting	Green	No				1	1		1	1	1									
Robin	Green	No	2	1	5		2	3	2	2	1	2		2	2	3	2	2	3	
Rook	Green	No		3											3	4				
Siskin	Green	No	6	3	5	1	1	1				2	3	1						
Skylark	Amber	No	8	5	5	3	1	1				3	5		5	3	3			
Snipe	Red	No		3	4							3	4	3						
Song Thrush	Green	No										1	3							
Sparrowhawk	Green	No																		
Starling	Amber	No																4	2	2
Stonechat	Green	No	1	1	2	2	1	2	2	2	1	3						1	1	1
Swallow	Amber	No		5	8	2	4	5	3	4	4				3	6	2	6	4	4
Teal	Amber	No																		
Treecreeper	Green	No							1	1	1									
Whitethroat	Green	No																		

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			17/4	19/5	12/7	13/4	18/5	06/6	12/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6
Willow Warbler	Amber	No		3	3	3	5	4		3	2	3	2	2	2	3	3			
Woodpigeon	Green	No	2	1	3	2	3	2	2	6		4			1		3		2	5
Wren	Green	No	2	2	3	2	1	3	2	1	2	1	1	3	5	3		2	1	1

Species	BoCCI	Annex 1	Transect 6			Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			13/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6	17/4	19/5	12/7	17/4	19/5	12/7	17/4	19/5	12/7
Blackbird	Green	No	1			2	4	4						1		1	1			1
Blackcap	Green	No							1	3										
Blue Tit	Green	No	1	2	1	1	1	1						2	1	1				
Bullfinch	Green	No						1		1		1		1						
Buzzard	Green	No																		
Chaffinch	Green	No	3	4	4	6	3	3	3	3	2			3	3	2	2	3	5	
Chiffchaff	Green	No	1	1			1	1				2	1	1						
Coal Tit	Green	No	2	3	3	3	2	3	1	1	1	1	1	1	2	1		3	3	
Crossbill	Green	No	4	4								1			2	2	2			
Cuckoo	Green	No				1														
Dunnock	Green	No				1			1	2	2			1			1		3	
Fieldfare	Green	No																		
Goldcrest	Amber	No	4	4	4	3	4	4										3	3	
Goldfinch	Green	No	12									1	3	3						
Great Tit	Green	No	2	2	1	2	2	1	1	2	2				1	2	2	2	1	1
Greenfinch	Amber	No										2	4	2						
Grey Heron	Green	No																		

Species	BoCCI	Annex 1	Transect 6			Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			13/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6	17/4	19/5	12/7	17/4	19/5	12/7	17/4	19/5	12/7
Hen Harrier	Amber	Yes																		
Hooded Crow	Green	No	2	3		2	3		2			3		2	2			4		3
House Martin	Amber	No																		
House Sparrow	Amber	No							10	2	2									
Jay	Green	No		1																
Jackdaw	Green	No					3						3	3						
Kestrel	Red	No																1		
Lesser Black-backed Gull	Amber	No																		
Lesser Redpoll	Green	No	2	2		1	1	1				1	1	1				1	1	
Linnet	Amber	No	1	1	1				1		3	1	1	1				2	3	1
Long-tailed Tit	Green	No	4		2	2	2		2			3	2	3				4	5	1
Magpie	Green	No				1		1												1
Mallard	Amber	No																		
Meadow Pipit	Red	No	4	2	3	1		1				9	5	7	4	5		6	7	5
Mistle Thrush	Green	No																		
Pheasant	Green	No		1									2							
Pied Wagtail	Green	No		1		1		1							1				1	
Raven	Green	No												1				1		
Red Wing	Red	No																		
Reed Bunting	Green	No																		
Robin	Green	No	2	3		2	2	1	3	2	2	3		2				2	1	5
Rook	Green	No							2		2	2		4					3	
Siskin	Green	No				1	1	1								1	1	6	3	5
Skylark	Amber	No				2	1					6		2	2	2		8	5	5
Snipe	Red	No										1		1	1	1			3	4

Species	BoCCI	Annex 1	Transect 6			Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			13/4	18/5	06/6	13/4	18/5	06/6	13/4	18/5	06/6	17/4	19/5	12/7	17/4	19/5	12/7	17/4	19/5	12/7
Song Thrush	Green	No				1	2													
Sparrowhawk	Green	No																		
Starling	Amber	No	4	2	2	6		12				1								
Stonechat	Green	No	1	1	1	2	4		2	2	2						1	1	2	
Swallow	Amber	No	6	4	4	4	5	7				2	5	1				5	8	
Teal	Amber	No																		
Treecreeper	Green	No				1	1													
Whitethroat	Green	No				1			1	1										
Willow Warbler	Amber	No					3		2	2	3	4	1	2	2	2	2	3	3	
Woodpigeon	Green	No		2	5	3		4	4			2	3				2	1	3	
Wren	Green	No	2	1	1	3	3	2	2	1	2	2	2	1	1	1	3	2	2	3

## **4.0 CONCLUSION**

During the 2023 breeding season surveys vantage point were completed for the Project.

During the vantage point surveys a total of 63 flightlines were recorded comprising 6 no. target species. The activity recorded during the vantage point surveys was dominated by Buzzard and Kestrel both of which accounted for c. 80% of all flight activity recorded. Low levels of flight activity for Greater Black-Backed Gull, Grey Heron, Hen Harrier and Mallard were recorded.

A total of 3 red-listed species of high conservation concern (Kestrel, Meadow Pipit & Snipe) and 11 amber-listed species of amber conservation concern were recorded during the 2023 breeding season vantage point and transect surveys.

Hen Harrier was the only bird species that is listed on Annex 1 of the EC Birds Directive recorded during the vantage point surveys.





Carrigeen Renewable Energy  
Development

Bird Survey Report

2023/2024 Non-Breeding Season

Doherty Environmental Consultants Ltd.

March 2026

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

This report has been prepared by Doherty Environmental Consultants (DEC) Ltd with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for Carraigin Power Ltd. and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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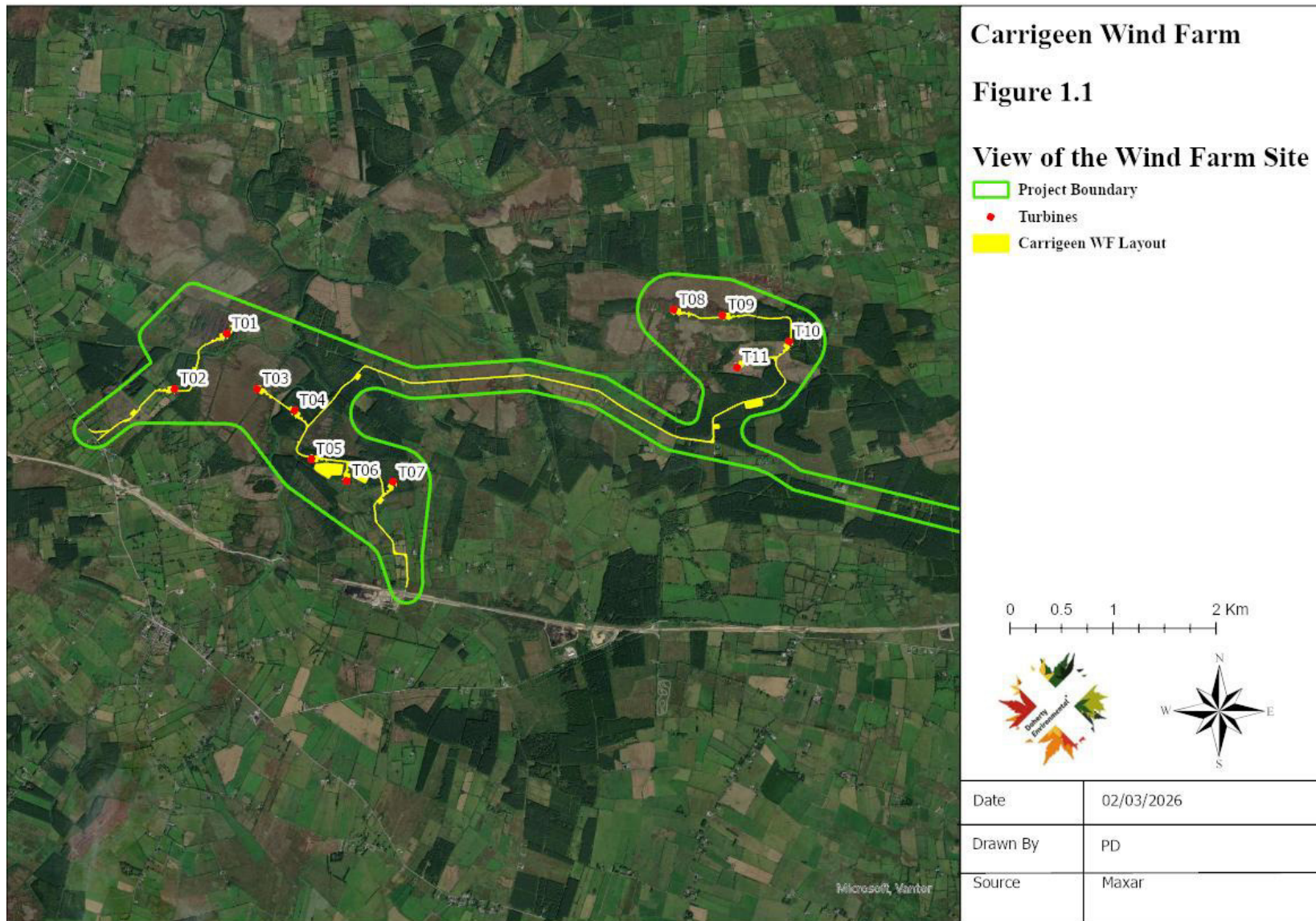
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## **1.0 INTRODUCTION**

Doherty Environmental Consultants (DEC) Ltd have been contracted to carry out ornithological surveys on behalf of Carraigin Power Ltd. for the proposed Carrigeen Renewable Energy Development, Co. Roscommon, which consists of a Wind Farm Site, a Grid Connection, and Turbine Delivery Route (altogether the Project). An aerial view of the Wind Farm Site is shown on Figure 1.1.

Surveys commenced at the proposed Wind Farm Site in late March 2022. This report provides details of the surveys completed during the 2023/2024 non-breeding season (October 2023 to March 2024). The 2023/2024 non-breeding season represents the second round of non-breeding season ornithological surveys completed for the proposed Project.

The surveys have been undertaken in order to provide a baseline environmental data set, which will be incorporated into the Environmental Impact Assessment (EIA) for the project as required under EU EIA Directive (Council Directive 2011/92/EU, amended in 2014/52/EU).



## 2.0 METHODOLOGY

### 2.1 VANTAGE POINT SURVEYS

The primary objective of the bird surveys completed for the proposed Project is to:

- Establish the presence and behaviour of raptors, waterbirds and other bird species known to be sensitive to collision with wind turbines over the Wind Farm Site;
- Obtain data on the movements of target species which would facilitate an analysis of foraging activity and collision risk;
- Identify any flight paths used by overwintering waterfowl.

The bird surveys involved vantage point surveys of the buildable area. The methodology adopted for the 2023/2024 non-breeding season vantage point surveys was derived from the Scottish Natural Heritage<sup>1</sup> (SNH) *Recommended bird survey methods to inform impact assessment of onshore wind farms* (2017). SNH guidance for surveys at wind farms recommend that field surveys focus on those species of high nature conservation value for which there is potential for impacts to occur. These target species in Ireland are derived from the following sources:

- Special conservation interest (SCI) bird species of the Special Protection Areas (SPAs) that occur within the zone of influence of a project; and
- those species that are of medium (amber) and high (red) conservation concern (i.e. Red Listed species).

Where species that are included under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;

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<sup>1</sup> Now known as Nature Scot.

- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >200m; 20m to 200m; and <20m<sup>2</sup>; and
- The behaviour of the target species.

SNH guidance (SNH, 2017) outlines specific survey methodologies for onshore wind farm developments. These guidelines recommend that vantage point surveys should be completed across all calendar months when the species is present or likely to be so.

Four vantage points (**VP1** to **VP4**) were used for monitoring of the proposed Wind Farm Site and surrounding area. The location of these vantage points are shown on **Figure 2.1**.

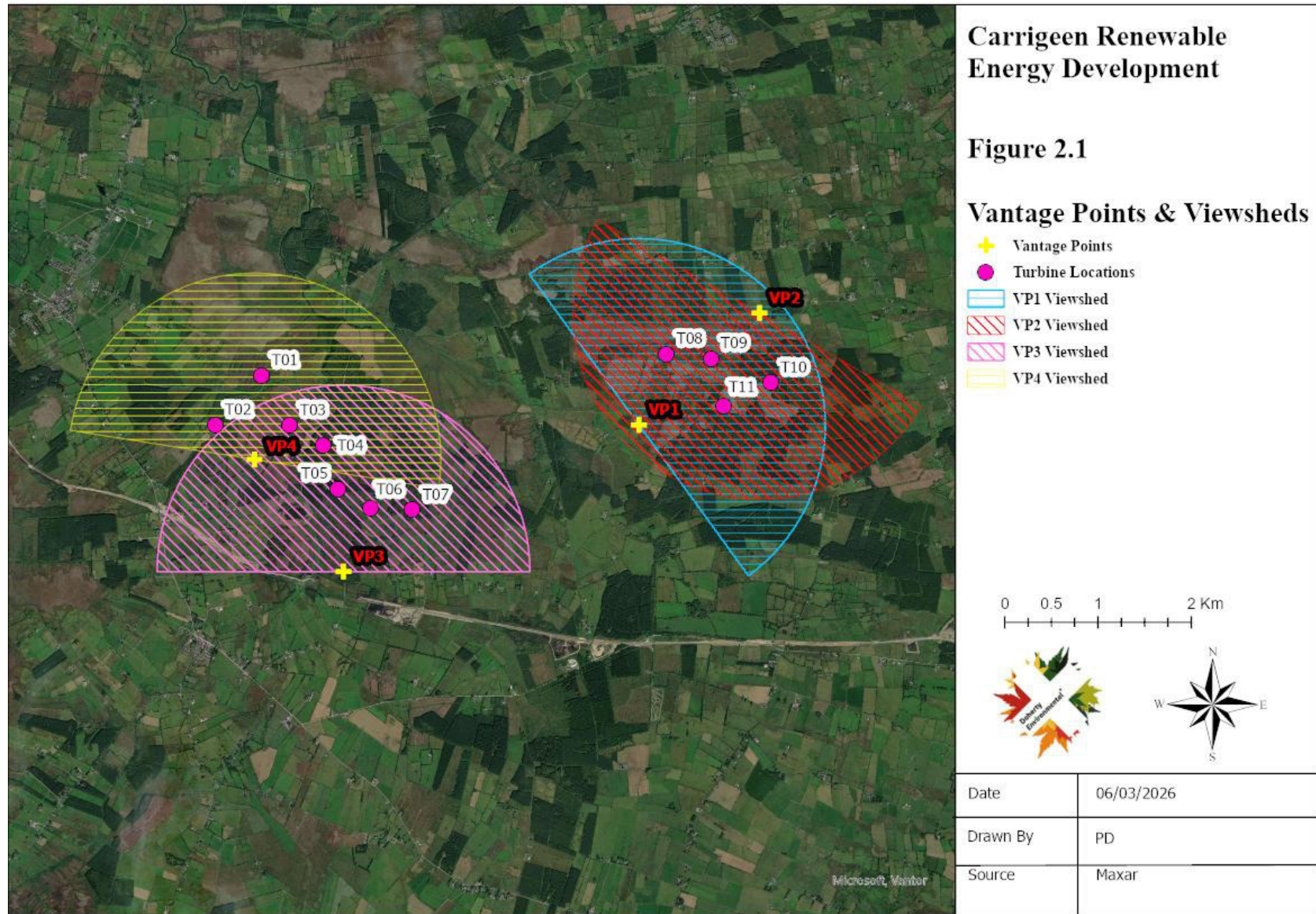
The vantage points were selected following a viewshed analysis of the proposed Wind Farm Site and a 500m buffer area surrounding the Wind Farm Site. The viewshed analysis was completed using QGIS software and is based on an observer height of 1.6m and an observable viewshed from the observer point at a height of 20m. The viewshed afforded from VP1 and VP4 is shown on **Figure 2.1**.

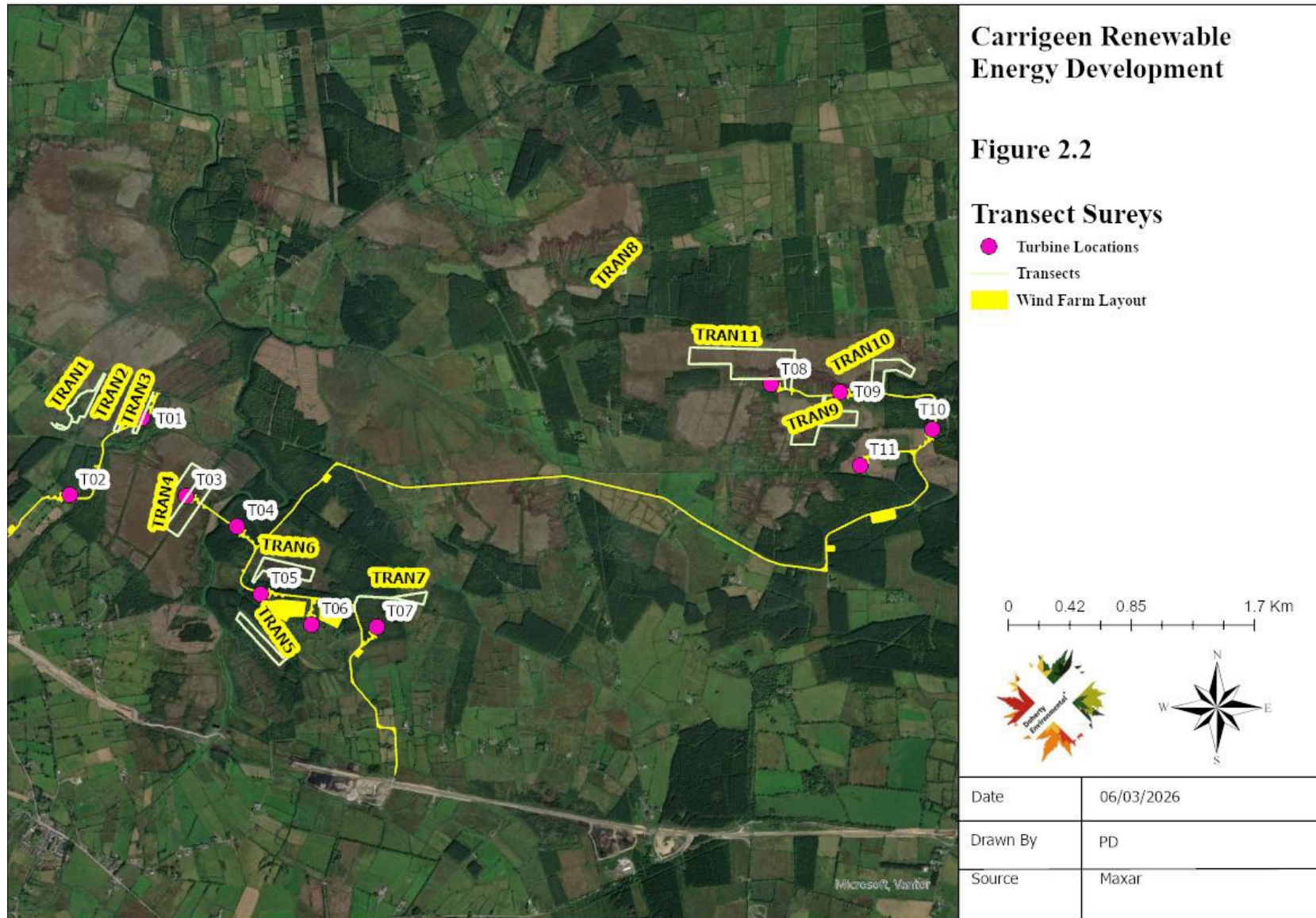
Surveys during the 2023/2024 non-breeding season commenced in October 2023 and continued monthly until March 2024.

A minimum of 36 hours surveying was completed at all vantage point locations during the non-breeding season between October 2023 and March 2024. The vantage point surveys were completed by undertaking two watches of a duration of 3 hours from each point per month.

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<sup>2</sup> The flight bands are based on the minimum and maximum height (i.e. 22m and 185m respectively) of the rotor blade sweep of typical commercial wind turbines.





## 2.2 NON-BREEDING SEASON TRANSECT SURVEYS

Non-breeding season transect surveys were completed to record the bird assemblages occurring at the proposed Wind Farm Site. A total of 11 no. transects were completed during the 2023/2024 non-breeding season. The location and extent of each transect is shown on **Figure 2.2**.

The methodology used was a combination of the Brown and Shepherd (1993), Moorland Bird Survey (MBS) and Common Bird Census techniques. Surveys were undertaken in suitable weather conditions, avoiding times of heavy and persistent rain and strong winds.

Each transect was walked at a steady slow walking speed and all birds seen and heard were recorded. Visual observations of birds were aided by the use of binoculars. The species and number of birds occurring along transects were recorded so that the species assemblage and associated abundance along each transect could be established.

## 2.3 HINTERLAND VANTAGE POINT SURVEYS

Hinterland surveys have been completed for 5 no. hinterland vantage point survey locations (HVP1; HVP2; HVP3; HVP4; and HVP5) in the wider area surrounding the Wind Farm Site. The location of the hinterland surveys and the associated viewshed are shown on **Figure 3.12**. The hinterland survey points were primarily used to survey for the presence of breeding and/or wintering raptors within the wider 2km area surrounding the proposed Wind Farm Site. The surveys were completed in accordance with Hardey et al. (2013). Activity associated with all other target species, as specified in Section 2.1 above was also recorded during the hinterland surveys. The data collection method during the hinterland surveys followed that described for the vantage point surveys at 2.1 above. During the non-breeding season the hinterland surveys were timed to coincide with twilight with surveys either commencing before first light or terminating after last light. The non-breeding season hinterland surveys were completed during these times to maximise the potential for identifying roost sites.

Each of the hinterland survey points were selected for the views afforded from these points providing coverage of semi-natural habitat with potential to function as roost or breeding sites for raptors as well as the expansive coverage of the surrounding area:

- HVP 1 is located to the west of the Wind Farm Site and provides a view over an expanse of wetland habitat occurring to the west of the Wind Farm Site.
- HVP2 is located to the north of the proposed Wind Farm Site and provides a view looking south toward the Wind Farm Site over areas of wetland habitat.
- HVP3 is located to the east of the Wind Farm Site and provides an expansive view looking west over the Wind Farm Site.
- HVP4 is located to the south of the Wind Farm Site and provides an expansive view looking north towards the Wind Farm Site over unimproved wet grassland fields.
- HVP5 is located to the southwest of the Wind Farm Site and provides a view over the northern area over Bellanagare Bog SPA.

## 2.4 HEN HARRIER ROOSTING ACTIVITY SURVEY

Hen Harrier winter roost surveys were completed for areas of suitable roost habitat within the 2km buffer area of the Wind Farm Site. The non-breeding season vantage point surveys and the hinterland vantage point surveys were both timed to target observations of Hen Harrier roosting activity within the Wind Farm Site and immediate surrounding area and in the wider 2km surrounding area. The Hen Harrier winter roost surveys were completed in addition to these surveys and targeted specific areas of suitable Hen Harrier roosting habitat in the vicinity of the Wind Farm Site. Three no. Hen Harrier winter roost vantage points (HHVP1 to HHVP3) were completed. The location of these vantage points are shown on **Figure 3.13**. HHVP1 provided targeted survey of the Cloonashanville Bog to the north of the Wind Farm Site; HHVP2 provided targeted survey of the remnant raised bog habitat located between the western and eastern wind farm parcels; and HHVP3 provided targeted survey of degraded raised bog and wetland habitat to the southeast of the eastern wind farm parcel.

## 3.0 RESULTS

### 3.1 VANTAGE POINT

A total of 36 hours of vantage point watching was completed from each vantage point VP1 to VP4 during the October to March vantage point surveys.

A total of 10 target species were recorded during the 2023-2024 non-breeding season vantage point surveys. These species (BTO Code in parenthesis) and their current conservation status are as follows:

**Buzzard (BZ):** conservation status = Green Low conservation concern

**Cormorant (CA):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Grey Heron (H.):** conservation status = Green Low conservation concern

**Hen Harrier (HH):** conservation status = Amber (Breeding) Medium conservation concern

**Kestrel (K.):** conservation status = Red (Breeding) High conservation concern

**Lesser Black-Backed Gull (LB):** conservation status - Amber (Breeding and Wintering) Medium conservation concern

**Mallard (MA):** conservation status = Green Low conservation concern

**Sparrowhawk (SH):** conservation status = Green Low conservation concern

**Teal (T.):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Whooper Swan (Whooper Swan):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

Of the bird species recorded only Hen Harrier and Whooper Swan are listed on Annex 1 of the EC Birds Directive.

A total of 55 flights by target species were recorded during the non-breeding season. **Figure 3.1** shows all flights observed during the vantage point surveys. The percentage breakdown of flights recorded per species are set out in Table 3.1 below.

**Table 3.1: Vantage Point Flight lines recorded during the 2023/2024 Non-Breeding season**

Species	No. Flights	Percentage Flights
Buzzard	13	24%
Cormorant	2	4%
Grey Heron	8	15%
Hen Harrier	2	4%
Kestrel	14	25%
Lesser Black-backed Gull	2	4%
Mallard	9	16%
Sparrowhawk	3	5%
Teal	1	2%
Whooper Swan	1	2%

A summary of the observations for each target species is provided in the following subsections.

### **3.1.1 Buzzard**

Buzzard along with Kestrel was the most frequently observed species during the 2023/2024 non-breeding season vantage point surveys. A total of 13 Buzzard flights were observed during the non-breeding season. The number of birds recorded during individual flight observations was dominated by single bird flights (8 of 13). One flight of 3 no. and 4 no. birds respectively were recorded with the remainder being of pairs of birds in flight. This species was typically recorded flying within the <20m and 20 to 200m height band, with a lower number of flights being recorded at higher elevation >200m.

The range of activity recorded during flights included hunting, commuting, soaring, being mobbed by hooded crows; landing to perch on trees.

**Figure 3.2** shows all Buzzard flights observed during the 2023-2024 non-breeding season.

### **3.1.2 Cormorant**

Two brief Cormorant flight was observed from VP3 and VP4 during the 2023-2024 non-breeding season. The bird was seen flying at heights less 100m for less than 60 and 75 seconds.

**Figure 3.3** shows the Cormorant flights observed during the 2023-2024 non-breeding season.

### **3.1.3 Grey Heron**

A total of 8 Grey Heron flights were observed during the 2023-2024 non-breeding season. All flights were observed flying low at <50m for short durations (<45 seconds). All flights observed were of individual herons.

**Figure 3.4** shows the Grey Heron flights observed during the 2023-2024 non-breeding season.

### **3.1.4 Hen Harrier**

Two no. daytime Hen Harrier flights were observed during the 2023-2024 non-breeding season, comprising one ringtail and one male flight during December (at 11:17) and January (at 15:43) respectively. The flights were representative of foraging bouts at low altitude close to the ground. The flights were observed for short durations at less than 60 seconds.

**Figure 3.5** shows the Hen Harrier flights observed during the 2023-2024 non-breeding season.

### **3.1.5 Kestrel**

Kestrel was the most frequently recorded species during the 2023-2024 non-breeding season with a total of 14 flights observed. All observations were of an individual kestrel. The majority of the Kestrel flights were observed at low height at <50m. All flights were of short duration at <45 seconds.

**Figure 3.6** shows all Kestrel flights observed during the 2023-2024 non-breeding season.

### **3.1.6 Lesser Black-backed Gull**

Two no. Lesser Black-backed Gull flights were observed during the 2023-2024 non-breeding season. Both were of a pair of birds commuting at height (>100m). The flights were observed for short durations at less than 60 seconds. Both flights were observed for c. 50 seconds and 105 seconds respectively as the gulls flew through the study area.

**Figure 3.7** shows the Lesser Black-backed Gull flights observed during the 2023-2024 non-breeding season.

### **3.1.7 Mallard**

A total of 9 no. Mallard flights were recorded during the non-breeding season. Flights were recorded at low height at <40m (4 of 9) and less than 100m (5 of 9) with all flights being of a duration of 15 seconds to 60 seconds. Five of the flights were of a pair of Mallard whilst the remaining 4 were of individual Mallard in flight.

**Figure 3.8** shows the Mallard flights observed during the 2023-2024 non-breeding season.

### **3.1.8 Sparrowhawk**

Three flights of a Sparrowhawk were recorded during the 2023-2024 non-breeding season. These flights were recorded low over the ground at <20m and were of short duration at less than c. 30 seconds.

**Figure 3.9** shows the Sparrowhawk flights observed during the 2023-2024 non-breeding season.

### **3.1.9 Teal**

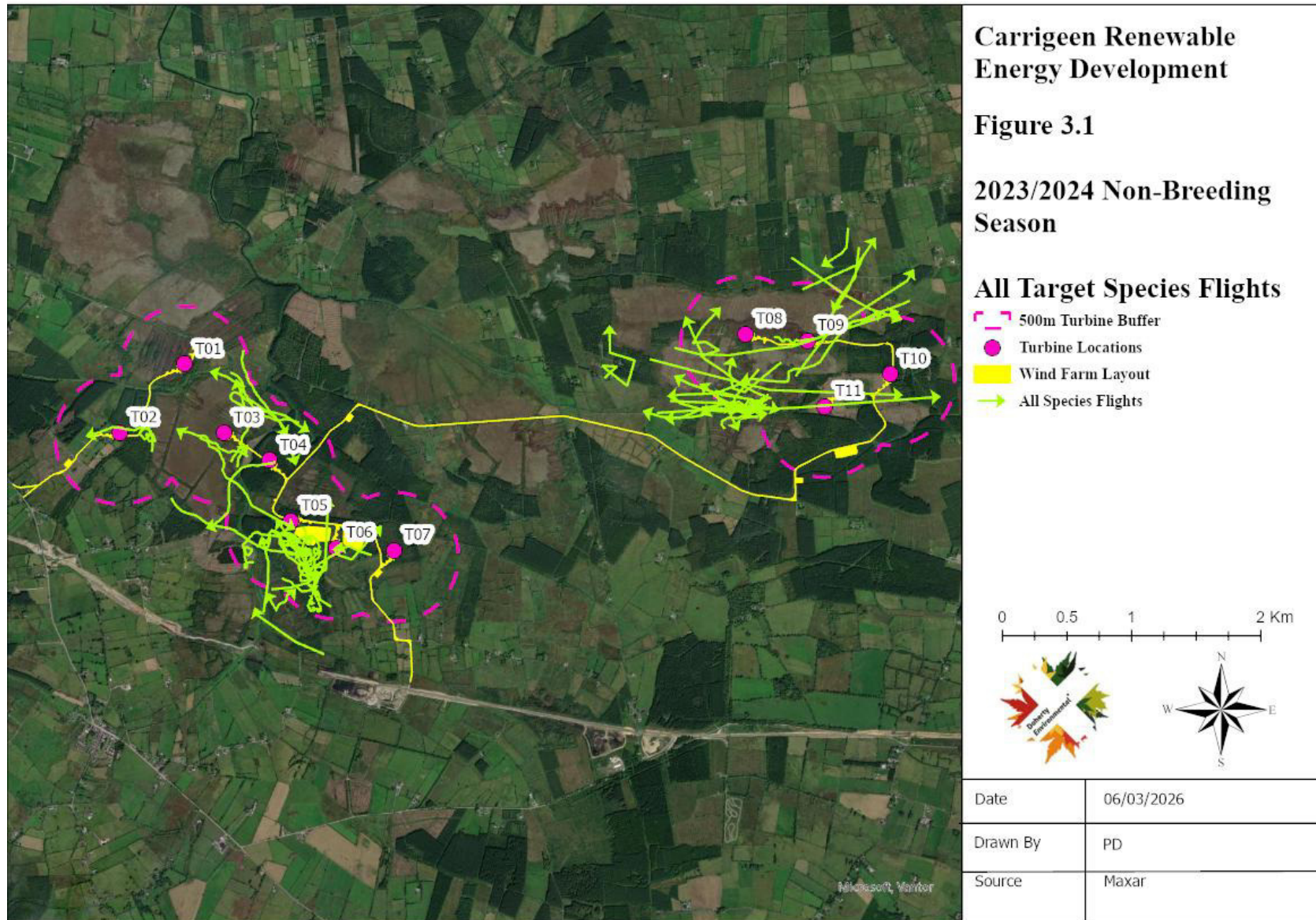
One flight of a pair of Teal was recorded during the 2023-2024 non-breeding season. This flight was recorded low over the ground at <40m and was of a short duration at less than c. 30 seconds.

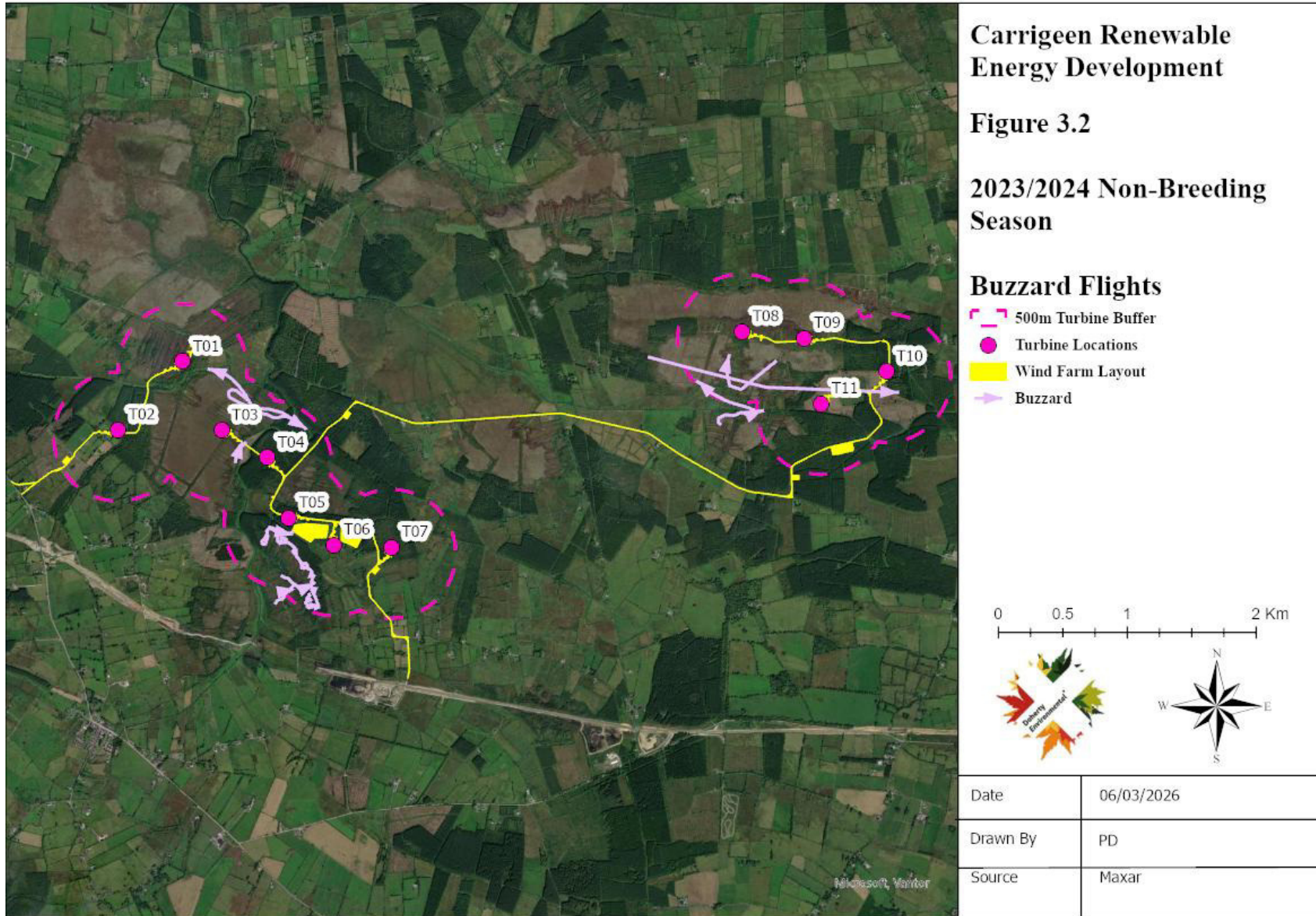
**Figure 3.10** shows the Teal flight observed during the 2023-2024 non-breeding season.

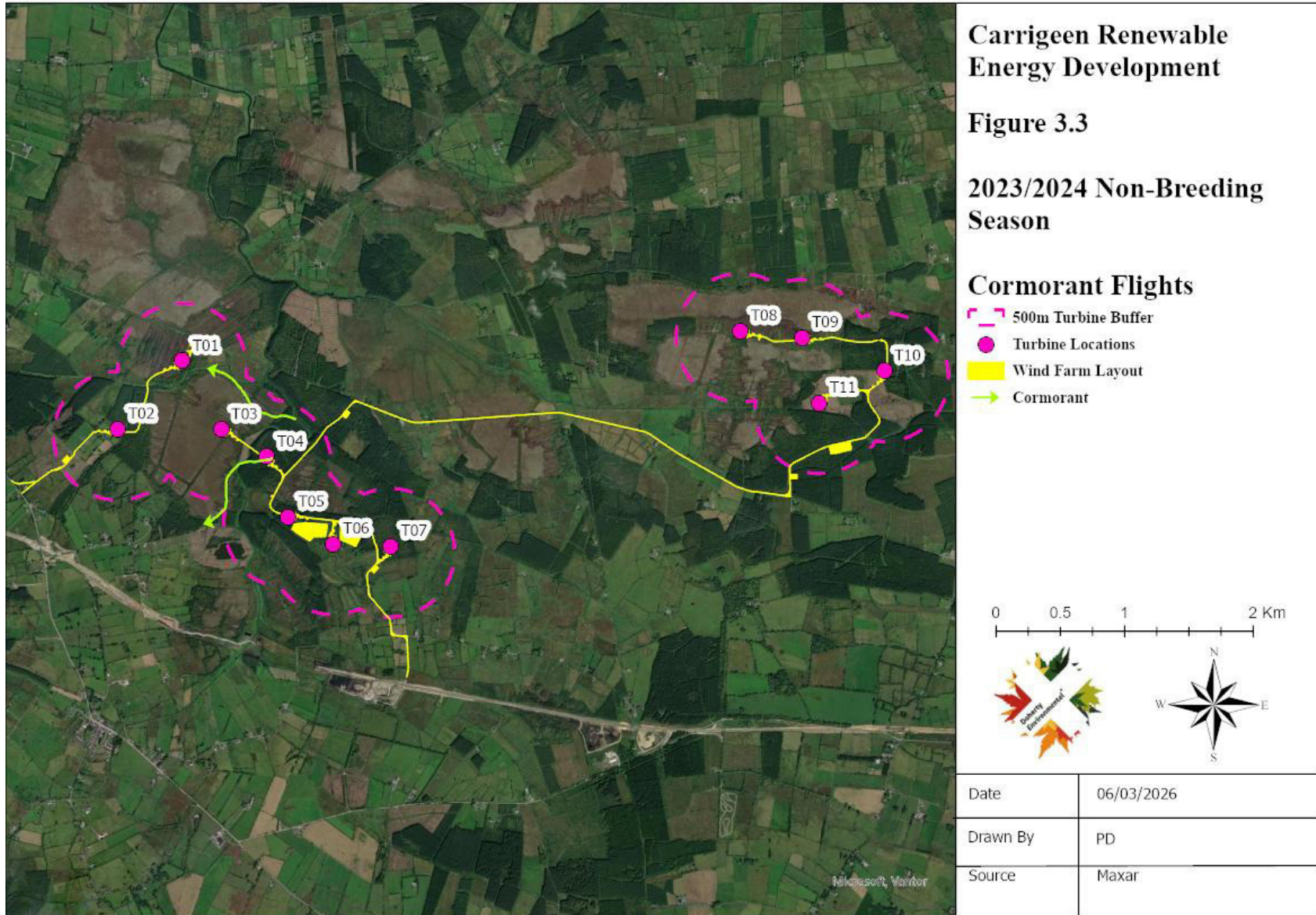
### **3.1.10 Whooper Swan**

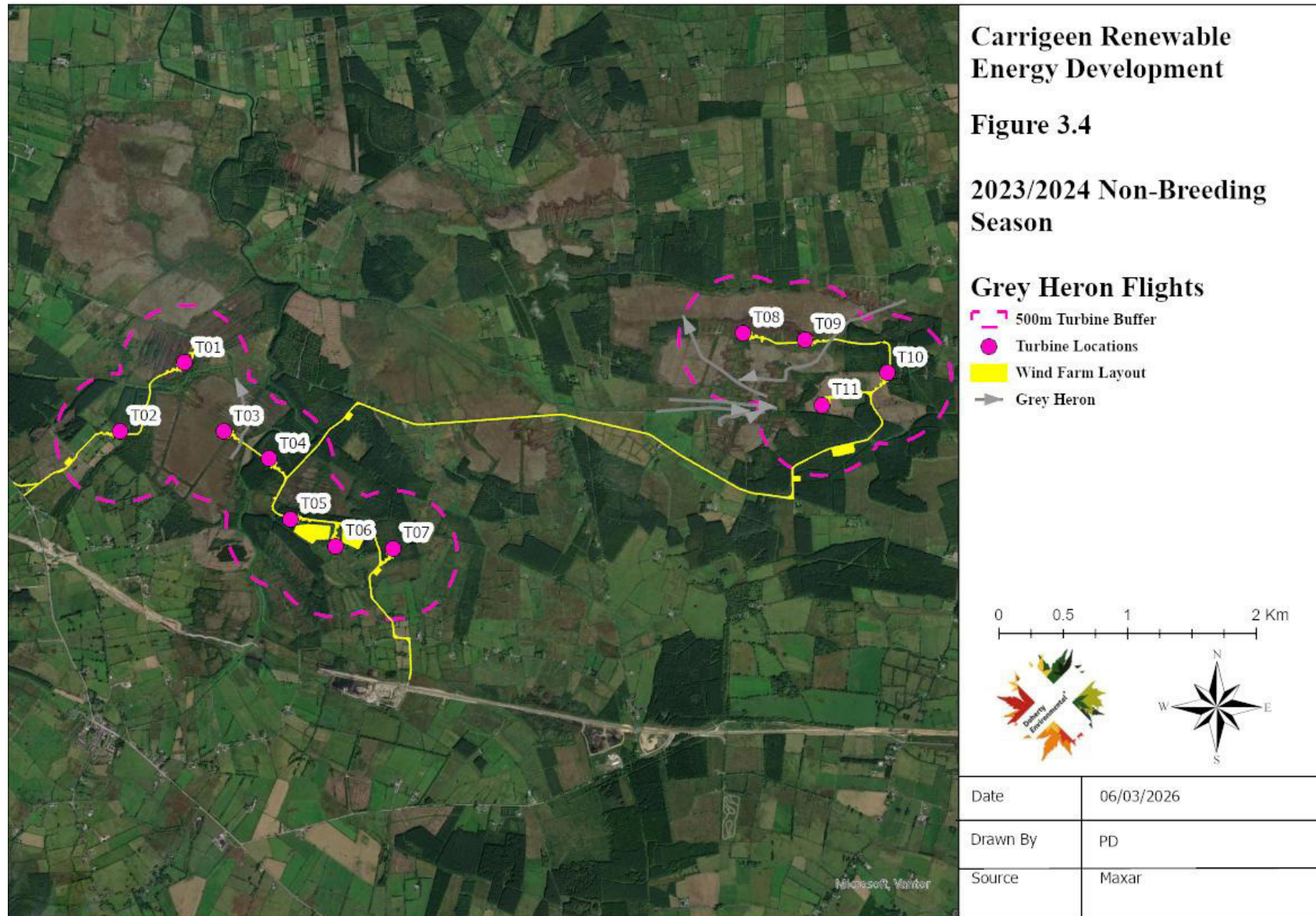
One flight of a pair of Whooper Swan was recorded during the 2023-2024 non-breeding season. This was of a pair of birds commuting low of conifer plantation in the eastern wind farm parcel. The pair were observed for c. 30 seconds flying at a height of c. 30m over plantation.

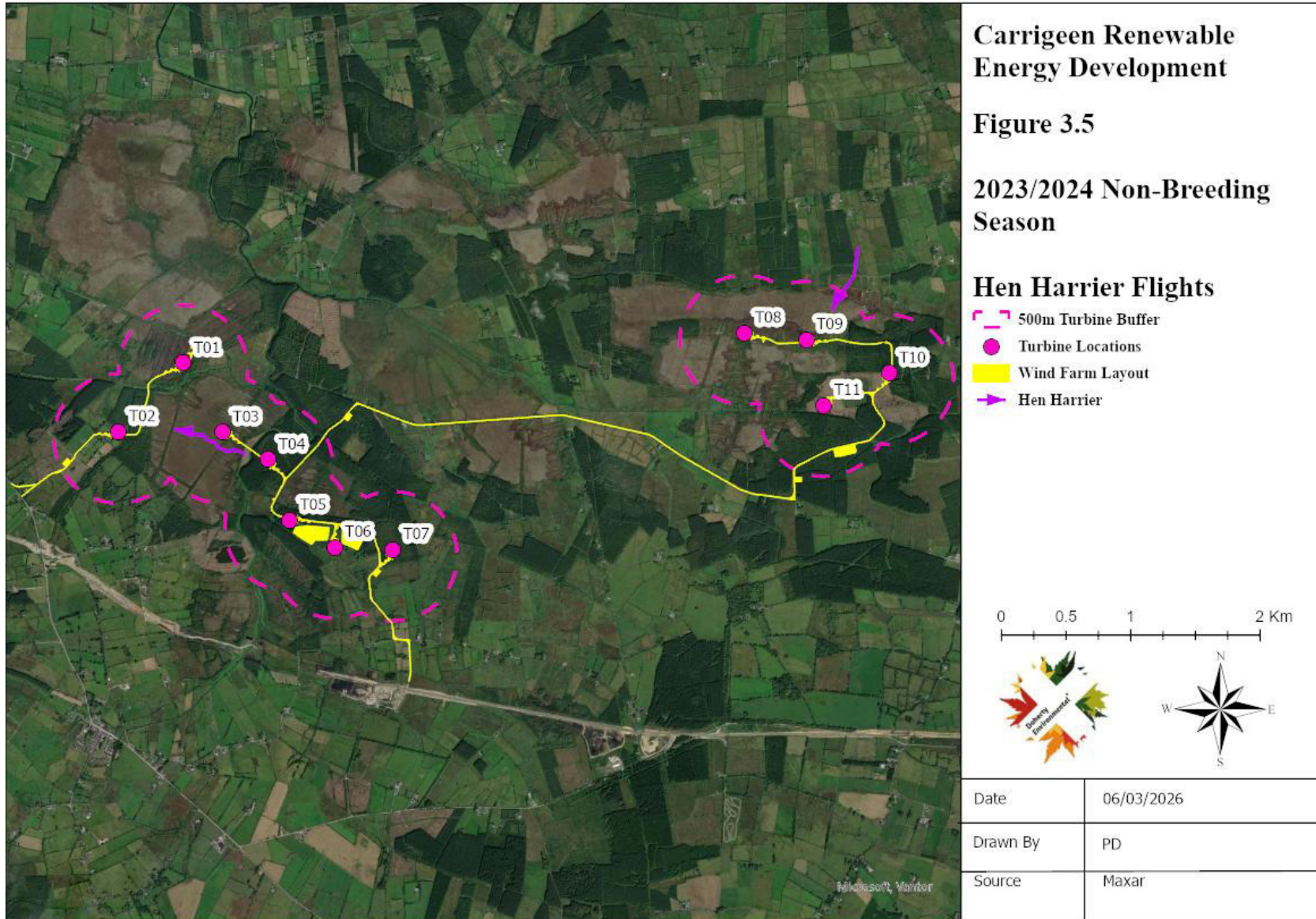
**Figure 3.11** shows the Whooper Swan flight observed during the 2023-2024 non-breeding season.

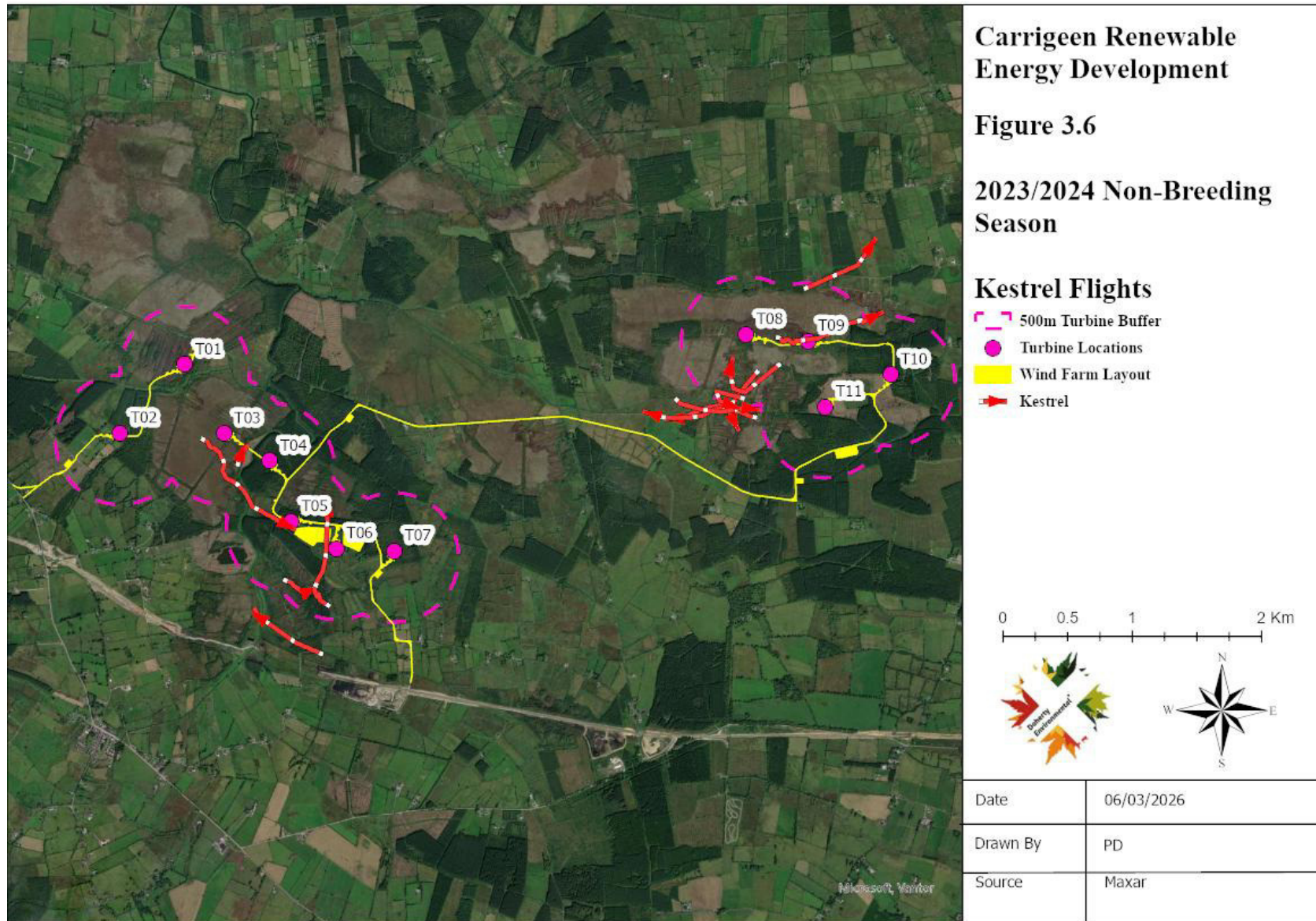


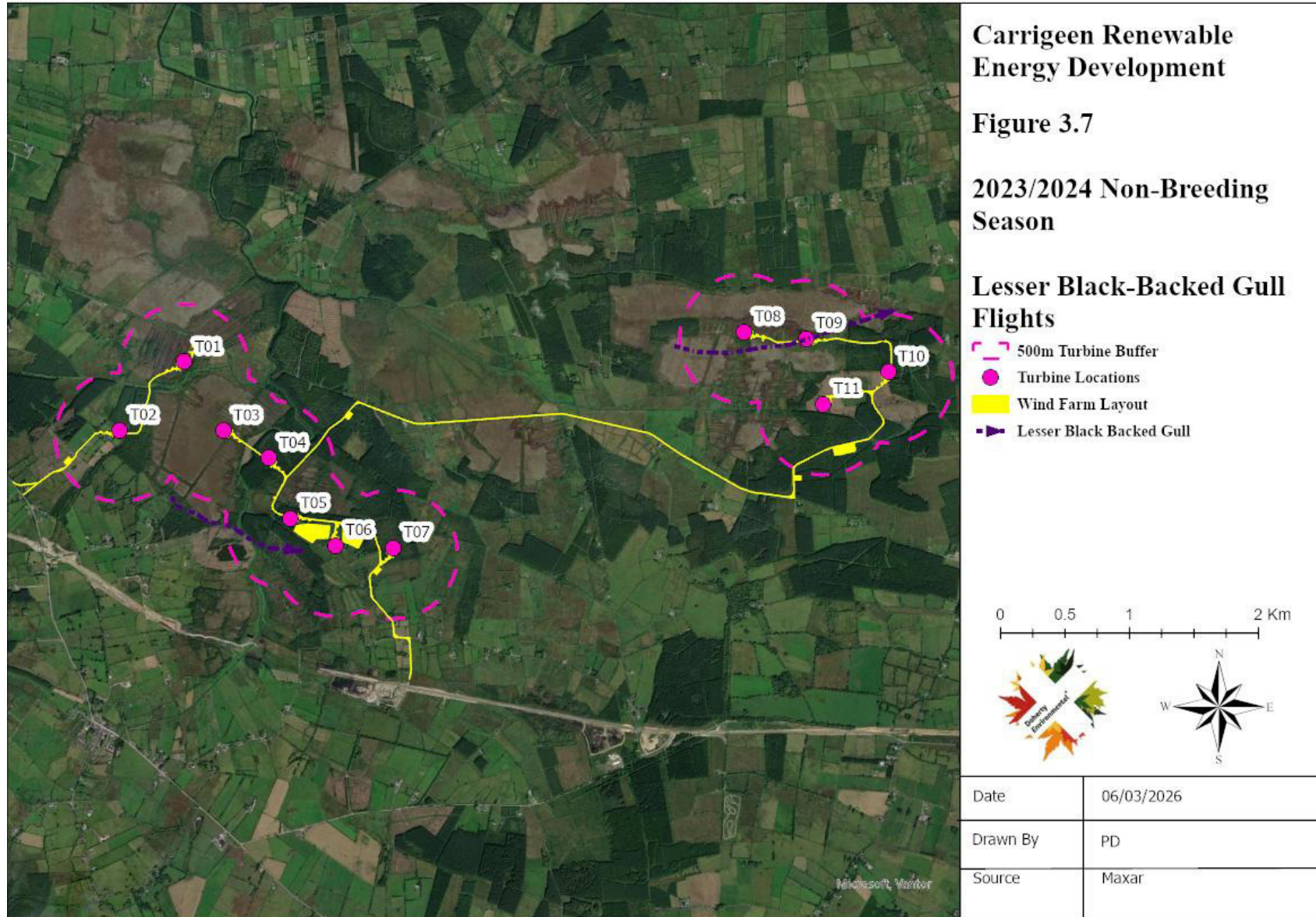


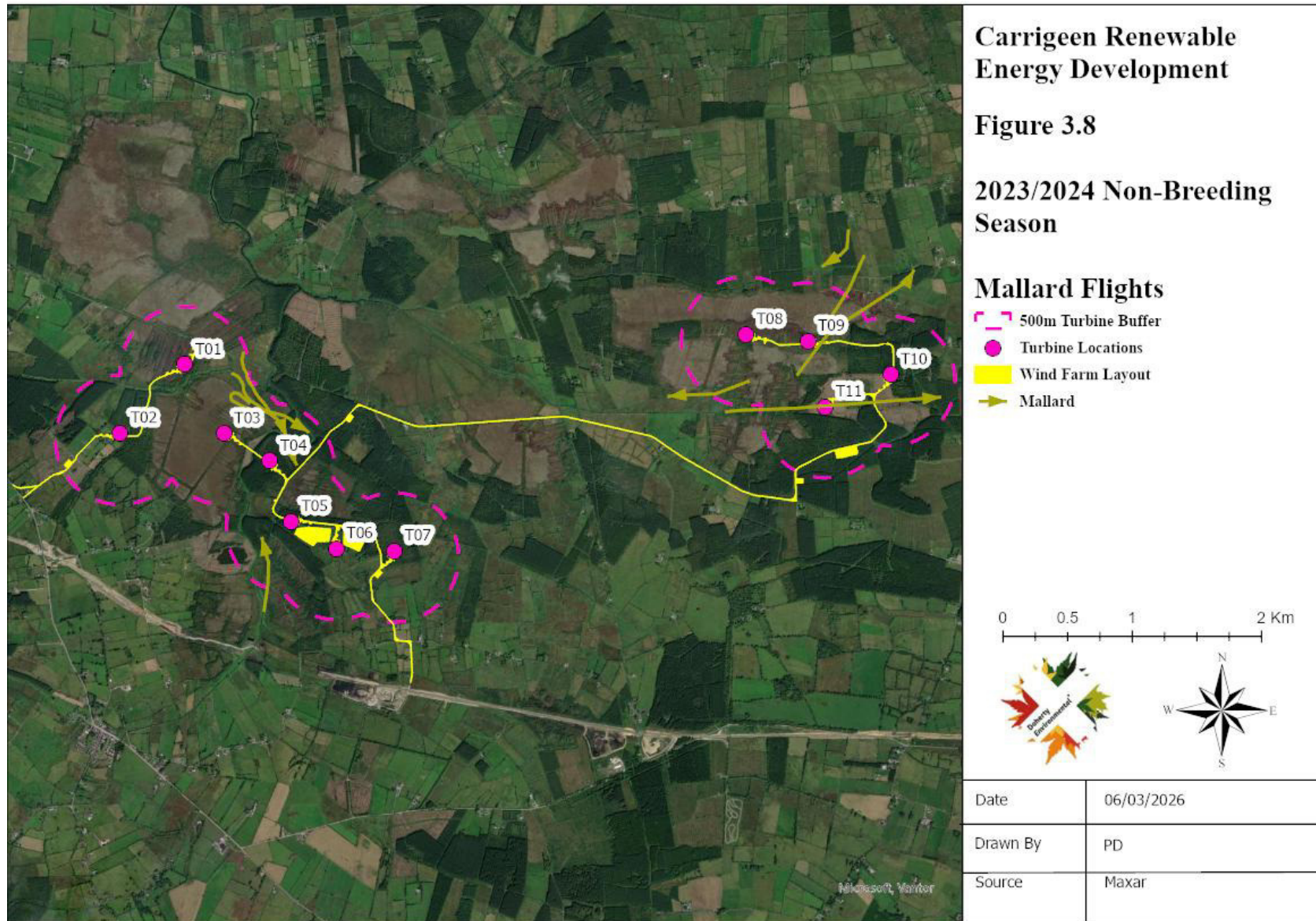


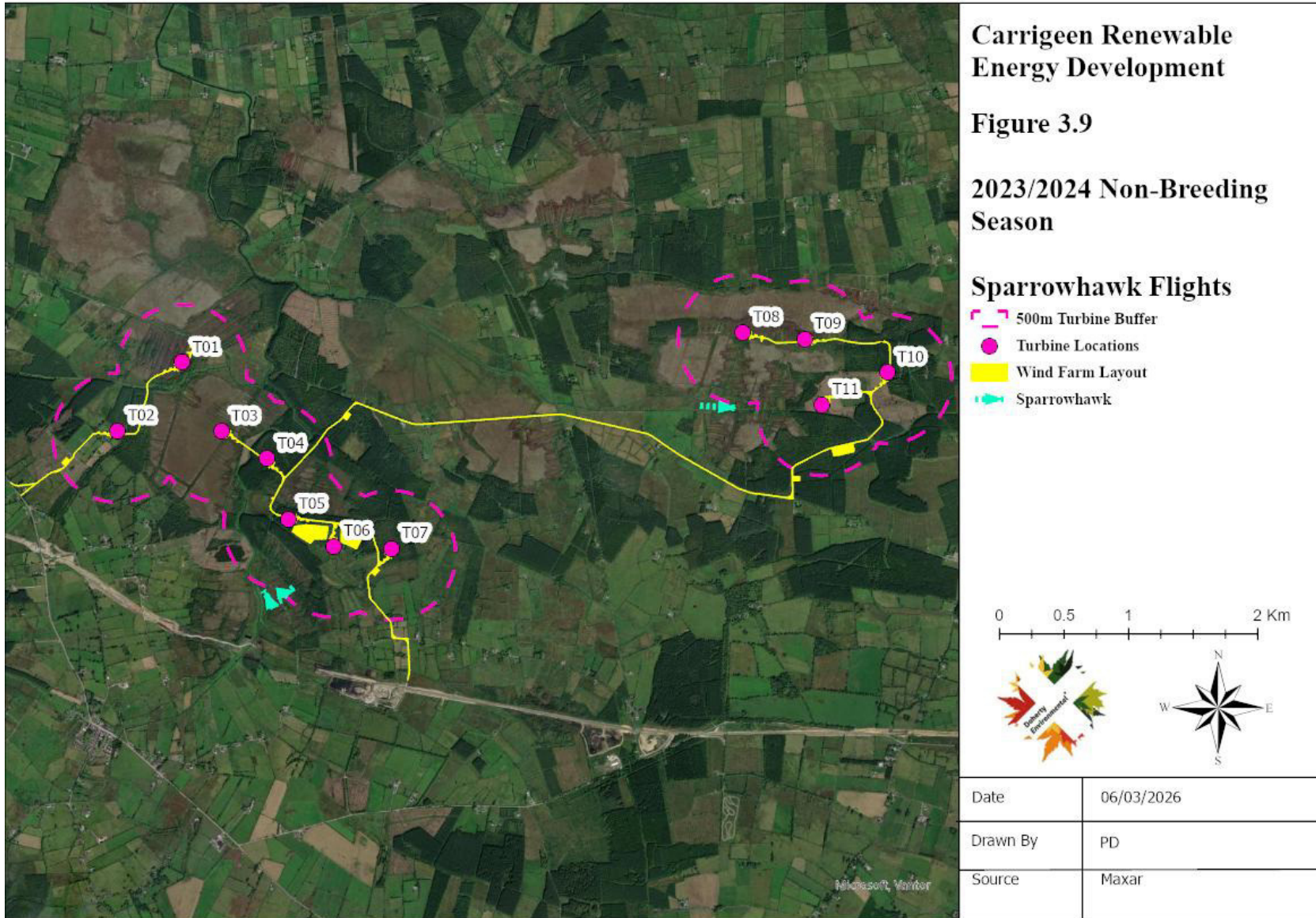


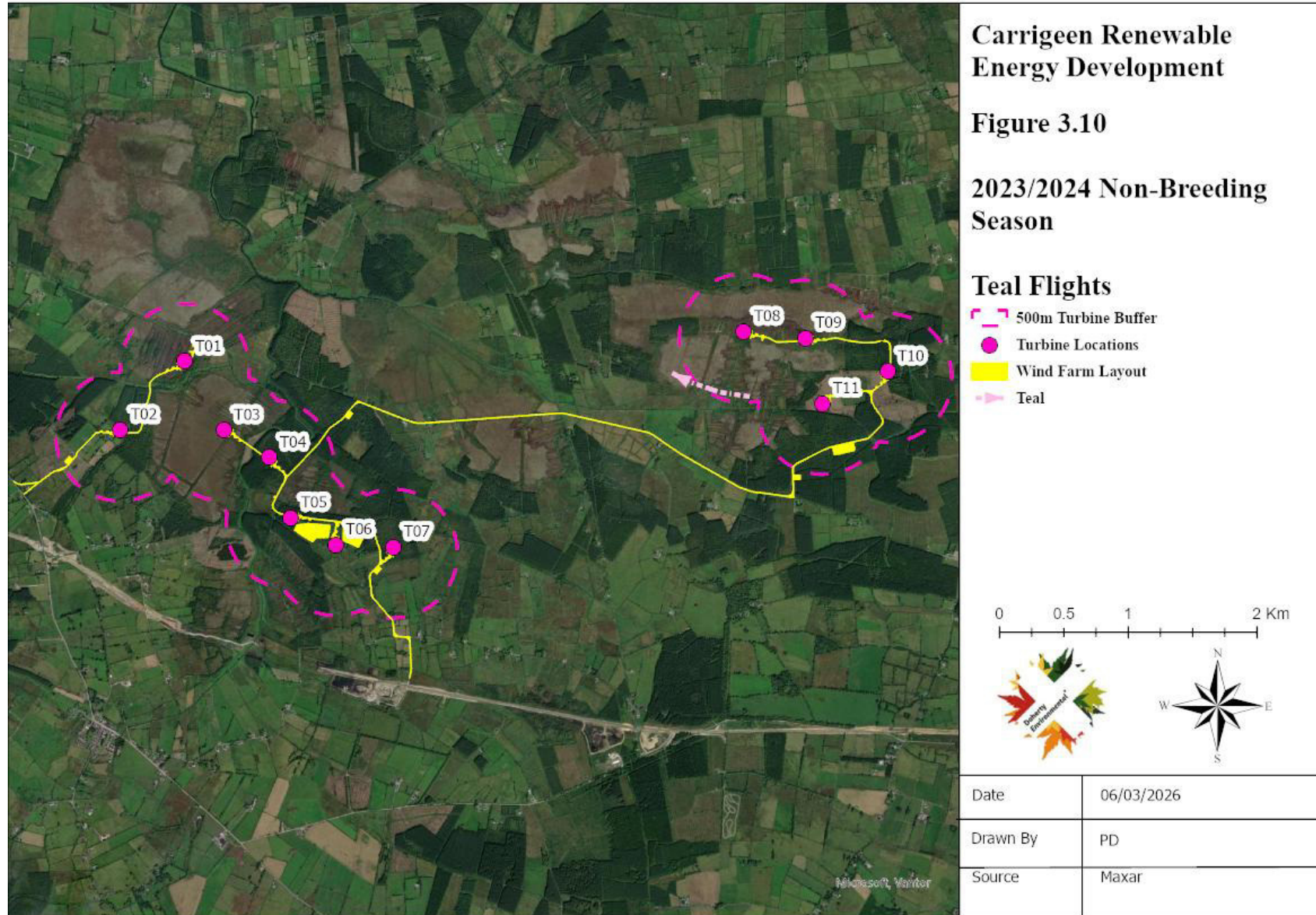


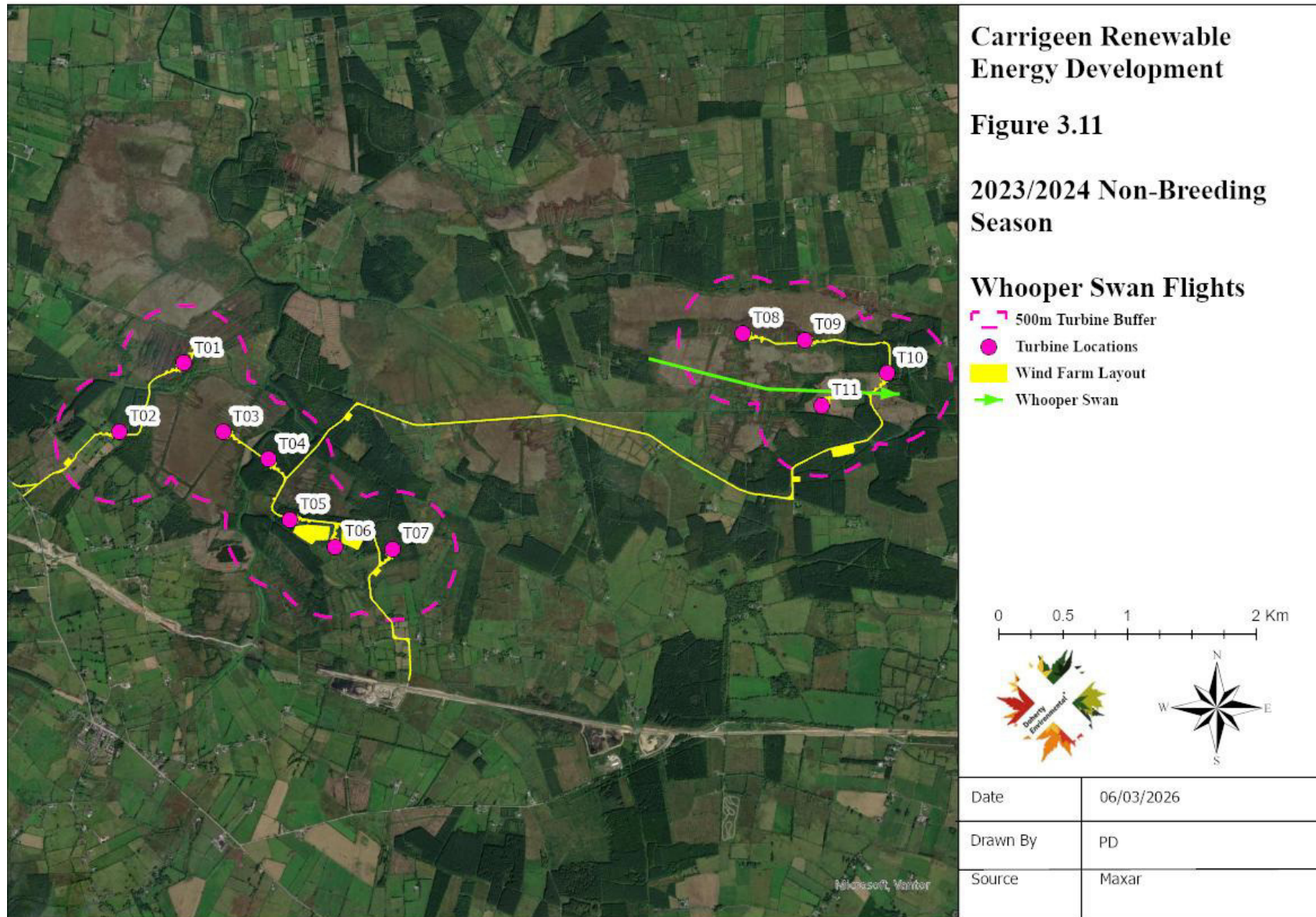












### 3.2 TRANSECT SURVEYS

The results of the transect surveys completed between October 2023 and March 2024 are provided in Table 3.2 below. A total of 46 species were recorded during the non-breeding season transect surveys. The majority of the species recorded are of low conservation concern (Green-listed species). Nine species of medium conservation concern (Amber-listed species) were recorded. These are Goldcrest, Greenfinch, House Sparrow, Linnet, Mallard, Skylark, Starling, Swallow and Willow Warbler. Four species of high conservation concern (Red-Listed Species), namely Kestrel, Meadow Pipit, Red Wing and Snipe were recorded during the survey. Kestrel was recorded along transect 7. Meadow Pipit was recorded from all transects with the exception of Transect 2; 3; 7; and 8. Redwing was observed along transect T1 and T7. Snipe was recorded along Transect 1; 3; 4; 6; 7; 9; 10 and 11.

**Table 3.2: Transect Survey Results**

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	26/10	11/01	08/02
Blackbird	Green	No				2	2	3	2	2	3					1	2			
Blackcap	Green	No																		
Blue Tit	Green	No				1	2	2	1	2	2					1				
Bullfinch	Green	No																		
Buzzard	Green	No																		
Chaffinch	Green	No				4	3	3	4	3	3				4	3				
Chiffchaff	Green	No																		
Coal Tit	Green	No				2	3		2	3					1		1			
Crossbill	Green	No															12			
Cuckoo	Green	No																		
Duncock	Green	No				1	2		1	2										
Fieldfare	Green	No	10	8		14				6										
Goldcrest	Amber	No													2	1	2			
Goldfinch	Green	No					14		3		8									
Great Tit	Green	No				2	2	2	2	2	2				1	1	2	2	2	
Greenfinch	Amber	No					1			1										
Grey Heron	Green	No																		
Hen Harrier	Amber	Yes																		
Hooded Crow	Green	No				2			2									5	1	
House Martin	Amber	No																		
House Sparrow	Amber	No																		
Jay	Green	No		1											1					1

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	26/10	11/01	08/02
Jackdaw	Green	No				1	1		1	1										
Kestrel	Red	No																		
Lesser Black-backed Gull	Amber	No	1																	
Lesser Redpoll	Green	No				1			1								1	1		
Linnet	Amber	No		2		1		1	1		1						1	1		
Long-tailed Tit	Green	No															1			
Magpie	Green	No		3																
Mallard	Amber	No				2		1	2		1									
Meadow Pipit	Red	No	1		1							1	2	1	1	1	2	1		
Mistle Thrush	Green	No																		
Pheasant	Green	No					1			1										
Pied Wagtail	Green	No		1		1	2	2	1	2	2		1		1					
Raven	Green	No			1															
Red Wing	Red	No	12	6		8														
Reed Bunting	Green	No																		
Robin	Green	No		2	4	2		2	2		2	1		1	1	2	2	2	2	
Rook	Green	No		4	12		6		4	2								6		
Siskin	Green	No		1								1	1	1						
Skylark	Amber	No	2	6		1			2	2	2	3	8	1	1	2				
Snipe	Red	No	1	2						1		3	4	8			1	1	4	
Song Thrush	Green	No	1				1						1							
Sparrowhawk	Green	No	1						11											
Starling	Amber	No		5	6	11			1	2							14	2		
Stonechat	Green	No		2		1	2		1								1	2	2	
Swallow	Amber	No																		
Teal	Amber	No																		

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	25/10	30/01	07/02	26/10	11/01	08/02
Treecreeper	Green	No																		
Whitethroat	Green	No																		
Willow Warbler	Amber	No							3	5	2									
Woodpigeon	Green	No		7		3	5	2	2	2	2	3			5			1	3	1
Wren	Green	No	1			1	2	2		1	1				2	3	1	2		1

Species	BoCCI	Annex 1	Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			26/10	11/01	08/02	26/10	11/01	08/02	09/10	07/12	13/02	09/10	07/12	13/02	09/10	07/12	13/02
Blackbird	Green	No												1	1	1	1
Blackcap	Green	No															
Blue Tit	Green	No		1													
Bullfinch	Green	No						1		2							
Buzzard	Green	No	1				1										
Chaffinch	Green	No	1	2	3	3	4		1						3	3	1
Chiffchaff	Green	No							2	4	1						
Coal Tit	Green	No		2	2										2		3
Crossbill	Green	No			10				1	1							
Cuckoo	Green	No															
Dunnock	Green	No	1														
Fieldfare	Green	No	24	16													
Goldcrest	Amber	No	6		6												
Goldfinch	Green	No			18					1	1						
Great Tit	Green	No	1	1			1					2		1		2	1
Greenfinch	Amber	No								1	1						
Grey Heron	Green	No															
Hen Harrier	Amber	Yes															
Hooded Crow	Green	No	5	2	2	4				3		3	3	2	3	3	1
House Martin	Amber	No															
House Sparrow	Amber	No					2										
Jay	Green	No		1													
Jackdaw	Green	No		4	12					6					6	3	
Kestrel	Red	No			1												
Lesser Black-backed Gull	Amber	No															
Lesser Redpoll	Green	No	1							1	1				2	3	

Species	BoCCI	Annex 1	Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			26/10	11/01	08/02	26/10	11/01	08/02	09/10	07/12	13/02	09/10	07/12	13/02	09/10	07/12	13/02
Linnet	Amber	No								1							
Long-tailed Tit	Green	No	10	5		10	4		5								
Magpie	Green	No		1										1			
Mallard	Amber	No															
Meadow Pipit	Red	No						1	2	3	4	2	2	1			
Mistle Thrush	Green	No			2												
Pheasant	Green	No	1					1									
Pied Wagtail	Green	No		1										2		2	
Raven	Green	No				1					2						
Red Wing	Red	No	20	12													
Reed Bunting	Green	No															
Robin	Green	No	1	1		3	1	1	2	4	3			2	2		
Rook	Green	No							3	2	2						
Siskin	Green	No		1								1					
Skylark	Amber	No							4	3	1	2					
Snipe	Red	No	1	2					4	2	2	2	2	2	8	5	
Song Thrush	Green	No															
Sparrowhawk	Green	No															
Starling	Amber	No						7									
Stonechat	Green	No		1			1								2		
Swallow	Amber	No															
Teal	Amber	No															
Treecreeper	Green	No															
Whitethroat	Green	No				1											
Willow Warbler	Amber	No							1	1		1	1				
Woodpigeon	Green	No	4	3		2	4		1	2	3						

Species	BoCCI	Annex 1	Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			26/10	11/01	08/02	26/10	11/01	08/02	09/10	07/12	13/02	09/10	07/12	13/02	09/10	07/12	13/02
Wren	Green	No	3	1	1	1	1		2	3	2		3		4	2	5

### 3.3 HINTERLAND VANTAGE POINT SURVEYS

A total of seven no. species and 17 no. flight observations were recorded during the 2023-2024 non-breeding season hinterland vantage point surveys. These comprise Buzzard, Grey Heron, Kestrel, Lesser Black-backed Gull, Mallard, Sparrowhawk and Teal. The flights observed were comprised of the follows:

Five no. flights of individual Buzzard from HVP2, 3, 4 and 5;

One no. Grey Heron flight was recorded during a hinterland vantage point watch at HVP5 during November;

Four no. Kestrel flights were recorded from HVP 1, 3, 4 and 5;

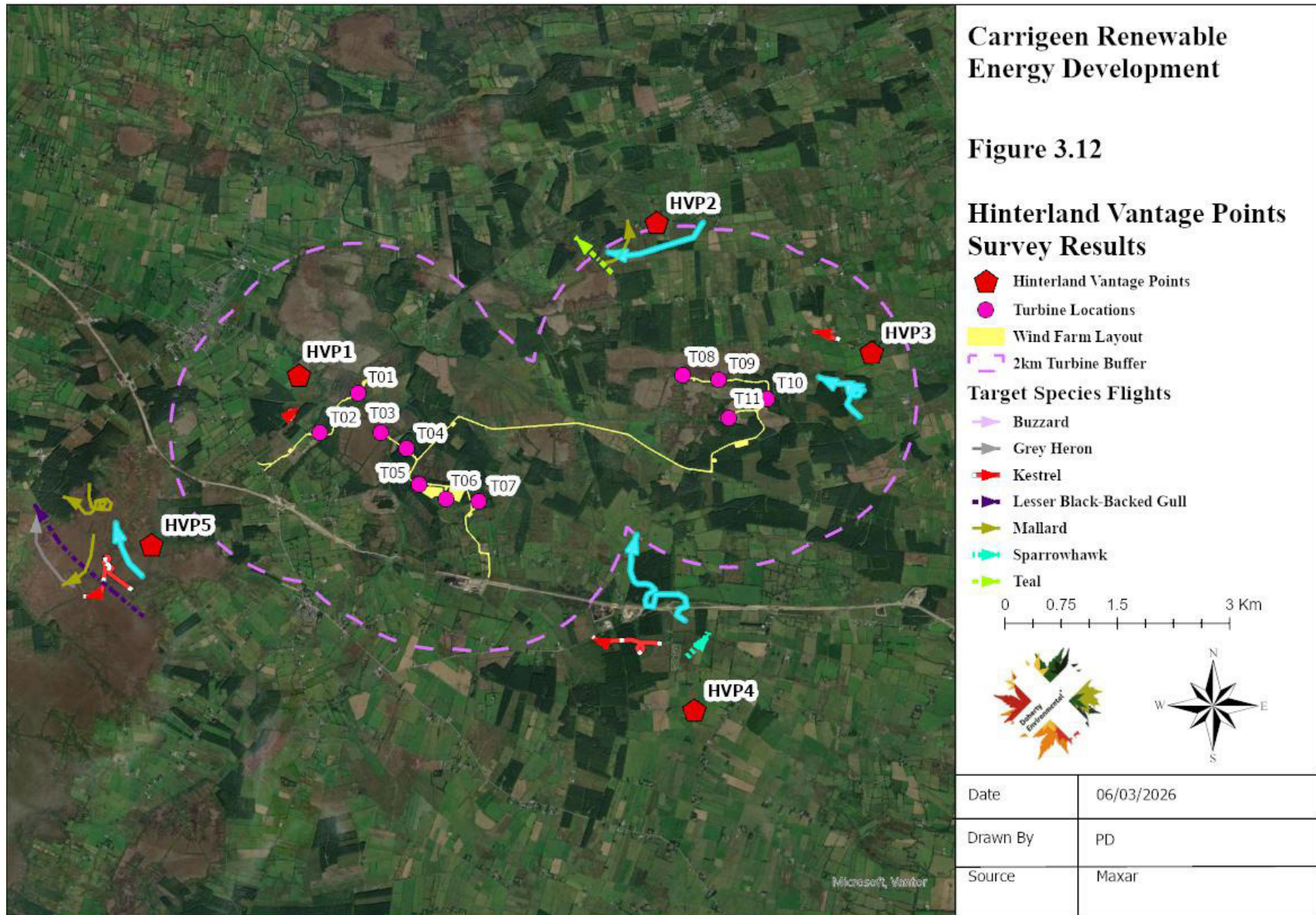
One no. flight of a commuting individual Lesser Black-Backed Gull was observed from HVP5.

Three no. Mallard flights were recorded from HVP2 and 5. One of the flights observed from HVP2 was of a pair of Mallard;

One no. Sparrowhawk flight were recorded from HVP4; and

One no. flight of a pair of Teal was recorded from HVP2.

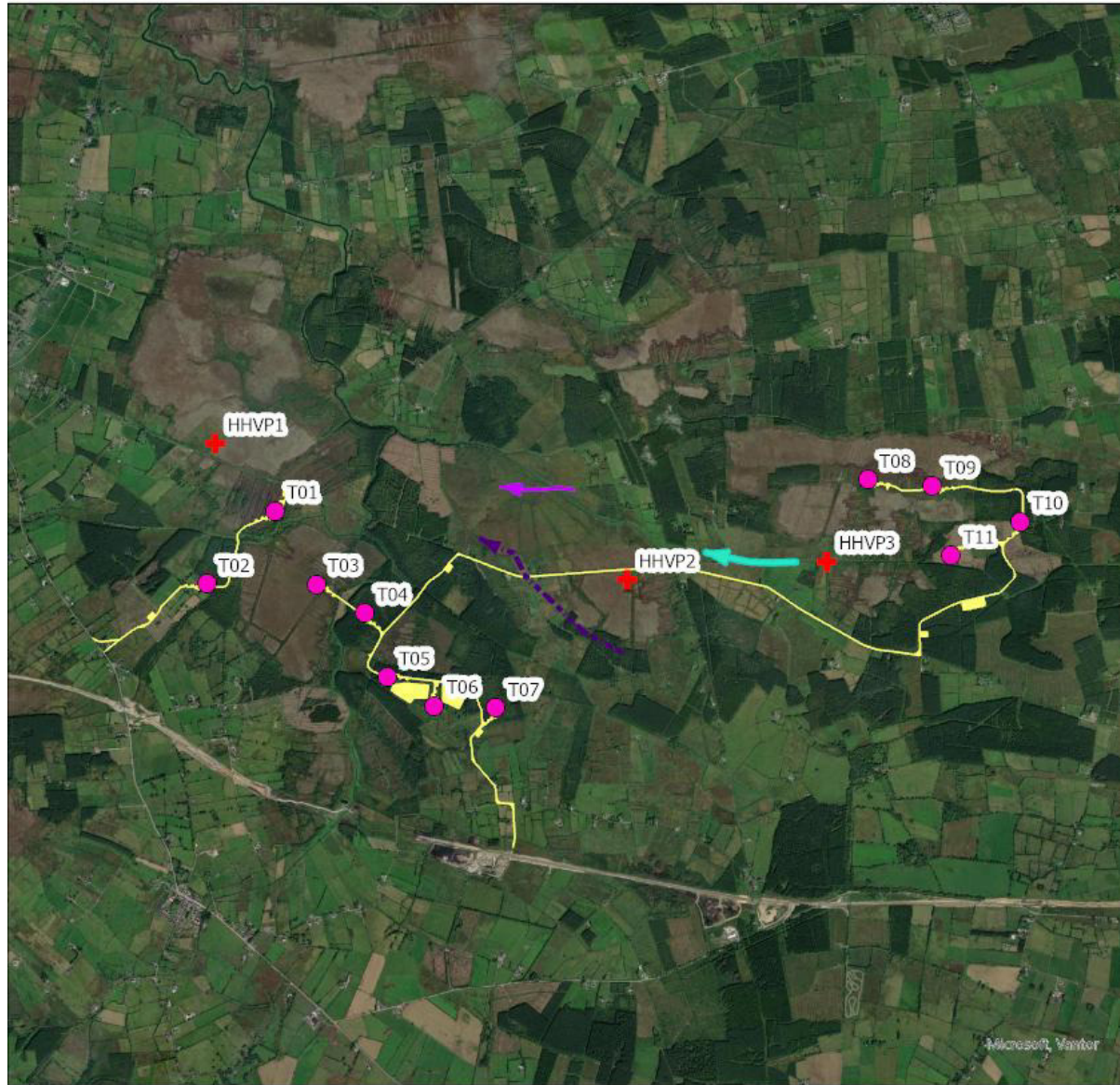
The flight lines recorded for these species during the hinterland vantage point surveys are shown on Figure 3.12.



### 3.4 HEN HARRIER WINTER ROOST SURVEYS

During the Hen Harrier winter roost surveys 1 no. Hen Harrier flight line was recorded during an evening survey completed on the 1<sup>st</sup> February 2024. **Figure 3.13** shows the Hen Harrier flight recorded during the 2023-2024 winter roost survey. The flight was of one male Hen Harrier, flying from east to west over raised bog habitat at 16:36, approximately 40 minutes before sunset. The Hen Harrier was observed in flight and was not observed going to ground to roost.

Aside from Hen Harrier, the other target species recorded during the Hen Harrier surveys comprised individual flights of Lesser Black-backed Gull and Mallard. These flights are shown on **Figure 3.13** below.



## Carrigeen Renewable Energy Development

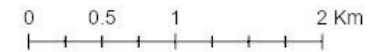
Figure 3.13

### Hen Harrier Roosting Activity Survey Results

- Turbine Locations
- Wind Farm Layout
- + Hen Harrier Vantage Points

### Hen Harrier & Other Target Species

- ↖ Hen Harrier
- ↖ Lesser Black-Backed Gull
- ↖ Mallard



Date	06/03/2026
Drawn By	PD
Source	Maxar

## 4.0 CONCLUSION

During the 2023-2024 non-breeding season vantage point surveys were completed for the Project.

During the vantage point surveys a total of 55 flightlines were recorded comprising 10 no. target species. The activity recorded during the vantage point surveys was dominated by Buzzard and Kestrel both of which accounted for c. 50% of all flight activity recorded. Low levels of flight activity for all other target species were recorded.

A total of 4 red-listed species of high conservation concern (Kestrel, Meadow Pipit, Red Wing & Snipe) and 14 amber-listed species of amber conservation concern were recorded during the 2023-2024 non-breeding season vantage point and transect surveys.

Hen Harrier and Whooper Swan were the only bird species that are listed on Annex 1 of the EC Birds Directive recorded during the vantage point surveys. Aside from the two no. daytime flights of Hen Harrier observed during vantage point surveys, one additional flight of a male Hen Harrier was recorded during an evening dusk survey for Hen Harrier roosting activity. This observation was of a Hen Harrier in flight with the individual bird not observed going to ground. The timing of the observation indicates the likelihood of Hen Harrier roosting in the wider surrounding area.

The Whooper Swan flight recorded was a rare observation of a pair of Whooper Swan commuting through the eastern wind farm parcel.



Carrigeen Renewable Energy  
Development

Bird Survey Report

2024 Breeding season

Doherty Environmental Consultants Ltd.

March 2026

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

This report has been prepared by Doherty Environmental Consultants (DEC) Ltd with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for Carraigin Power Ltd. and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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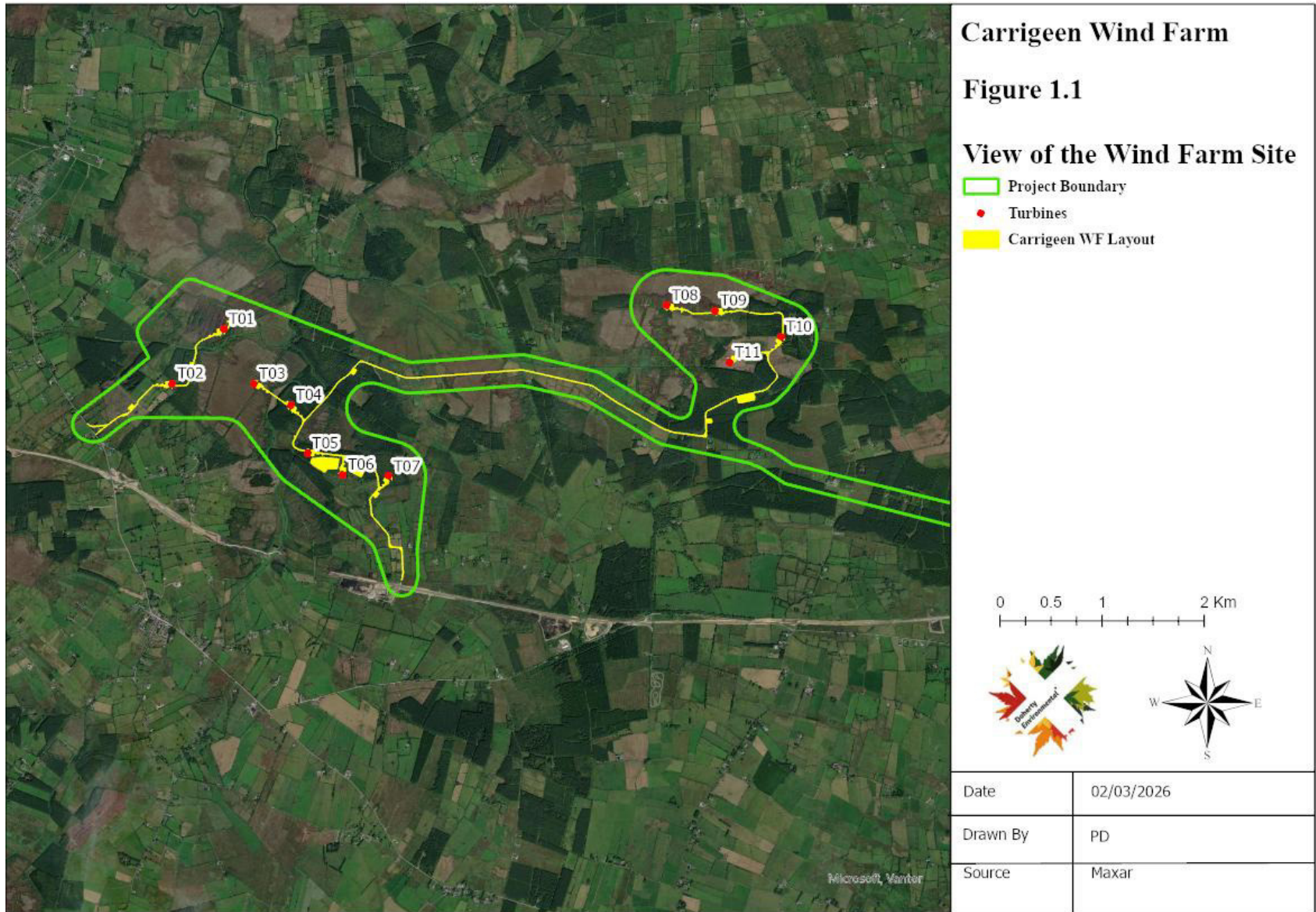
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## **1.0 INTRODUCTION**

Doherty Environmental Consultants (DEC) Ltd have been contracted to carry out ornithological surveys on behalf of Carragain Power Ltd. for the proposed Carrigeen Renewable Energy Development, Co. Roscommon, which consists of a Wind Farm Site, a Grid Connection, and Turbine Delivery Route (altogether the Project). An aerial view of the Wind Farm Site is shown on Figure 1.1.

Surveys commenced at the Wind Farm Site in late March 2022. This report provides details of the surveys completed during the 2024 breeding season (April to September 2024). The 2024 breeding season represents the third round of breeding season ornithological surveys completed for the proposed Project.

The surveys have been undertaken in order to provide a baseline environmental data set, which will be incorporated into the Environmental Impact Assessment (EIA) for the project as required under EU EIA Directive (Council Directive 2011/92/EU, amended in 2014/52/EU).



## 2.0 METHODOLOGY

### 2.1 VANTAGE POINT SURVEYS

The primary objective of the bird surveys completed for the proposed Project is to:

- Establish the presence and behaviour of raptors, waterbirds and other bird species known to be sensitive to collision with wind turbines over the wind farm site;
- Obtain data on the movements of target species which would facilitate an analysis of foraging activity and collision risk;
- Identify any flight paths used by overwintering waterfowl.

The bird surveys involved vantage point surveys of the buildable area. The methodology adopted for the 2024 breeding season vantage point surveys was derived from the Scottish Natural Heritage<sup>1</sup> (SNH) *Recommended bird survey methods to inform impact assessment of onshore wind farms* (2017). SNH guidance for surveys at wind farms recommend that field surveys focus on those species of high nature conservation value for which there is potential for impacts to occur. These target species in Ireland are derived from the following sources:

- Special conservation interest (SCI) bird species of the Special Protection Areas (SPAs) that occur within the zone of influence of a project; and
- those species that are of medium (amber) and high (red) conservation concern (i.e. Red Listed species).

Where species that are included under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;

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<sup>1</sup> Now known as Nature Scot.

- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >200m; 20m to 200m; and <20m<sup>2</sup>; and
- The behaviour of the target species.

SNH guidance (SNH, 2017) outlines specific survey methodologies for onshore wind farm developments. These guidelines recommend that vantage point surveys should be completed across all calendar months when the species is present or likely to be so.

Four vantage points (**VP1** to **VP4**) were used for monitoring of the proposed Wind Farm Site and surrounding area. The location of these vantage points are shown on **Figure 2.1**.

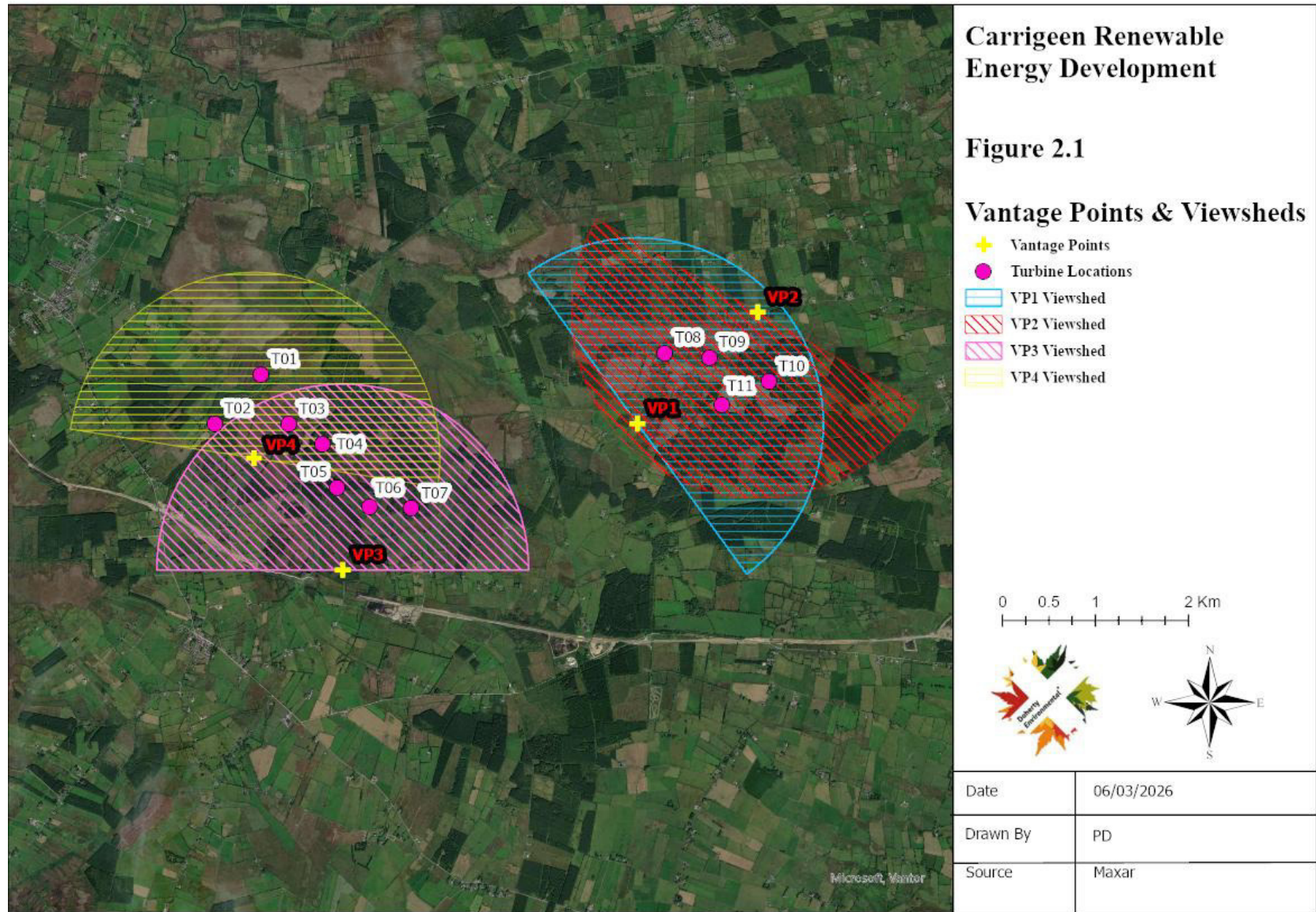
The vantage points were selected following a viewshed analysis of the proposed Wind Farm Site and a 500m buffer area surrounding the Wind Farm Site. The viewshed analysis was completed using QGIS software and is based on an observer height of 1.6m and an observable viewshed from the observer point at a height of 20m. The viewshed afforded from VP1 and VP4 is shown on **Figure 2.1**.

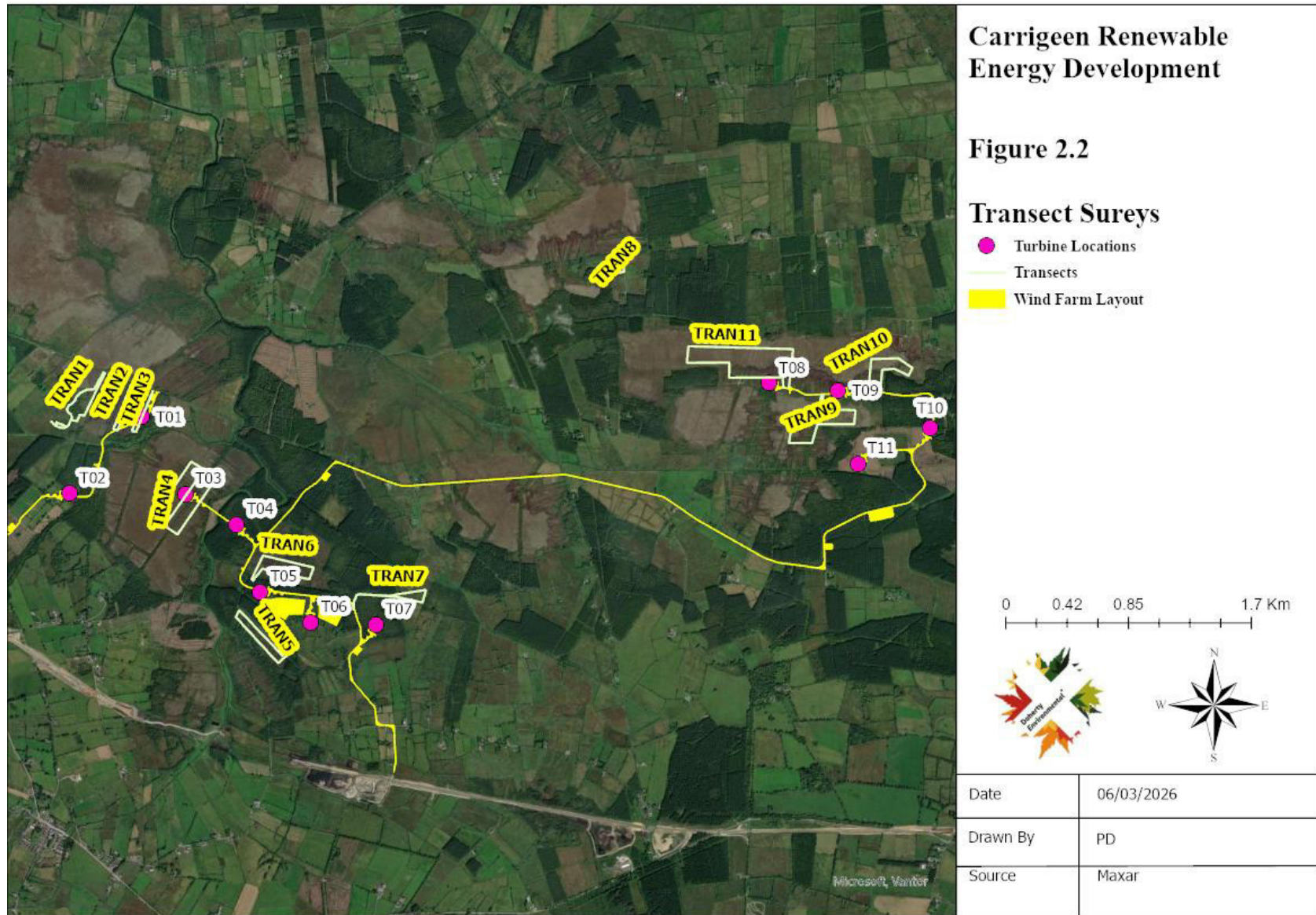
Surveys during the 2024 breeding season commenced in April 2024 and continued monthly until September 2024.

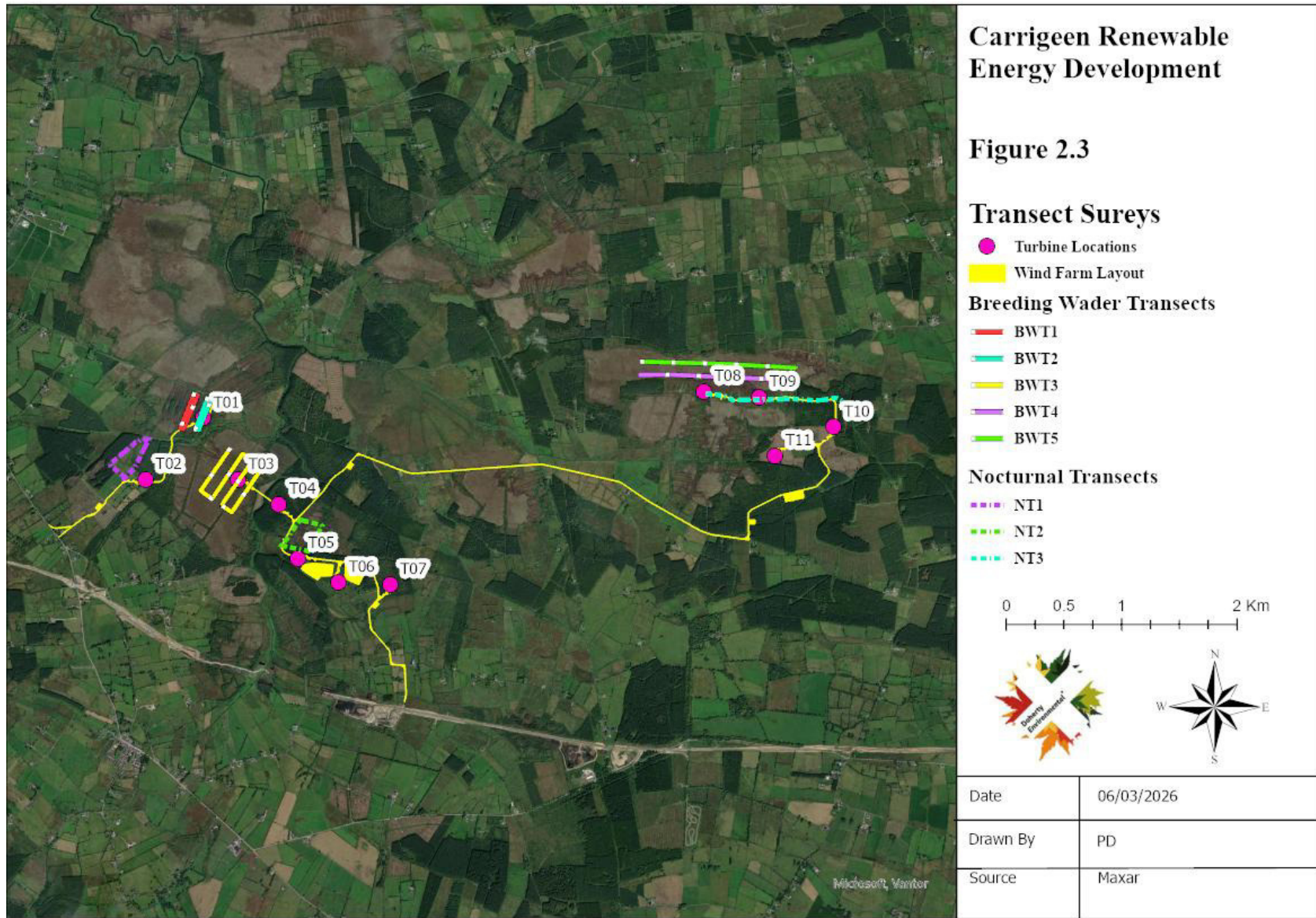
A minimum of 36 hours surveying was completed at all vantage point locations during the breeding season between April and September 2024. The vantage point surveys were completed by undertaking two watches of a duration of 3 hours from each point per month.

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<sup>2</sup> The flight bands are based on the minimum and maximum height (i.e. 22m and 185m respectively) of the rotor blade sweep of typical commercial wind turbines.







## 2.2 BREEDING SEASON TRANSECT SURVEYS

Breeding season transect surveys were completed to record the bird assemblages occurring at the proposed Wind Farm Site. A total of 11 no. transects were completed during the 2024 breeding season. The location and extent of each transect is shown on **Figure 2.2**.

The methodology used was a combination of the Brown and Shepherd (1993), Moorland Bird Survey (MBS) and Common Bird Census techniques. Surveys were undertaken in suitable weather conditions, avoiding times of heavy and persistent rain and strong winds.

Each transect was walked at a steady slow walking speed and all birds seen and heard were recorded. Visual observations of birds were aided by the use of binoculars. The species and number of birds occurring along transects were recorded so that the species assemblage and associated abundance along each transect could be established.

## 2.3 HINTERLAND VANTAGE POINT SURVEYS

Hinterland surveys have been completed for 5 no. hinterland vantage point survey locations (HVP1; HVP2; HVP3; HVP4; and HVP5) in the wider area surrounding the Wind Farm Site. The location of the hinterland surveys and the associated viewshed are shown on **Figure 3.9**. The hinterland survey points were primarily used to survey for the presence of breeding and/or wintering raptors within the wider 2km area surrounding the proposed Wind Farm Site. The surveys were completed in accordance with Hardey et al. (2013). Activity associated with all other target species, as specified in Section 2.1 above was also recorded during the hinterland surveys. The data collection method during the hinterland surveys followed that described for the vantage point surveys at 2.1 above. During the breeding season the hinterland surveys were completed at various times throughout the day.

Each of the hinterland survey points were selected for the views afforded from these points providing coverage of semi-natural habitat with potential to function as roost or breeding sites for raptors as well as the expansive coverage of the surrounding area.:

- HVP 1 is located to the west of the Wind Farm Site and provides a view over an expanse of wetland habitat occurring to the west of the Wind Farm Site.
- HVP2 is located to the north of the Wind Farm Site and provides a view over the raised bog habitat at Cloonshanville Bog.

- HVP3 is located to the north of the proposed Wind Farm Site and provides a view looking south toward the Wind Farm Site over areas of wetland habitat.
- HVP4 is located to the east of the Wind Farm Site and provides an expansive view looking west over the Wind Farm Site.
- HVP5 is located to the south of the Wind Farm Site and provides an expansive view looking north towards the Wind Farm Site over unimproved wet grassland fields.

## 2.4 NOCTURNAL SURVEYS

Nocturnal surveys for bird species that are active at night, such as woodcock and nightjar were completed during the 2024 breeding season. Surveys were completed during April, May and June of 2024. The survey method involved walking transects along the edge of conifer plantation habitat. The transects are shown on **Figure 2.3**.

The aim of the survey was to record the location of any woodcock, nightjar or other less commonly occurring species, not recorded during daytime transect surveys. Any such species seen or heard during the transect surveys were recorded using ArcGIS Field Maps.

## 3.0 RESULTS

### 3.1 VANTAGE POINT

A total of 36 hours of vantage point watching was completed from each vantage point VP1 to VP4 during the April to September vantage point surveys.

A total of 7 target species were recorded during the breeding season vantage point surveys. These species (BTO Code in parenthesis) and their current conservation status are as follows:

**Buzzard (BZ):** conservation status = Green Low conservation concern

**Grey Heron (H.):** conservation status = Green Low conservation concern

**Kestrel (K.):** conservation status = Red (Breeding) High conservation concern

**Lesser Black-Backed Gull (LB):** conservation status - Amber (Breeding and Wintering)  
Medium conservation concern

**Mallard (MA):** conservation status = Amber (Breeding and Wintering) Medium conservation concern

**Short-eared Owl (SE):** conservation status = Amber (Breeding) Medium conservation concern

**Sparrowhawk (SH):** conservation status = Green Low conservation concern

No bird species recorded are listed on Annex 1 of the EC Birds Directive.

A total of 53 flights by target species were recorded during the 2024 breeding season. **Figure 3.1** shows all flights observed during the vantage point surveys. The percentage breakdown of flights recorded per species are set out in Table 3.1 below.

**Table 3.1: Vantage Point Flight lines recorded during the 2024 Breeding season**

Species	No. Flights	Percentage Flights
Buzzard	19	35%
Grey Heron	3	5%
Kestrel	12	22%
Lesser Black-backed Gull	2	4%
Mallard	15	27%
Short-eared Owl	1	2%

Species	No. Flights	Percentage Flights
Sparrowhawk	1	2%

A summary of the observations for each target species is provided in the following subsections.

### **3.1.1 Buzzard**

Buzzard was the most frequently observed species during the 2024 breeding season vantage point surveys. A total of 19 Buzzard flights were observed during the breeding season. Of these 15 flights were of an individual Buzzard; 2 flights were of a pair of Buzzard; and the remaining 2 flights were of 3 Buzzards. This species was recorded flying a variable heights from <20m; 20 to 200m and >200m height bands, with a lower number of flights being recorded at higher elevation >200m.

The range of activity recorded during flights included hunting, commuting, soaring, being mobbed by corvids and a Sparrowhawk; landing to perch on trees.

**Figure 3.2** shows all Buzzard flights observed during the 2024 breeding season.

### **3.1.2 Grey Heron**

A total of 3 Grey Heron flights were observed during the 2024 breeding season. All flights were observed flying low at <50m for short durations (<45 seconds). All flights observed were of individual herons.

**Figure 3.3** shows the Grey Heron flight observed during the 2024 breeding season.

### **3.1.3 Kestrel**

Kestrel was recorded in flight on twelve occasions during the 2024 breeding season. All 12 flights were of an individual kestrel. The majority of the Kestrel flights were observed at low height at <50m. The flight durations ranged from short flights to longer foraging bouts of up to 4 minutes.

The activity recorded during flights was dominated by hunting with commuting flights also recorded.

**Figure 3.4** shows all Kestrel flights observed during the 2024 breeding season.

#### **3.1.4 Lesser Black-backed Gull**

Two no. Lesser Black-backed Gull flights were observed during the 2024 breeding season. One flight was of a pair of birds flying low at <20m over the wind farm western parcel. This flight was observed for a short duration. The second flight was of an individual Lesser Black-backed Gull commuting at height from east to west to the south of the wind farm eastern parcel. This flight was observed for approximately 105 seconds.

**Figure 3.5** shows the Lesser Black-backed Gull flights observed during the 2024 breeding season.

#### **3.1.5 Mallard**

A total of 15 no. Mallard flights were recorded during the 2024 breeding season. Flights were predominantly recorded at low height at <50m with one flight being recorded at 50m to 100m within the 20 to 200m height band. All flights were of short duration being <60 seconds. Individual and pairs made up five flights respectively, whilst three Mallard were counted during 3 flights and 5 were counted during 2 flights.

The majority of flights were indicative of commuting, with three being indicative of flushed/agitated flight.

**Figure 3.6** shows the Mallard flights observed during the 2024 breeding season.

#### **3.1.6 Short-eared Owl**

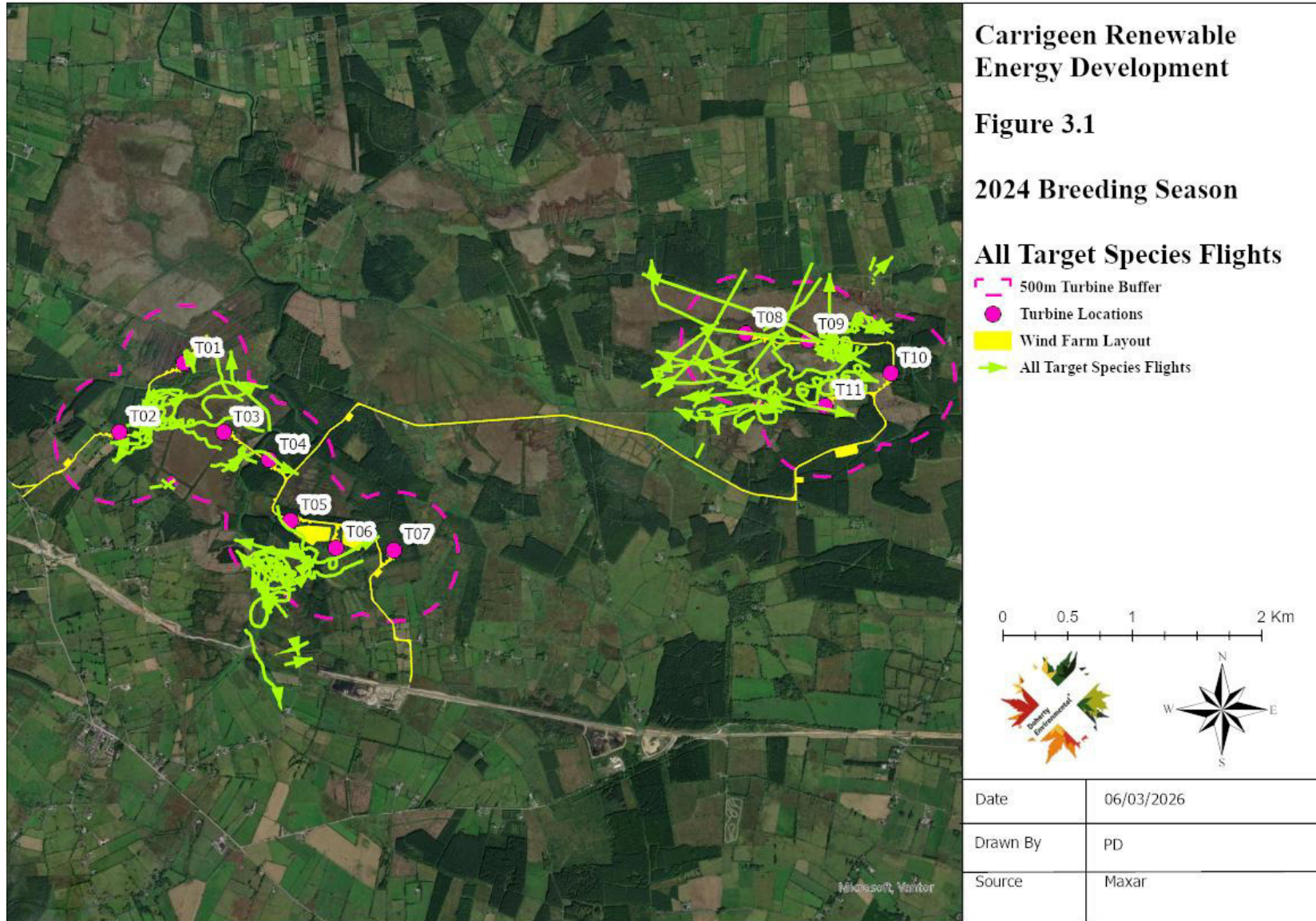
One flight of a Short-eared Owl was recorded in May during the 2024 breeding season. This was of an individual owl perched on a fence post to the south of the wind farm eastern parcel. The owl was observed perched for c. 30 seconds before flying in a south-westerly direction .

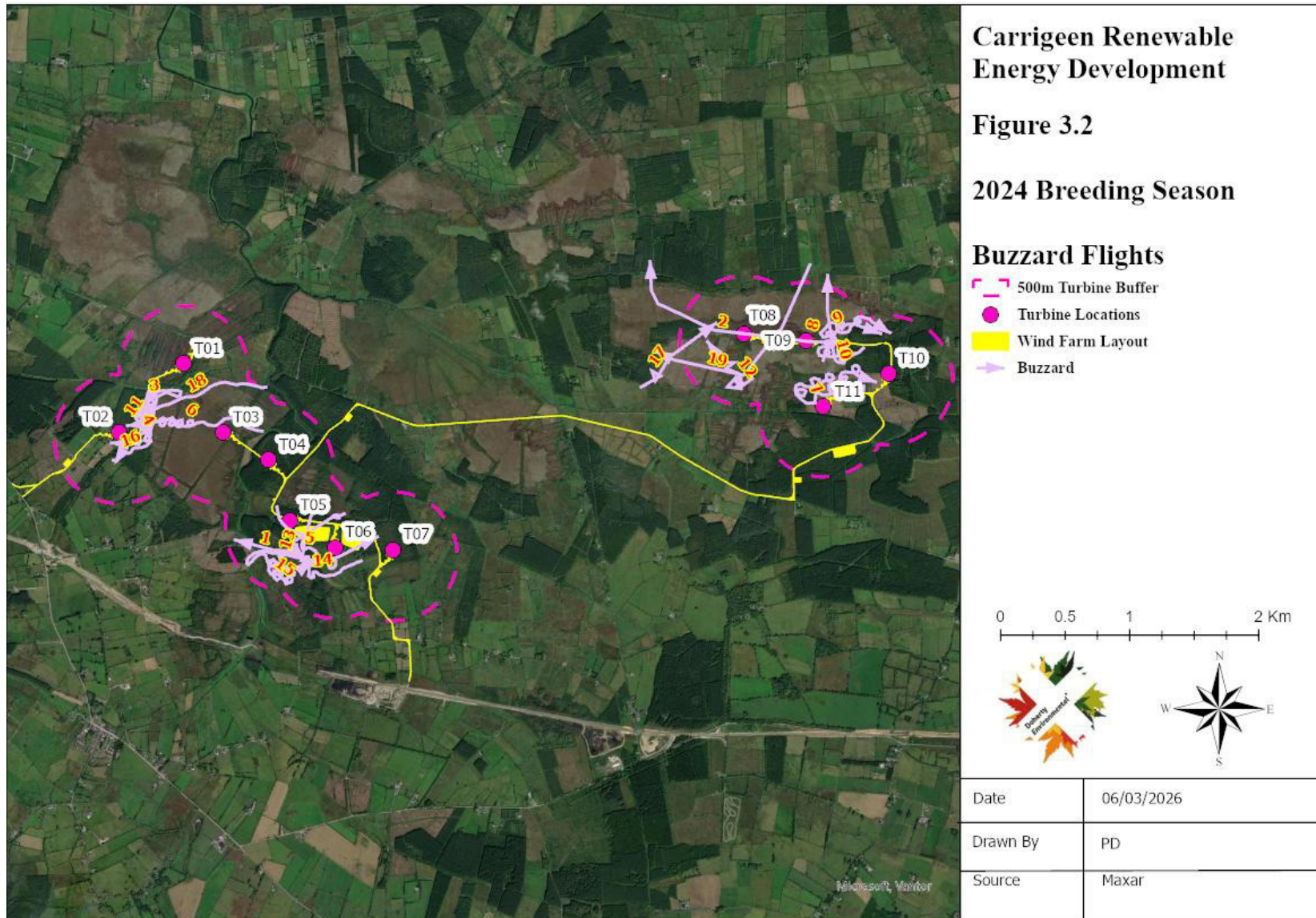
**Figure 3.7** shows the Short-eared Owl flight observed during the 2024 breeding season.

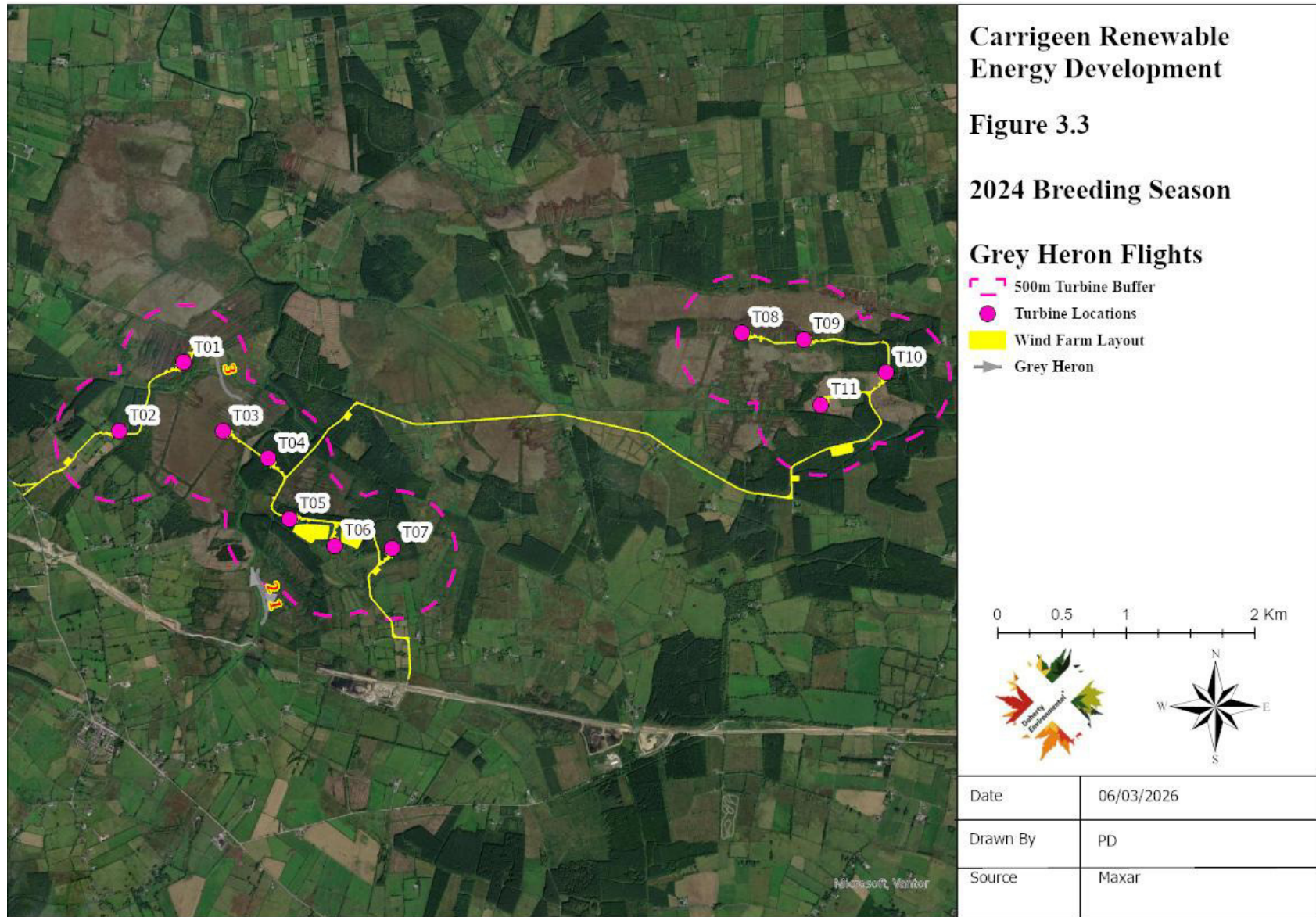
### **3.1.7 Sparrowhawk**

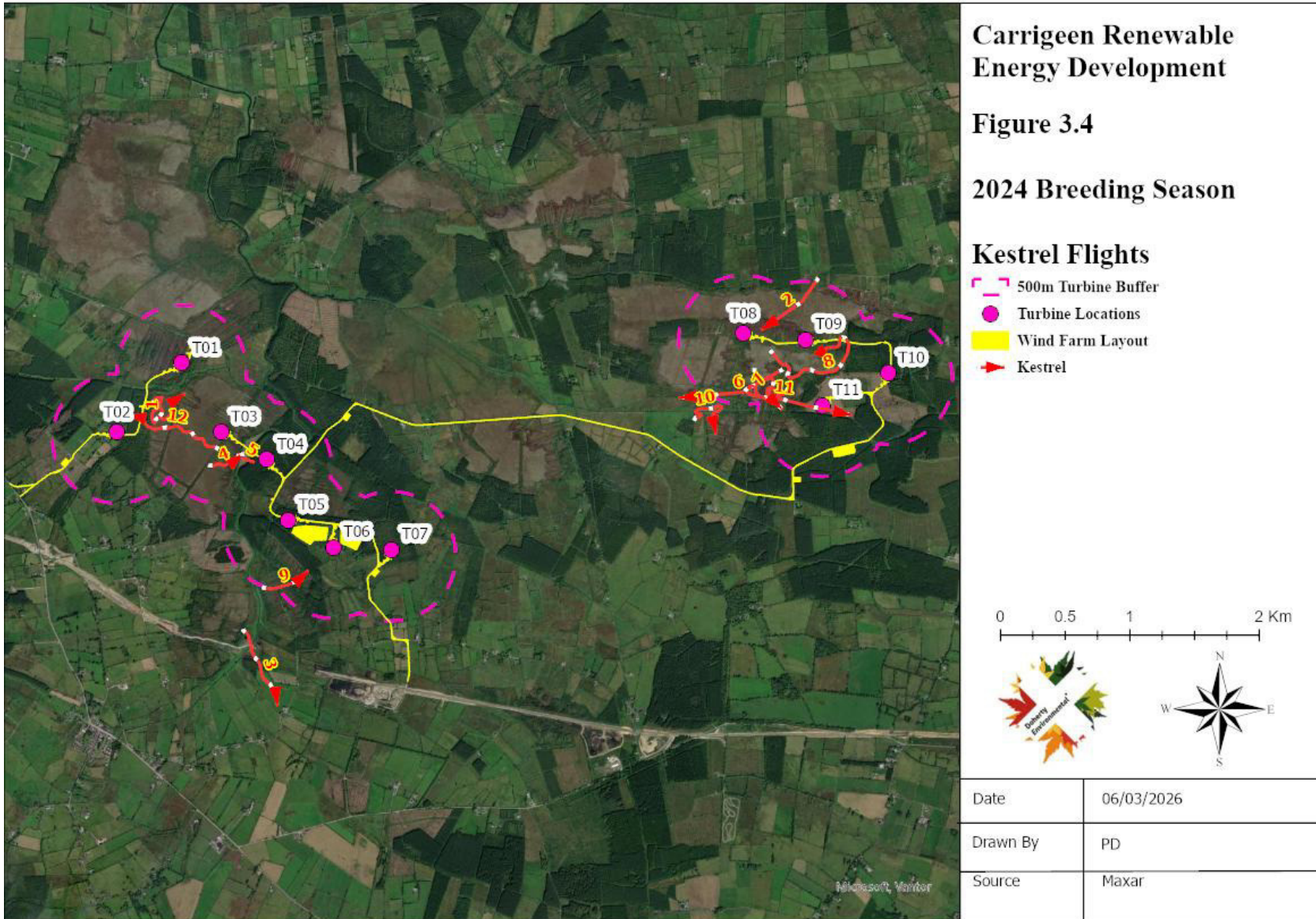
One flight of a Sparrowhawk was recorded during the 2024 breeding season. This flight was of a Sparrowhawk mobbing a Buzzard. The flight was observed at c. 120m and lasted for c. 75 seconds.

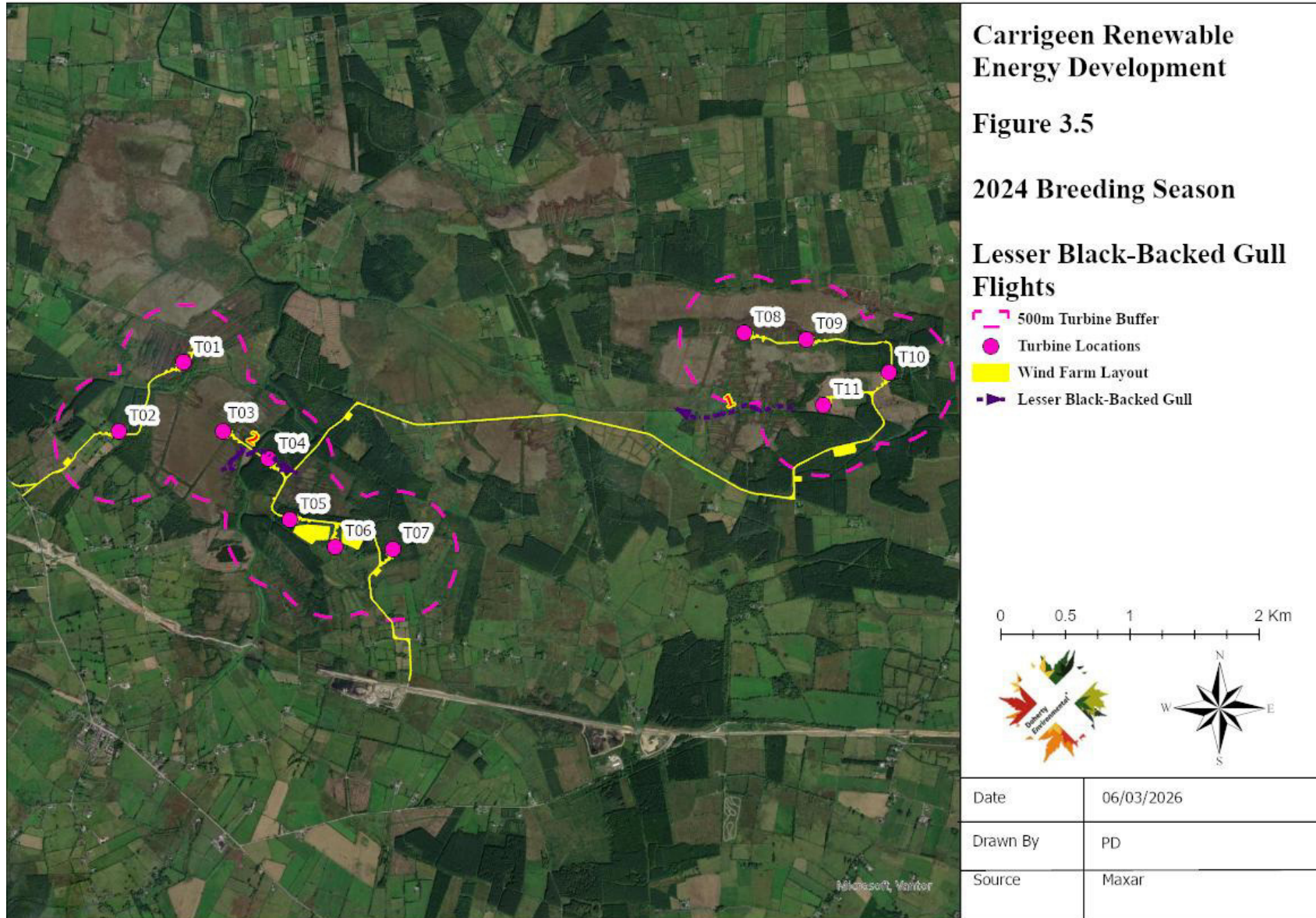
**Figure 3.8** shows the Sparrowhawk flight observed during the 2024 breeding season.

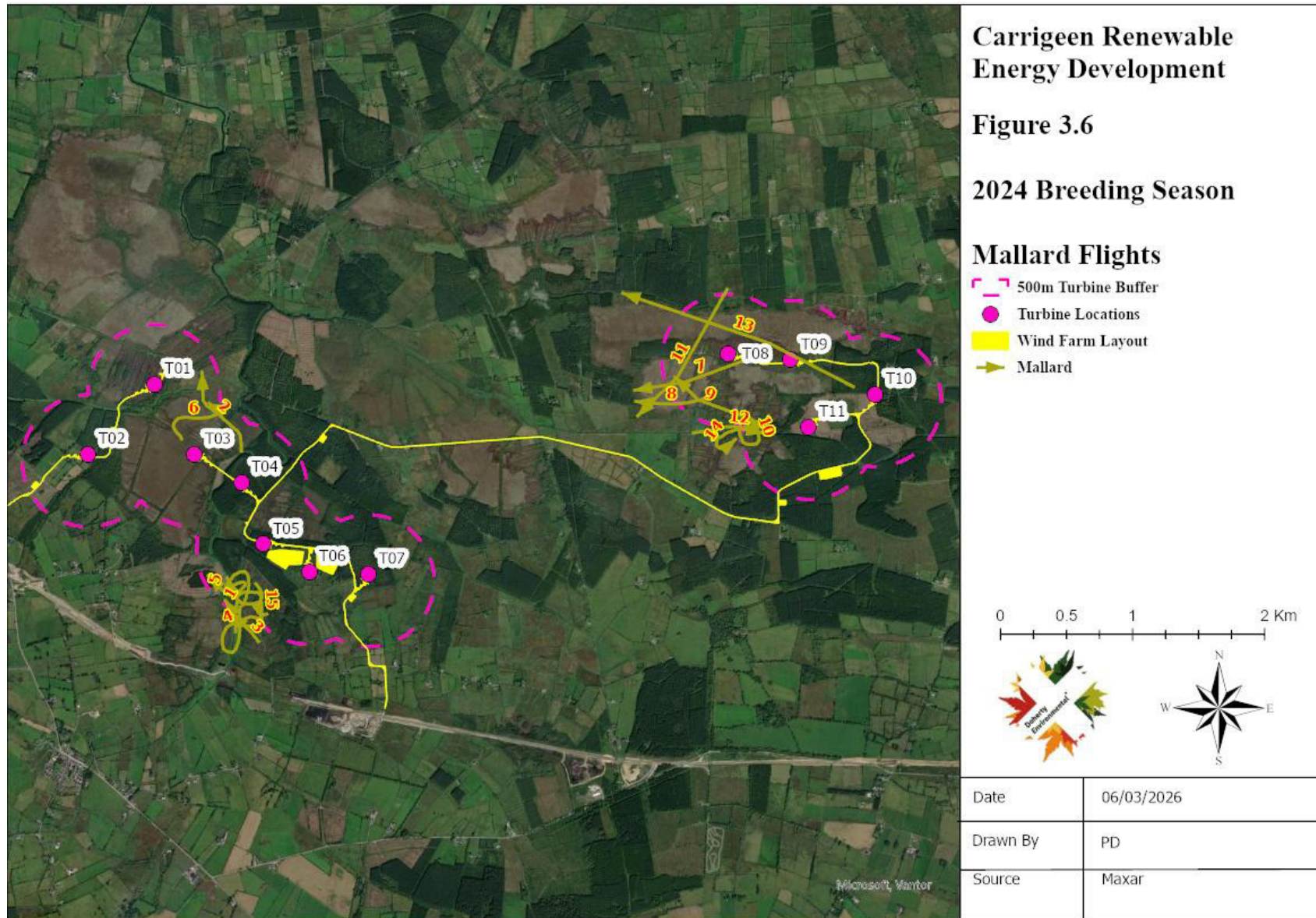


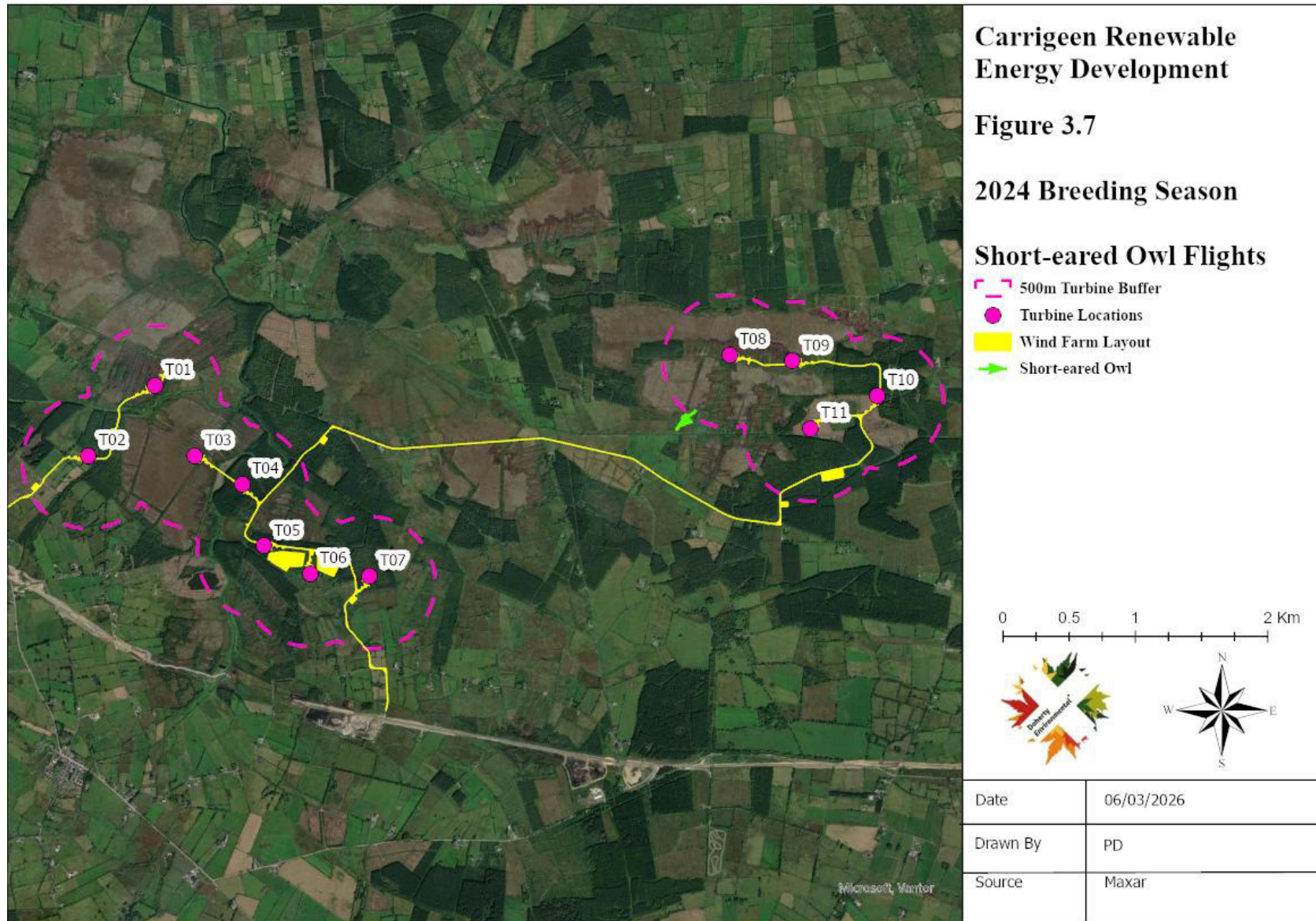


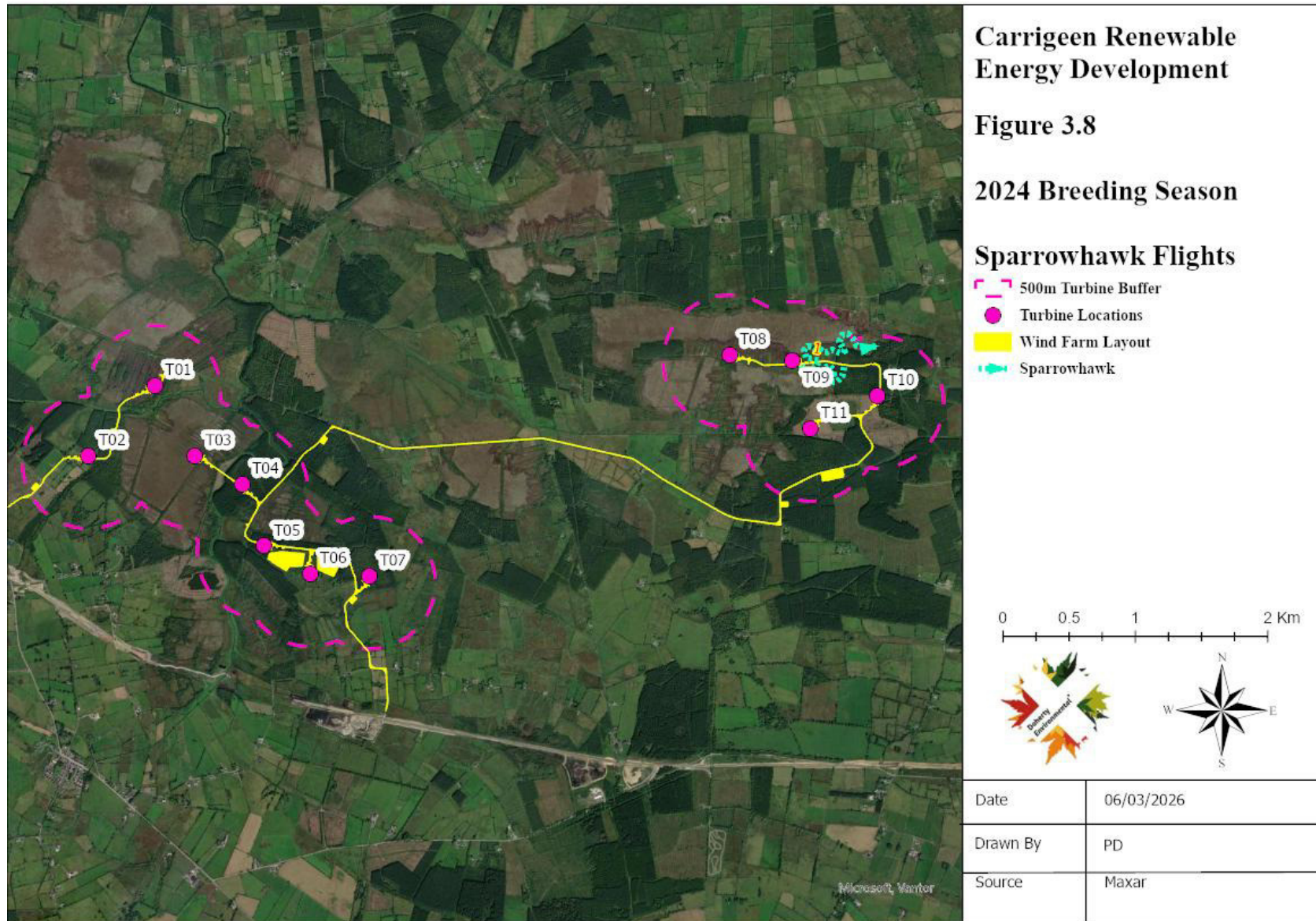












### **3.2 TRANSECT SURVEYS**

The results of the transect surveys completed between April and September 2024 are provided in Table 3.2 below. A total of 47 species were recorded during the breeding season transect surveys. The majority of the species recorded are of low conservation concern (Green-listed species). Nine species of medium conservation concern (Amber-listed species) were recorded. These are Goldcrest, Greenfinch, Linnet, Mallard, Skylark, Starling, Swallow, Teal and Willow Warbler. Three species of high conservation concern (Red-Listed Species), namely Kestrel, Meadow Pipit and Snipe were recorded during the survey. Kestrel was recorded along transect 1 and 8. Meadow Pipit was recorded from all transects with the exception of Transect 3 and 8. Snipe was recorded along Transect 1; 4; 6; 9 and 10.

**Table 3.2: 2024 Breeding Season Transect Survey Results**

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			09/04	15/05	19/06	09/04	15/05	19/06	09/04	15/05	19/06	09/04	15/05	19/06	05/04	15/05	16/06	05/04	15/05	16/06
Blackbird	Green	No	3	4	7	2	4			4		2		4	2	2	2	1		
Blackcap	Green	No	1		1		1													
Blue Tit	Green	No	4	2	2	2							1	1	1	1	1			
Bullfinch	Green	No	1					1												
Buzzard	Green	No		1						5										
Chaffinch	Green	No	4	5	4		5			1		5	3	4	2	2	2	1		
Chiffchaff	Green	No	2	1	2	1	1					1	1	1		1				
Coal Tit	Green	No	3	2	3	2							1		1					
Crossbill	Green	No											2	2						
Cuckoo	Green	No		2				1		2		2								
Dunnock	Green	No					2						1	1						
Fieldfare	Green	No																		
Golderest	Amber	No	1	3						3		3	1	3	4	2	4	2		
Goldfinch	Green	No					3													
Great Tit	Green	No	2	5		1			1	1	1		1	1	2		1			
Greenfinch	Amber	No	1	1																
Grey Heron	Green	No																		
Hen Harrier	Amber	Yes																		
Hooded Crow	Green	No															1			
House Martin	Amber	No																		
House Sparrow	Amber	No																		
Jay	Green	No	1																	

Jackdaw	Green	No				1														
Kestrel	Red	No					1													
Lesser Black-backed Gull	Amber	No																		
Lesser Redpoll	Green	No				1		1	3	1							2	2		
Linnet	Amber	No	2	1	2	1	1		1								3	2		
Long-tailed Tit	Green	No	7	4	3	4	2	2									3		2	
Magpie	Green	No		1		2		1												
Mallard	Amber	No					2													
Meadow Pipit	Red	No	2		1	3	2	2			3	3	4	2	2	3	4	5	1	
Mistle Thrush	Green	No																		
Pheasant	Green	No				1														
Pied Wagtail	Green	No	1		1		1													
Raven	Green	No	2																	
Red Wing	Red	No																		
Reed Bunting	Green	No	2	1			1			1			1		1		1	1		
Robin	Green	No	2	4	4		1				3		1	2			4	2		
Rook	Green	No		1		1														
Siskin	Green	No		1	3						1	3	3							
Skylark	Amber	No	8	11	2	3	2			3		3	2		3	3			3	
Snipe	Red	No	2	2							1	3						1	1	
Song Thrush	Green	No	3				3				1									
Sparrowhawk	Green	No	1																	
Starling	Amber	No		13														2		
Stonechat	Green	No	2	1	3		2	2	2	1		1	1		1				1	1
Swallow	Amber	No	7	2	6	4	4	6	2	4		1		2	1	4	2	1		
Teal	Amber	No		1			1			1		1			1				1	

Treecreeper	Green	No	1	2		1	1			2			2			2			2	
Whitethroat	Green	No					1	1												
Willow Warbler	Amber	No	4	1			2		2	1		2	1			1			1	
Woodpigeon	Green	No		2		2	4	3		4		3	3		7		5	6	1	3
Wren	Green	No	3	1	1		1		2	1					3	2		1	1	1

Species	BoCCI	Annex 1	Transect 7			Transect 8			Transect 9			Transect 10			Transect 11					
			05/04	15/05	16/06	09/04	20/05	19/06	09/04	20/05	19/06	09/04	20/05	19/06	09/04	20/05	19/06			
Blackbird	Green	No				1	2	1		4			1	1						
Blackcap	Green	No				1	1													
Blue Tit	Green	No	1	1																
Bullfinch	Green	No				1			1	2	2									
Buzzard	Green	No		5									5				5			
Chaffinch	Green	No	4	1	4	3	4				1		1				1			
Chiffchaff	Green	No	1	1	1				1	4	1									
Coal Tit	Green	No	3	3	1	2	1	3	1	1	1									
Crossbill	Green	No							1	3										
Cuckoo	Green	No	1	2									2						2	
Dunnock	Green	No				1	1	1		2										
Fieldfare	Green	No																		
Goldcrest	Amber	No	8	3	5								3						3	
Goldfinch	Green	No							2	3										
Great Tit	Green	No	2	3		2	1						2							
Greenfinch	Amber	No							1	1	2									

Grey Heron	Green	No															
Hen Harrier	Amber	Yes															
Hooded Crow	Green	No	6	3	2	3	1			5		1	4				
House Martin	Amber	No															
House Sparrow	Amber	No															
Jay	Green	No															
Jackdaw	Green	No		3					2	3				3		2	
Kestrel	Red	No				1											
Lesser Black-backed Gull	Amber	No															
Lesser Redpoll	Green	No	1	1	2				1					1	2	1	
Linnet	Amber	No				2			1	1							
Long-tailed Tit	Green	No	1	2					3	2							
Magpie	Green	No	4														
Mallard	Amber	No					2										
Meadow Pipit	Red	No	1	2					5	5	6	5	5	6	8	6	8
Mistle Thrush	Green	No															
Pheasant	Green	No							1								
Pied Wagtail	Green	No			1											2	
Raven	Green	No				1											
Red Wing	Red	No															
Reed Bunting	Green	No		1			1			1			1			1	
Robin	Green	No	3	1	1	1	2		2	4	2				2		
Rook	Green	No							4	2	2						
Siskin	Green	No	1	1	2									1			
Skylark	Amber	No	2	1			3			3		1	3		5	3	7
Snipe	Red	No								2			1				

Song Thrush	Green	No															
Sparrowhawk	Green	No															
Starling	Amber	No								4							
Stonechat	Green	No	3	2	2	2	3	1		1			1				1
Swallow	Amber	No							3	2	1		1				1
Teal	Amber	No					1			1			1				1
Treecreeper	Green	No								2			2				2
Whitethroat	Green	No															
Willow Warbler	Amber	No				2	3		1		3	2	1				1
Woodpigeon	Green	No		3		1		2	5	1							
Wren	Green	No	1	1	1	2	3	3	4	1	2		3	1			

### 3.3 HINTERLAND VANTAGE POINT SURVEYS

A total of six no. species and 10 no. flight observations were recorded during the 2024 breeding season hinterland vantage point surveys. These comprise Buzzard, Cormorant, Kestrel, Lesser Black-backed Gull, Mallard and Teal. The flights observed were comprised of the follows:

Four no. flights of individual Buzzard from HVP1, 2 and 4;

One no. Cormorant flight was recorded during a hinterland vantage point watch at HVP1 during April;

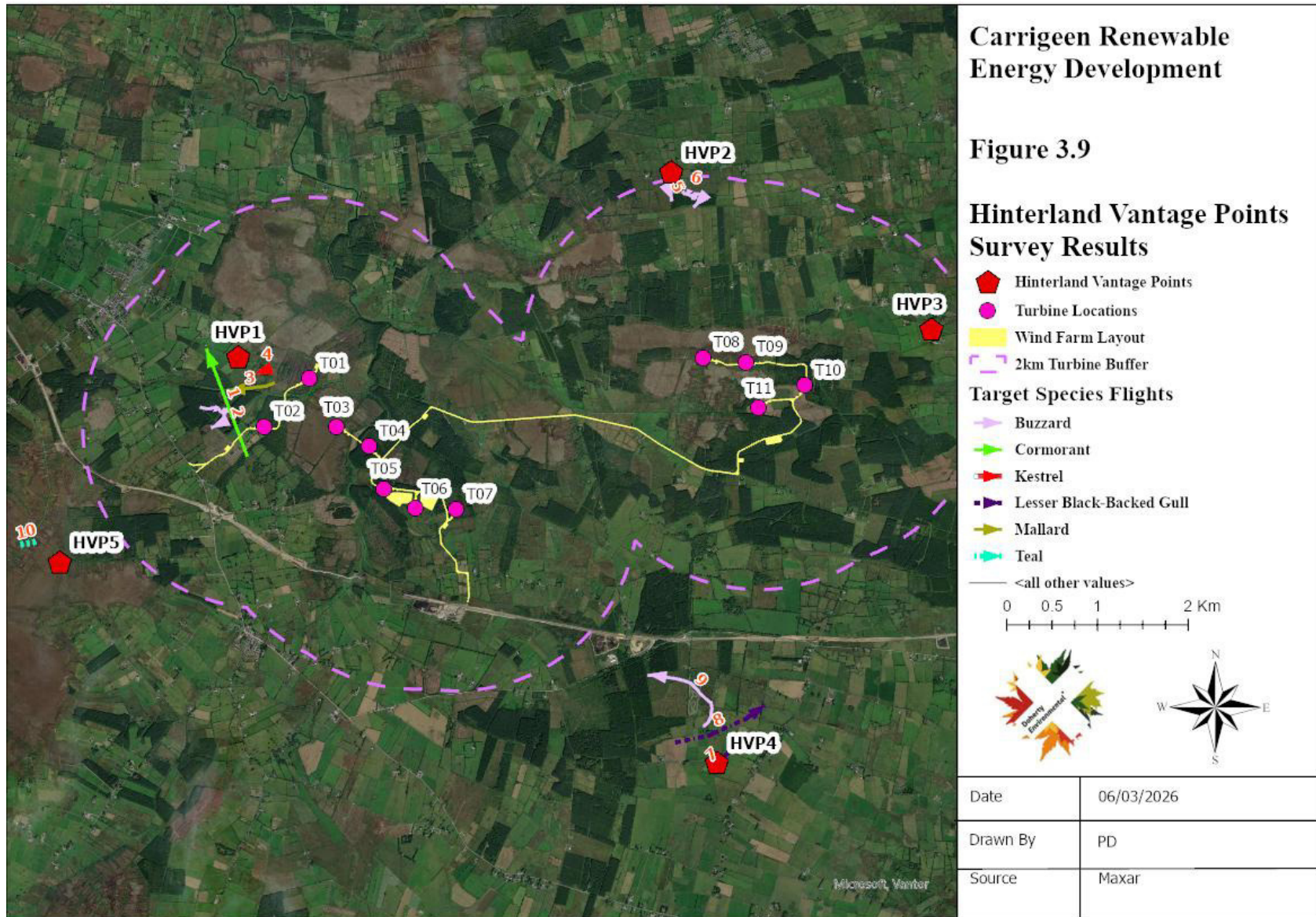
Four no. Kestrel flights were recorded from HVP 1, 3, 4 and 5;

Two no. flights of a commuting Lesser Black-Backed Gull were observed from HVP4 during June. One flight was of an individual Lesser Black-backed Gull whilst the other was of 3 gulls.

One no. flight of an individual Mallard was recorded from HVP1; and

One no. flight of an individual Teal was recorded from HVP5 during July.

The flight lines recorded for these species during the hinterland vantage point surveys are shown on Figure 3.9.



### **3.4 NOCTURNAL SURVEYS**

No evidence of nocturnal target species comprising Woodcock and Nightjar were recorded during the nocturnal transect surveys.

### **3.5 MERLIN SURVEY**

No evidence indicating the presence of breeding merlin were recorded during the breeding merlin surveys.

### **4.0 CONCLUSION**

During the 2024 breeding season vantage point surveys were completed for the Project.

During the vantage point surveys a total of 53 flightlines were recorded comprising 7 no. target species. The activity recorded during the vantage point surveys was dominated by Buzzard, Mallard and Kestrel, which together accounted for c. 85% of all flight activity recorded. Low levels of flight activity for all other target species were recorded.

A total of 3 red-listed species of high conservation concern (Kestrel, Meadow Pipit & Snipe) and 12 amber-listed species of medium conservation concern (Cormorant, Goldcrest, Greenfinch, Lesser Black-backed Gull, Linnet, Mallard, Short-eared Owl, Skylark, Starling, Swallow, Teal and Willow Warbler) were recorded during the 2024 breeding season surveys.

No bird species listed on Annex 1 of the EC Birds Directive were recorded during the 2024 breeding season surveys.



Carrigeen Renewable Energy  
Development

Bird Survey Report

2024/2025 Non-Breeding Season

Doherty Environmental Consultants Ltd.

March 2026

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

This report has been prepared by Doherty Environmental Consultants (DEC) Ltd with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for Carraigin Power Ltd. and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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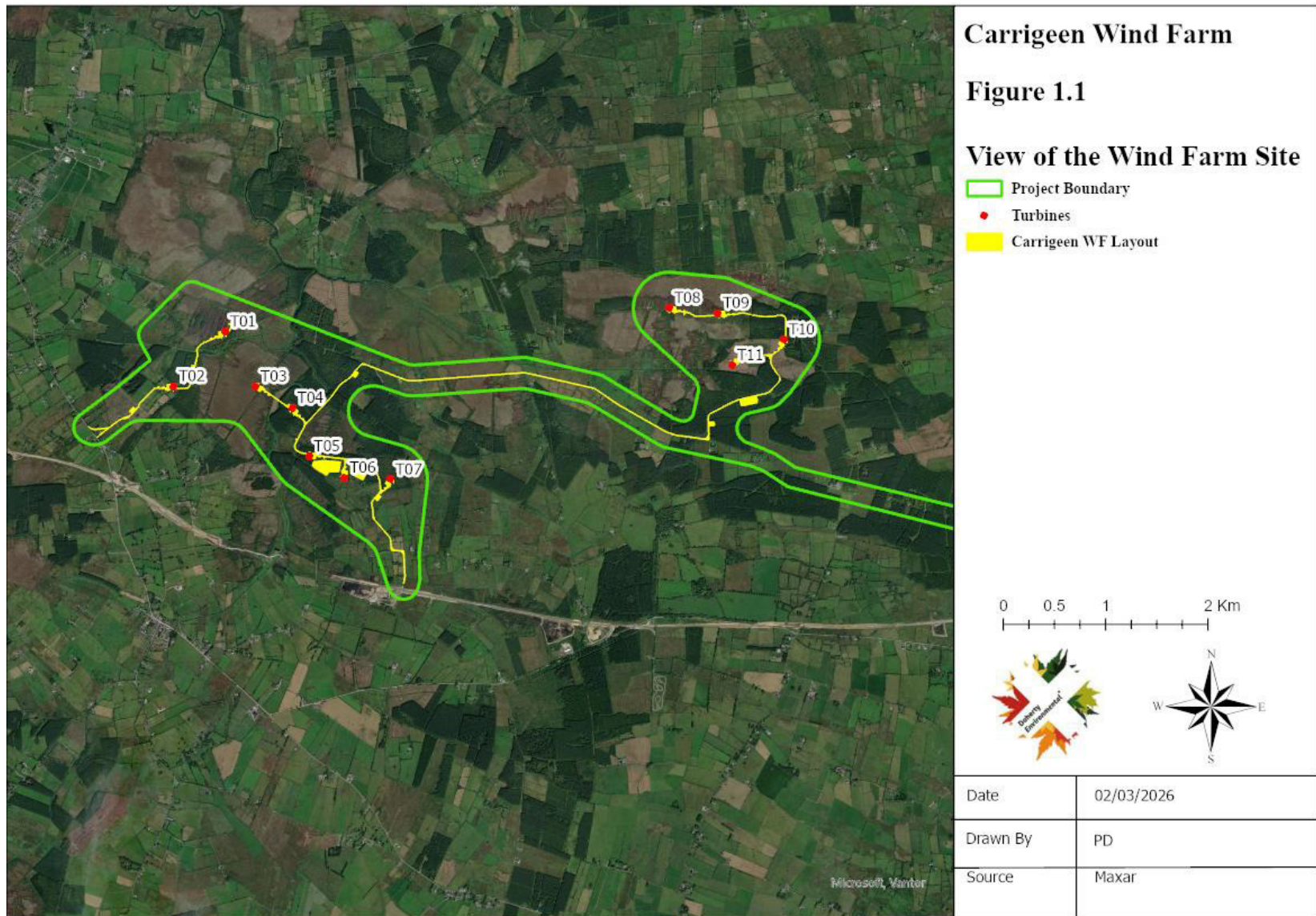
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## **1.0 INTRODUCTION**

Doherty Environmental Consultants (DEC) Ltd have been contracted to carry out ornithological surveys on behalf of Carraigin Power Ltd. for the proposed Carrigeen Renewable Energy Development, Co. Roscommon, which consists of a Wind Farm Site, a Grid Connection, and Turbine Delivery Route (altogether the Project). An aerial view of the Wind Farm Site is shown on Figure 1.1.

Surveys commenced at the Wind Farm Site in late March 2022. This report provides details of the surveys completed during the 2024/2025 non-breeding season (October 2024 to March 2025). The 2024/2025 non-breeding season represents the second round of non-breeding season ornithological surveys completed for the proposed Project.

The surveys have been undertaken in order to provide a baseline environmental data set, which will be incorporated into the Environmental Impact Assessment (EIA) for the project as required under EU EIA Directive (Council Directive 2011/92/EU, amended in 2014/52/EU).





## 2.0 METHODOLOGY

### 2.1 VANTAGE POINT SURVEYS

The primary objective of the bird surveys completed for the proposed Project is to:

- Establish the presence and behaviour of raptors, waterbirds and other bird species known to be sensitive to collision with wind turbines over the Wind Farm Site;
- Obtain data on the movements of target species which would facilitate an analysis of foraging activity and collision risk;
- Identify any flight paths used by overwintering waterfowl.

The bird surveys involved vantage point surveys of the buildable area. The methodology adopted for the 2024/2025 non-breeding season vantage point surveys was derived from the Scottish Natural Heritage<sup>1</sup> (SNH) *Recommended bird survey methods to inform impact assessment of onshore wind farms* (2017). SNH guidance for surveys at wind farms recommend that field surveys focus on those species of high nature conservation value for which there is potential for impacts to occur. These target species in Ireland are derived from the following sources:

- Special conservation interest (SCI) bird species of the Special Protection Areas (SPAs) that occur within the zone of influence of a project; and
- those species that are of medium (amber) and high (red) conservation concern (i.e. Red Listed species).

Where species that are included under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;

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<sup>1</sup> Now known as Nature Scot.

- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >200m; 20m to 200m; and <20m<sup>2</sup>; and
- The behaviour of the target species.

SNH guidance (SNH, 2017) outlines specific survey methodologies for onshore wind farm developments. These guidelines recommend that vantage point surveys should be completed across all calendar months when the species is present or likely to be so.

Four vantage points (**VP1** to **VP4**) were used for monitoring of the Wind Farm Site and surrounding area. The location of these vantage points are shown on **Figure 2.1**.

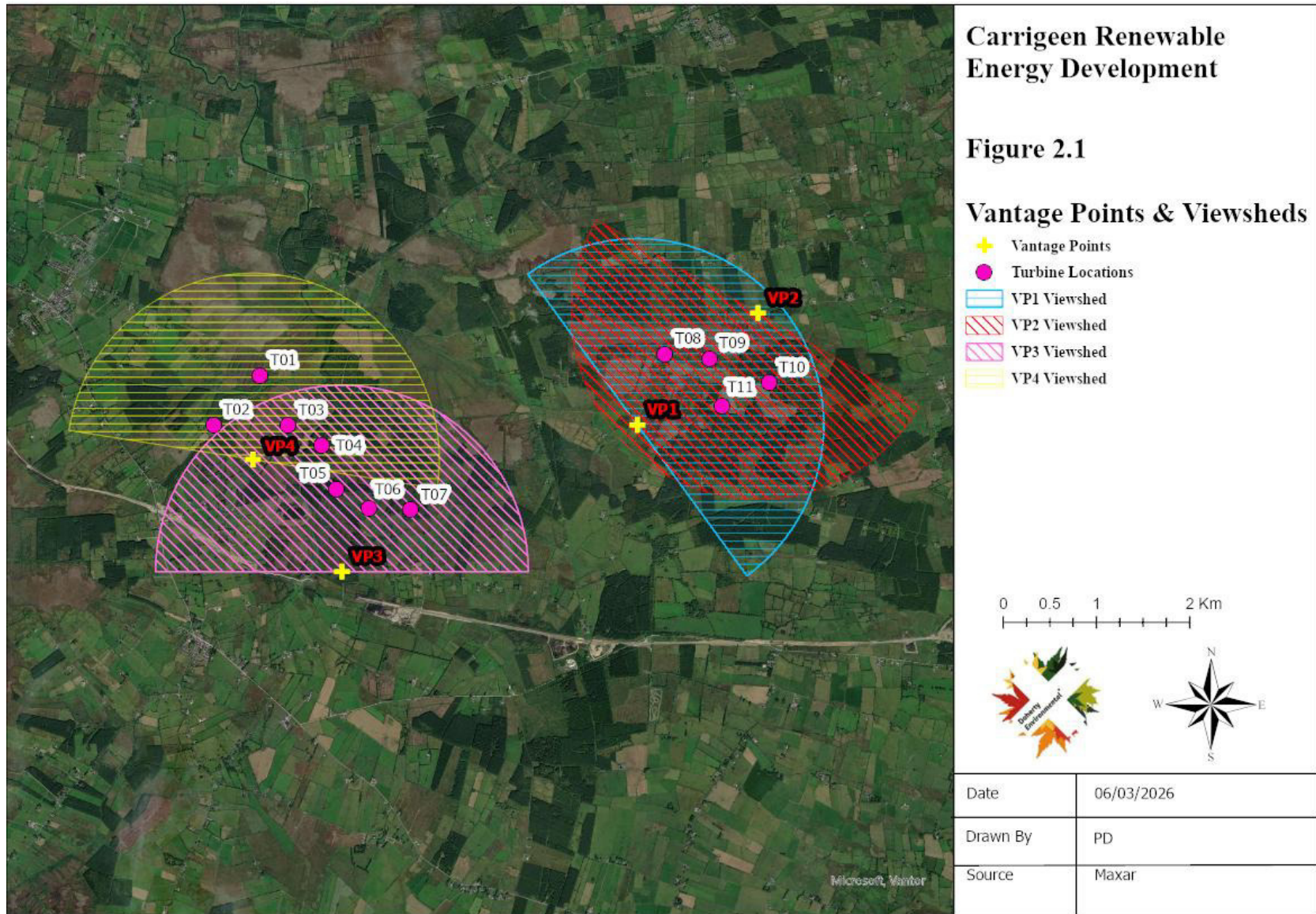
The vantage points were selected following a viewshed analysis of the proposed Wind Farm Site and a 500m buffer area surrounding the Wind Farm Site. The viewshed analysis was completed using QGIS software and is based on an observer height of 1.6m and an observable viewshed from the observer point at a height of 20m. The viewshed afforded from VP1 and VP4 is shown on **Figure 2.1**.

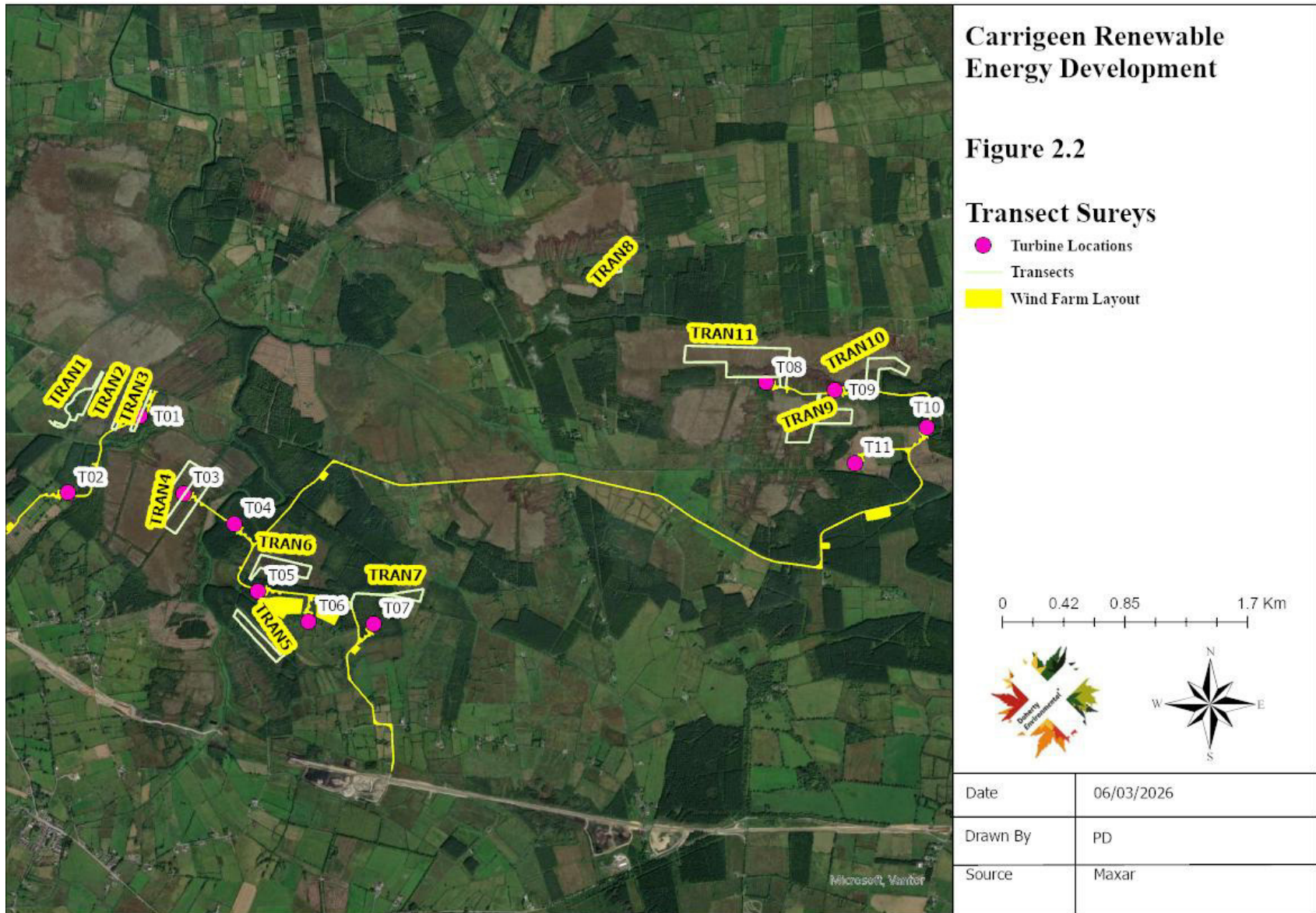
Surveys during the 2024/2025 non-breeding season commenced in October 2024 and continued monthly until March 2025.

A minimum of 36 hours surveying was completed at all vantage point locations during the non-breeding season between October 2024 and March 2025. The vantage point surveys were completed by undertaking two watches of a duration of 3 hours from each point per month.

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<sup>2</sup> The flight bands are based on the minimum and maximum height (i.e. 22m and 185m respectively) of the rotor blade sweep of typical commercial wind turbines.





## 2.2 NON-BREEDING SEASON TRANSECT SURVEYS

Non-breeding season transect surveys were completed to record the bird assemblages occurring at the proposed Wind Farm Site. A total of 11 no. transects were completed during the 2024/2025 non-breeding season. The location and extent of each transect is shown on **Figure 2.2**.

The methodology used was a combination of the Brown and Shepherd (1993), Moorland Bird Survey (MBS) and Common Bird Census techniques. Surveys were undertaken in suitable weather conditions, avoiding times of heavy and persistent rain and strong winds.

Each transect was walked at a steady slow walking speed and all birds seen and heard were recorded. Visual observations of birds were aided by the use of binoculars. The species and number of birds occurring along transects were recorded so that the species assemblage and associated abundance along each transect could be established.

## 2.3 HINTERLAND VANTAGE POINT SURVEYS

Hinterland surveys have been completed for 5 no. hinterland vantage point survey locations (HVP1; HVP2; HVP3; HVP4; and HVP5) in the wider area surrounding the Wind Farm Site. The location of the hinterland surveys and the associated viewshed are shown on **Figure 3.10**. The hinterland survey points were primarily used to survey for the presence of breeding and/or wintering raptors within the wider 2km area surrounding the proposed Wind Farm Site. The surveys were completed in accordance with Hardey et al. (2013). Activity associated with all other target species, as specified in Section 2.1 above was also recorded during the hinterland surveys. The data collection method during the hinterland surveys followed that described for the vantage point surveys at 2.1 above. During the non-breeding season the hinterland surveys were timed to coincide with twilight with surveys either commencing before first light or terminating after last light. The non-breeding season hinterland surveys were completed during these times to maximise the potential for identifying roost sites.

Each of the hinterland survey points were selected for the views afforded from these points providing coverage of semi-natural habitat with potential to function as roost or breeding sites for raptors as well as the expansive coverage of the surrounding area:

- HVP 1 is located to the west of the Wind Farm Site and provides a view over an expanse of wetland habitat occurring to the west of the Wind Farm Site.
- HVP2 is located to the north of the proposed Wind Farm Site and provides a view looking south toward the Wind Farm Site over areas of wetland habitat.
- HVP3 is located to the east of the Wind Farm Site and provides an expansive view looking west over the Wind Farm Site.
- HVP4 is located to the south of the Wind Farm Site and provides an expansive view looking north towards the Wind Farm Site over unimproved wet grassland fields.
- HVP5 is located to the southwest of the Wind Farm Site and provides a view over the northern area over Bellanagare Bog SPA.

## 2.4 HEN HARRIER ROOSTING ACTIVITY SURVEY

Hen Harrier winter roost surveys were completed for areas of suitable roost habitat within the 2km buffer area of the Wind Farm Site. The non-breeding season vantage point surveys and the hinterland vantage point surveys were both timed to target observations of Hen Harrier roosting activity within the Wind Farm Site and immediate surrounding area and in the wider 2km surrounding area. The Hen Harrier winter roost surveys were completed in addition to these surveys and targeted specific areas of suitable Hen Harrier roosting habitat in the vicinity of the Wind Farm Site. Three no. Hen Harrier winter roost vantage points (HHVP1 to HHVP3) were completed. The location of these vantage points are shown on **Figure 3.11**. HHVP1 provided targeted survey of the Cloonashanville Bog to the north of the Wind Farm Site; HHVP2 provided targeted survey of the remnant raised bog habitat located between the western and eastern wind farm parcels; and HHVP3 provided targeted survey of degraded raised bog and wetland habitat to the southeast of the eastern wind farm parcel.

## 3.0 RESULTS

### 3.1 VANTAGE POINT

A total of 36 hours of vantage point watching was completed from each vantage point VP1 to VP4 during the October to March vantage point surveys.

A total of 8 target species were recorded during the 2024-2025 non-breeding season vantage point surveys. These species (BTO Code in parenthesis) and their current conservation status are as follows:

**Buzzard (BZ):** conservation status = Green Low conservation concern

**Grey Heron (H.):** conservation status = Green Low conservation concern

**Hen Harrier (HH):** conservation status = Amber (Breeding) Medium conservation concern

**Kestrel (K.):** conservation status = Red (Breeding) High conservation concern

**Lesser Black-Backed Gull (LB):** conservation status - Amber (Breeding and Wintering)  
Medium conservation concern

**Mallard (MA):** conservation status = Amber (Breeding and Wintering) Medium conservation  
concern

**Sparrowhawk (SH):** conservation status = Green Low conservation concern

**Whooper Swan (Whooper Swan):** conservation status = Amber (Breeding and Wintering)  
Medium conservation concern

Of the bird species recorded Hen Harrier and Whooper Swan are listed on Annex 1 of the EC Birds Directive.

A total of 48 flights by target species were recorded during the 2024-2025 non-breeding season. **Figure 3.1** shows all flights observed during the vantage point surveys. The percentage breakdown of flights recorded per species are set out in Table 3.1 below.

**Table 3.1: Vantage Point Flight lines recorded during the 2024/2025 Non-Breeding season**

Species	No. Flights	Percentage Flights
Buzzard	19	40%
Grey Heron	5	10%

Species	No. Flights	Percentage Flights
Hen Harrier	1	2%
Kestrel	7	15%
Lesser Black-backed Gull	2	4%
Mallard	9	19%
Sparrowhawk	3	6%
Whooper Swan	2	4%

A summary of the observations for each target species is provided in the following subsections.

### 3.1.1 Buzzard

A total of 19 Buzzard flights were observed during the non-breeding season. The number of birds recorded during these flight observations was dominated by single bird flights (15 of 19). One flight of 2 no. birds and three flights of 3 no. birds were recorded. This species was typically recorded flying within the <20m and 20 to 200m height band, with one flight being recorded at higher elevation at >200m.

The range of activity recorded during flights included hunting, commuting, soaring, being mobbed by hooded crows; landing to perch on trees.

**Figure 3.2** shows all Buzzard flights observed during the 2024-2025 non-breeding season.

### **3.1.2 Grey Heron**

A total of 5 Grey Heron flights were observed during the non-breeding season. All flights were observed flying low at <50m for short durations (<45 seconds). All flights observed were of individual herons.

**Figure 3.3** shows the Grey Heron flight observed during the 2024-2025 non-breeding season.

### **3.1.3 Hen Harrier**

One no. daytime Hen Harrier flight was observed from VP2 during the non-breeding season, comprising one ringtail during October (at 13:06). The flight was representative of a foraging bout at low altitude close to the ground. The flights were observed for short durations at less than 30 seconds.

**Figure 3.4** shows the Hen Harrier flight observed during the 2024-2025 non-breeding season.

### **3.1.4 Kestrel**

A total of 7 flights of Kestrel was observed during the non-breeding season vantage point surveys. All observations were of an individual kestrel. The majority of the Kestrel flights were observed at low height at <50m. All flights were of a duration of less than 105 seconds.

**Figure 3.5** shows all Kestrel flights observed during the 2024-2025 non-breeding season.

### **3.1.5 Lesser Black-backed Gull**

Two no. Lesser Black-backed Gull flights were observed during the non-breeding season. The first flight recorded from VP1 during November was of one individual gull commuting, whilst the second flight, recorded from VP4 during February was of a pair of gulls. Both flights were observed for short durations at less than 45 seconds at heights of c. 30m.

**Figure 3.6** shows the Lesser Black-backed Gull flights observed during the 2024-2025 non-breeding season.

### **3.1.6 Mallard**

A total of 9 no. Mallard flights were recorded during the non-breeding season. Flights were recorded at low height at <40m (8 of 9) and less than 100m (1 of 9) with all flights being of a duration of 15 seconds to 45 seconds. Four of the observed flights were of single and pairs of gulls respectively, whilst the remaining flight was of a small flock of 5 no. birds.

**Figure 3.7** shows the Mallard flights observed during the 2024-2025 non-breeding season.

### **3.1.7 Sparrowhawk**

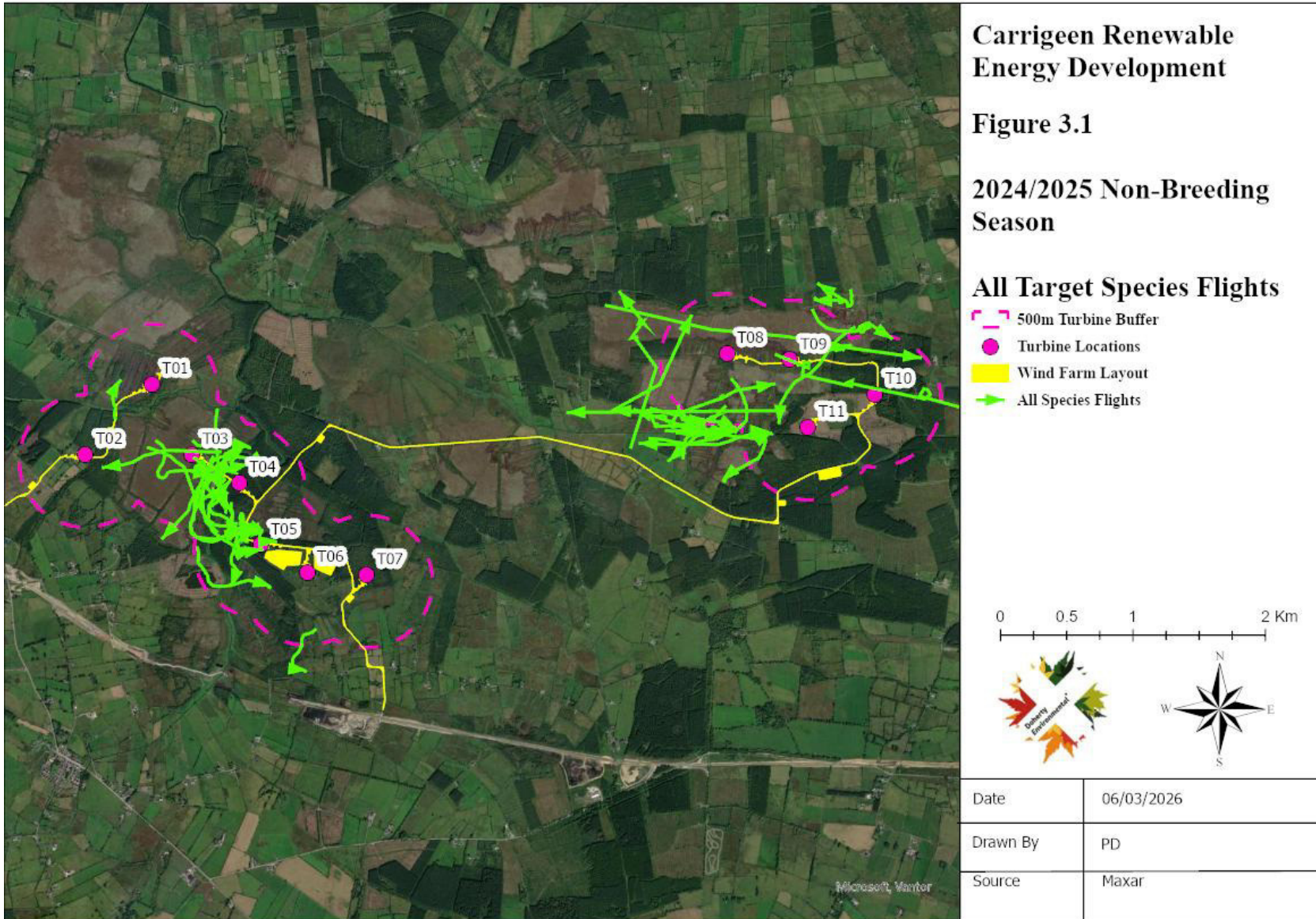
Three flights of a Sparrowhawk were recorded during the 2024/2025 non-breeding season. All three flights were recorded of an individual Sparrowhawk hunting low over the ground along the Breedoge River. Each flight was of short duration at <15 seconds.

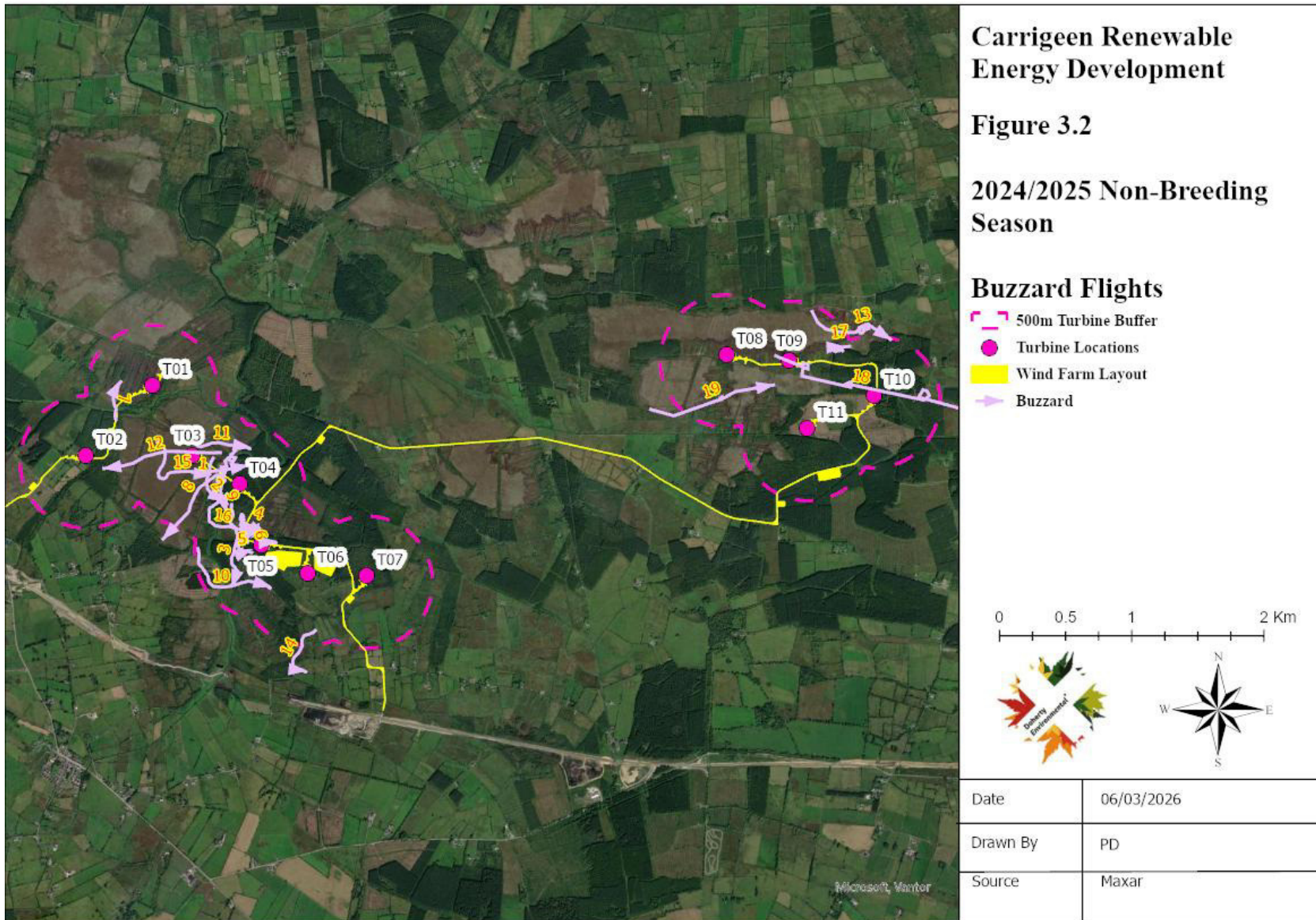
**Figure 3.8** shows the Sparrowhawk flights observed during the 2024-2025 non-breeding season.

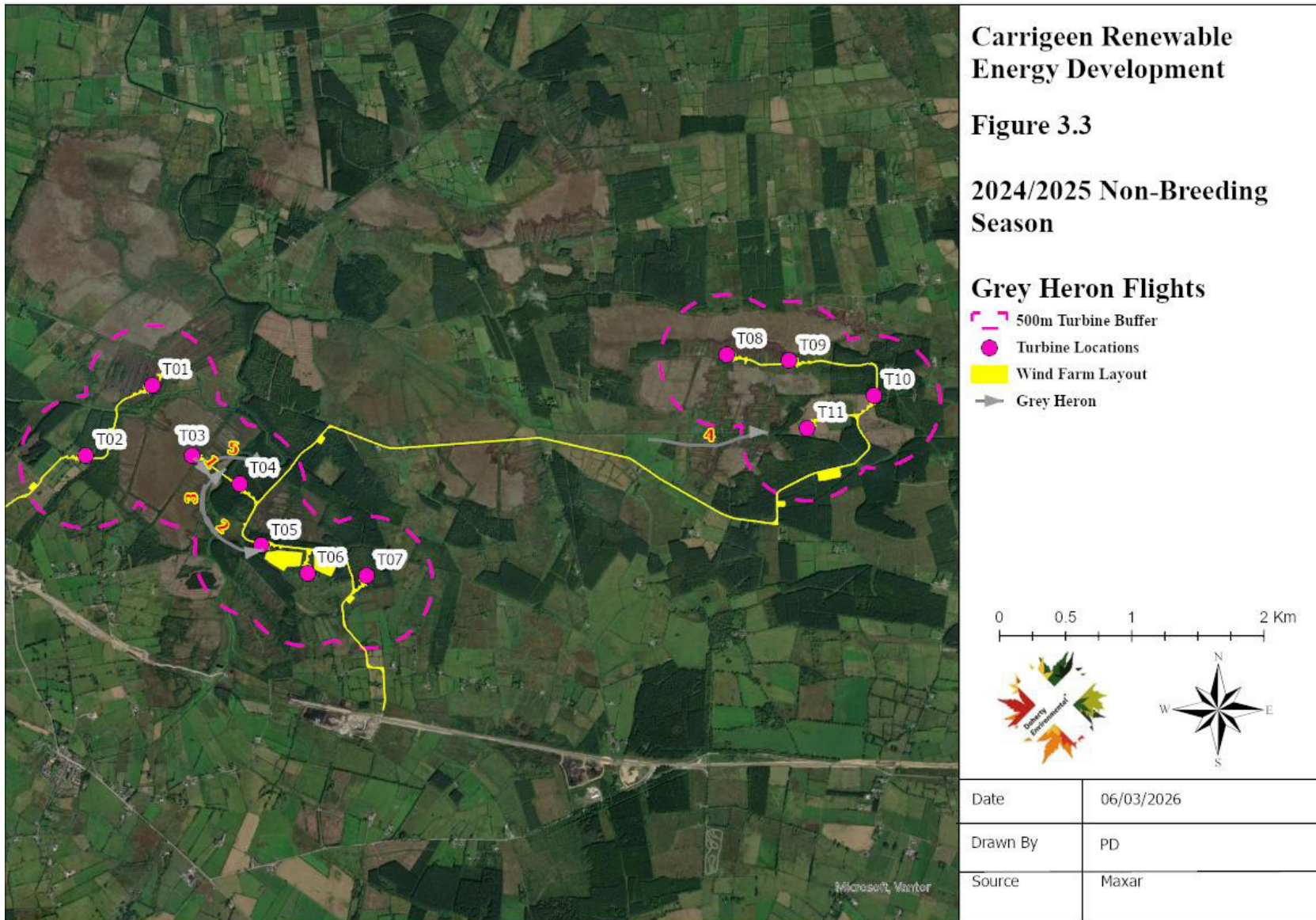
### **3.1.8 Whooper Swan**

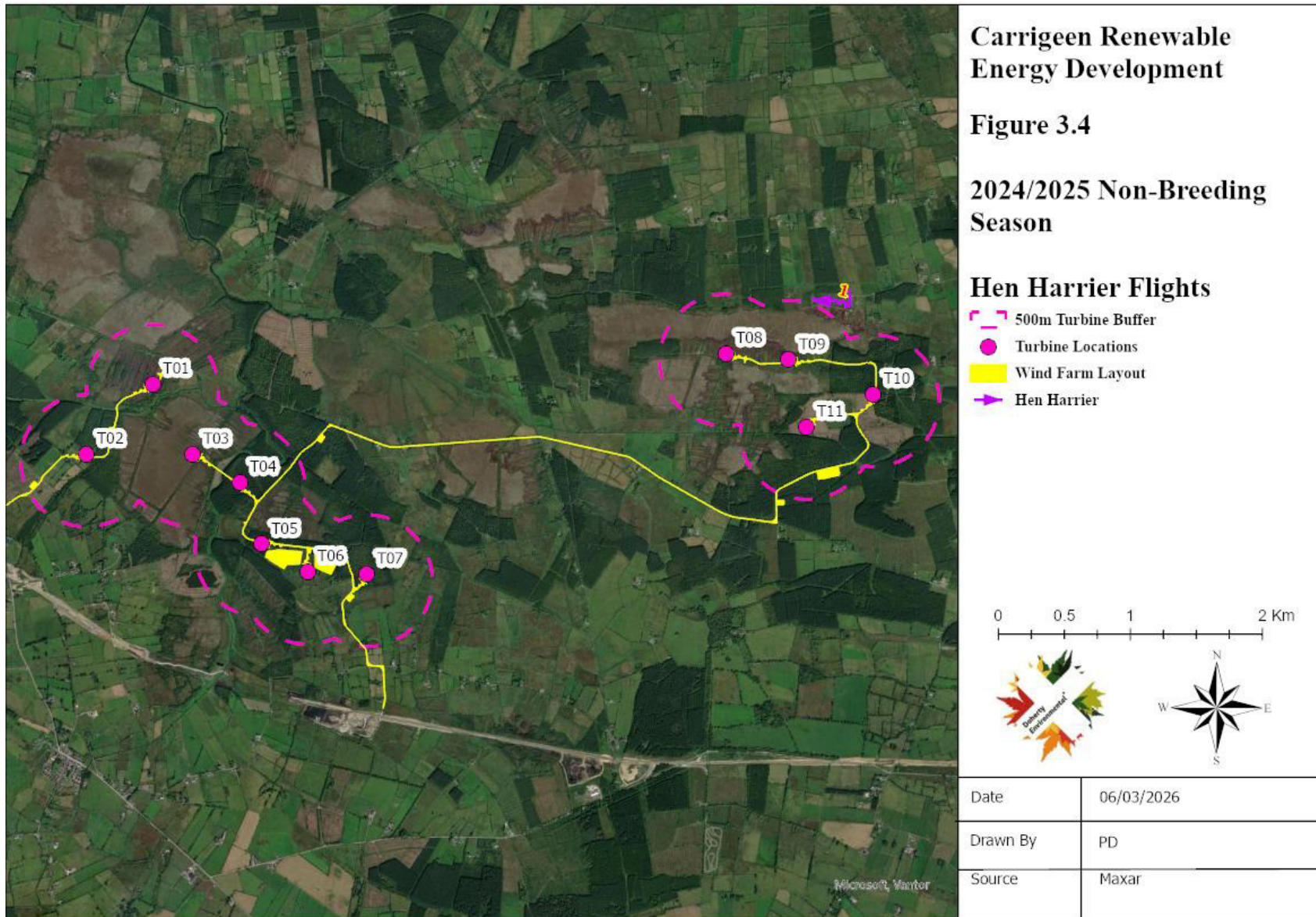
Two Whooper Swan flights were recorded during the 2024/2025 non-breeding season. The first was recorded from VP2 during November and was of a small flock of Whooper Swan (No. = 10) flying from west to east to the north of the proposed turbines T08 and T09. The second flight was recorded from VP1 during December was of a pair of Whooper Swans. Both flights were of birds flying a significant height at >200m elevation.

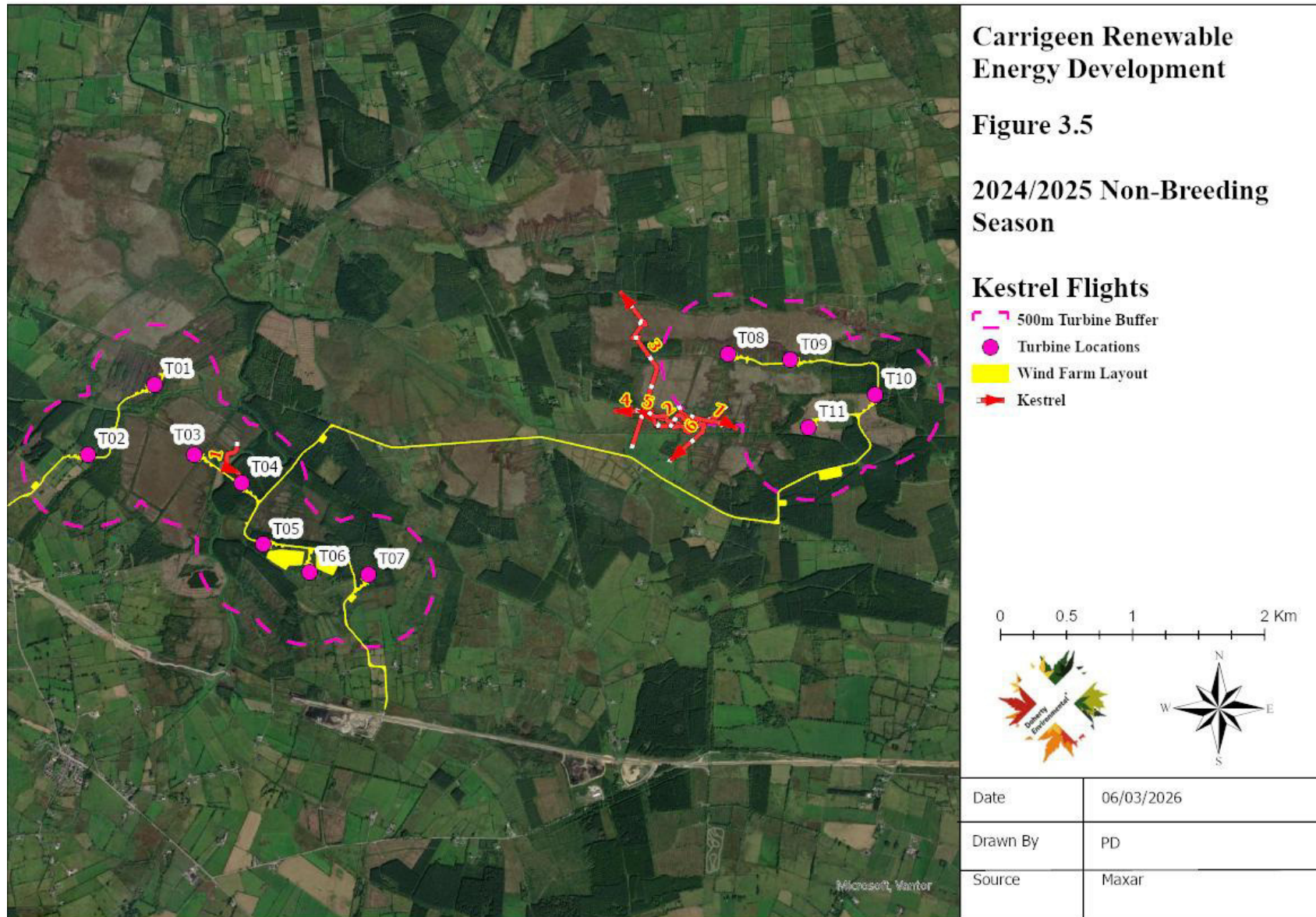
**Figure 3.9** shows the Whooper Swan flights observed during the non-breeding season.

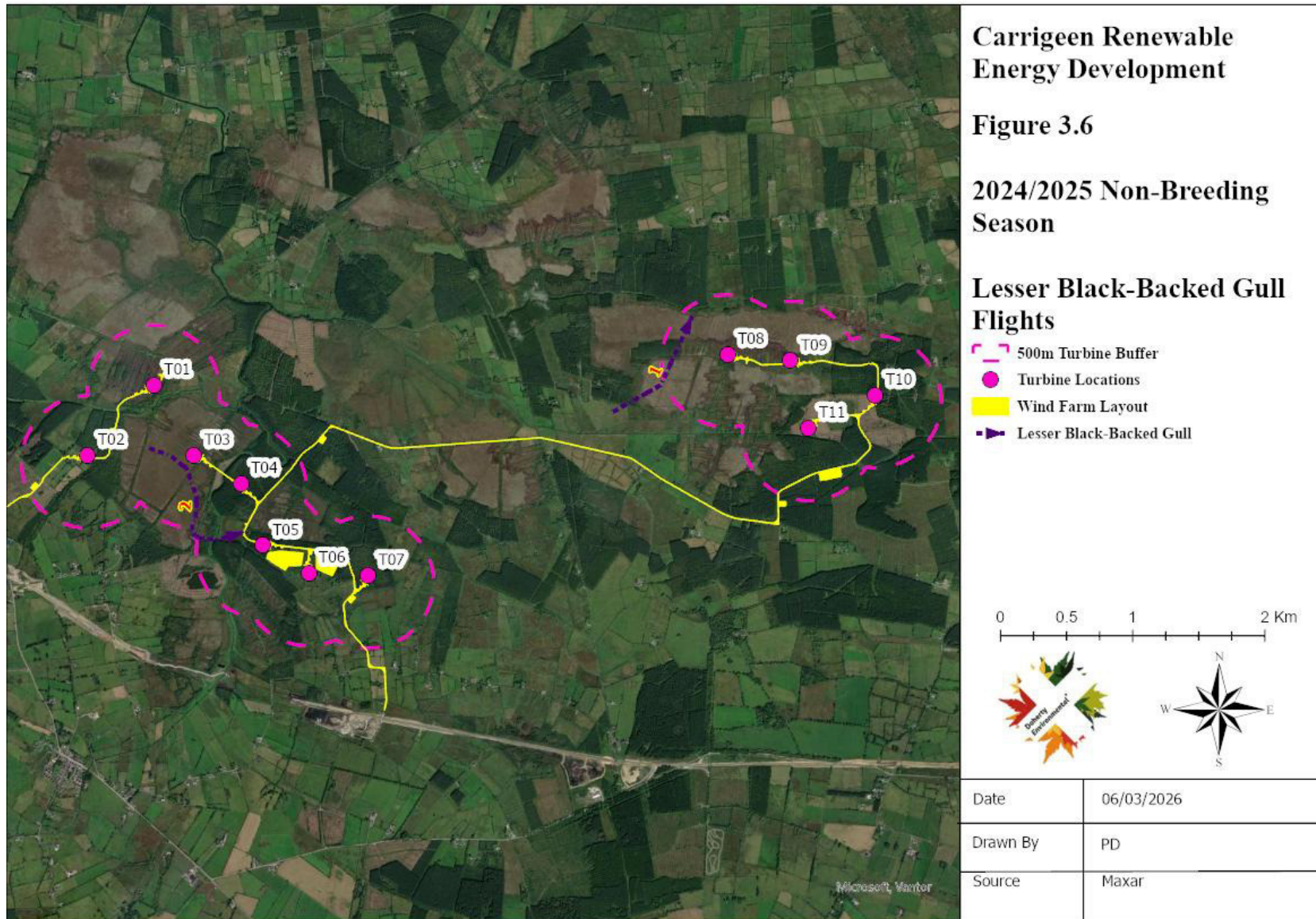


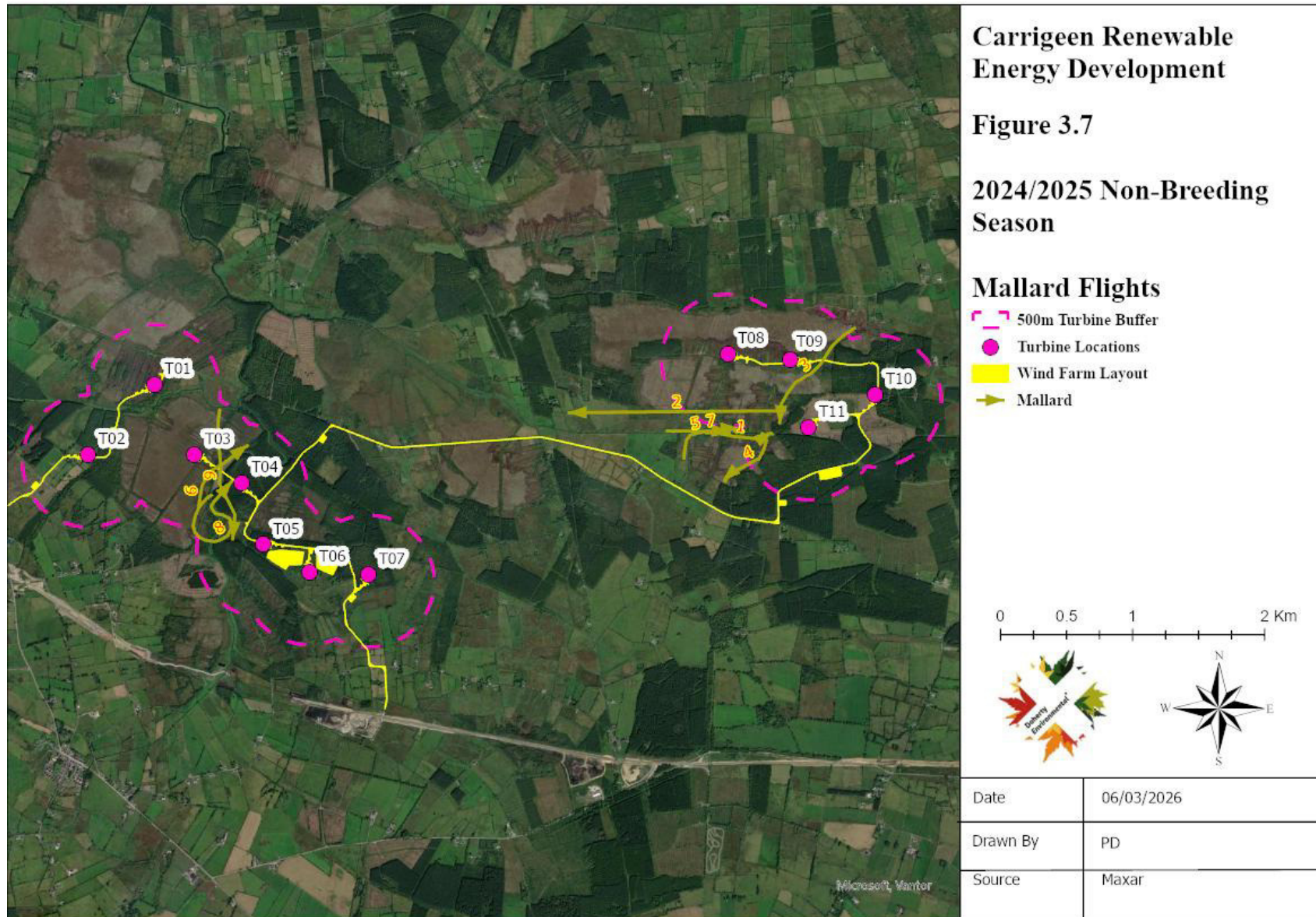


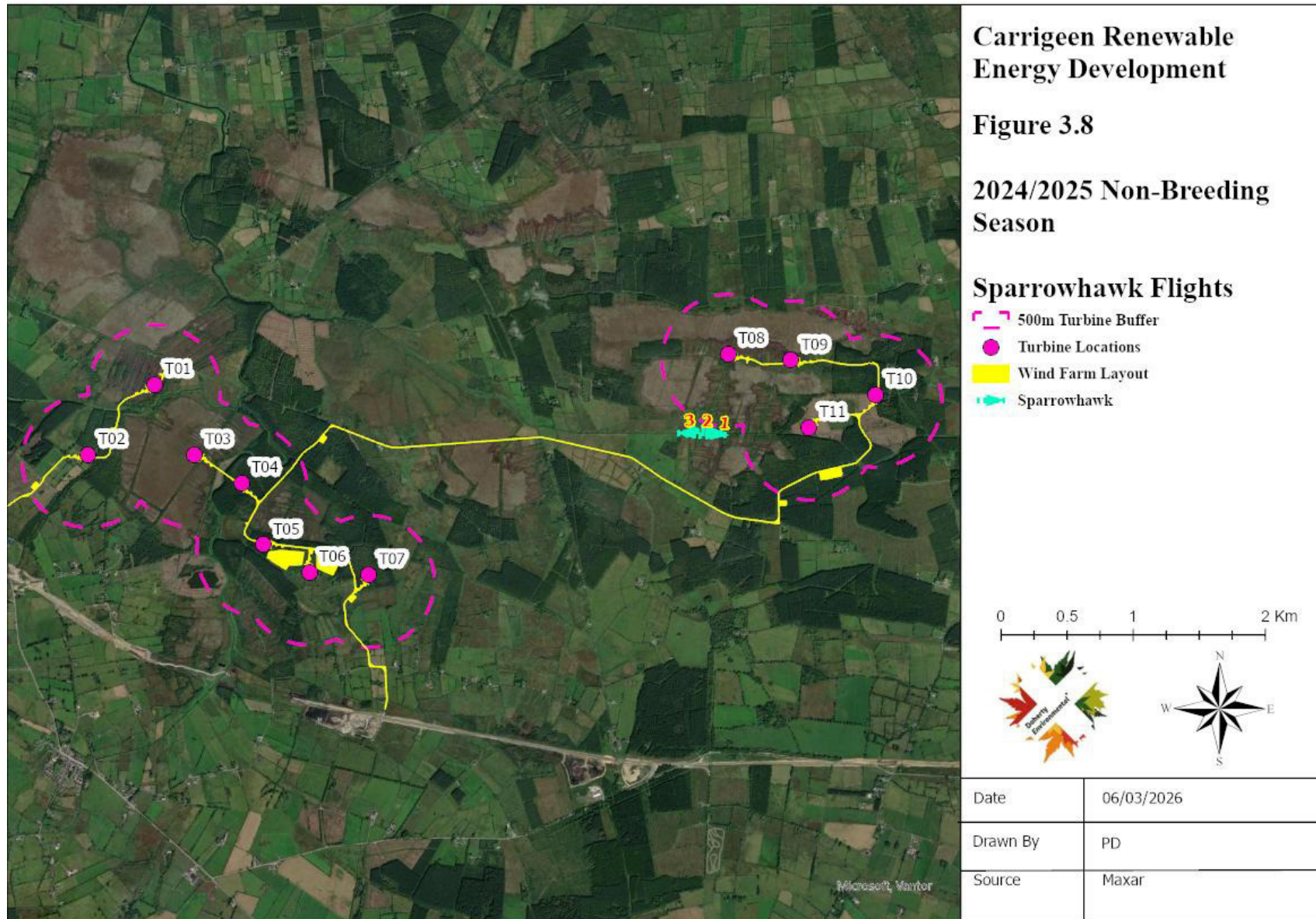


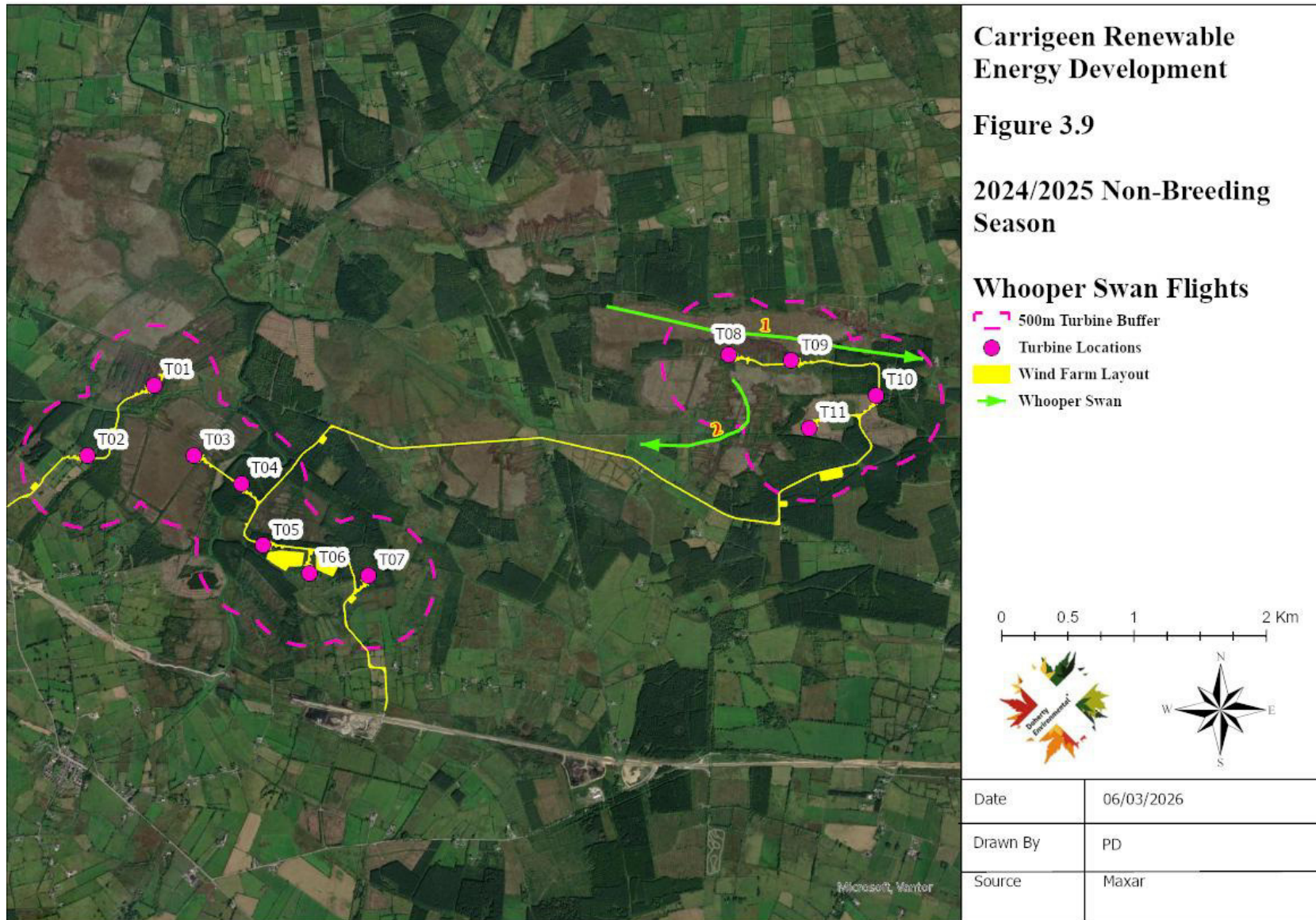












### 3.2 TRANSECT SURVEYS

The results of the transect surveys completed between October and March are provided in Table 3.2 below. A total of 46 species were recorded during the non-breeding season transect surveys. The majority of the species recorded are of low conservation concern (Green-listed species). Eight species of medium conservation concern (Amber-listed species) were recorded. These are Goldcrest, Greenfinch, Hen Harrier, Linnet, Mallard, Skylark, Starling and Willow Warbler. Four species of high conservation concern (Red-Listed Species), namely Kestrel, Meadow Pipit, Red Wing and Snipe were recorded during the survey. Kestrel was recorded along transect 1 and 11. Meadow Pipit was recorded from all transects with the exception of Transect 2 and 3; and 11. Redwing was observed along transect T1 and T7. Snipe was recorded along Transect 1; 3; 4; 6; 7; 9; 10 and 11.

**Table 3.2: Transect Survey Results**

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3`			Transect 4			Transect 5			Transect 6`		
			14/11	29/12	15/02	14/11	23/01	15/02	14/11	29/12	23/01	14/11	29/12	15/02	13/11	28/12	23/01	13/11	28/12	23/01
Blackbird	Green	No				1						1	1	2	1	2	2	1		1
Blackcap	Green	No									2									
Blue Tit	Green	No					2	1			1		2		1	1				
Bullfinch	Green	No																		
Buzzard	Green	No												1						
Chaffinch	Green	No										2	3	1	5	3	4	2		1
Chiffchaff	Green	No																		
Coal Tit	Green	No											1			1	1			
Crossbill	Green	No													10	2				
Cuckoo	Green	No																		
Dunnock	Green	No				1		1				1								
Fieldfare	Green	No												2						
Goldcrest	Amber	No				2		1			1				2	1	2			
Goldfinch	Green	No				16	8		12		2									
Great Tit	Green	No	2	3											1	2	2	3	3	
Greenfinch	Amber	No																		
Grey Heron	Green	No																		
Hen Harrier	Amber	Yes																		
Hooded Crow	Green	No											2	1				4	1	6
House Martin	Amber	No																		
House Sparrow	Amber	No																		
Jay	Green	No								1		1			1					
Jackdaw	Green	No																		
Kestrel	Red	No		1																

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3`			Transect 4			Transect 5			Transect 6`		
			14/11	29/12	15/02	14/11	23/01	15/02	14/11	29/12	23/01	14/11	29/12	15/02	13/11	28/12	23/01	13/11	28/12	23/01
Lesser Black-backed Gull	Amber	No																		
Lesser Redpoll	Green	No							1		3			1					1	
Linnet	Amber	No	1						1	1								1		1
Long-tailed Tit	Green	No	1				1	2					4					2		
Magpie	Green	No	1			1				2										
Mallard	Amber	No																		
Meadow Pipit	Red	No	5	3	1							3	1	2	1	1		2	3	
Mistle Thrush	Green	No	1																	
Pheasant	Green	No								1		1		1			1			
Pied Wagtail	Green	No	2	1								1								
Raven	Green	No				2					2									
Red Wing	Red	No				5					5									
Reed Bunting	Green	No																		
Robin	Green	No	2		3			3	2		1	1	3	1	2	1	1		1	
Rook	Green	No		23								1		4	2	2	1		14	2
Siskin	Green	No		2							1		1							
Skylark	Amber	No	3	3	8				2	2	3	1	3	4		1	2			
Snipe	Red	No	8									3	4	1		1		2	2	1
Song Thrush	Green	No	2								1	3								
Sparrowhawk	Green	No																		
Starling	Amber	No	10						2											
Stonechat	Green	No		1					1	1				2		1	1			
Swallow	Amber	No		2	9															
Teal	Amber	No																		
Treecreeper	Green	No														1				
Whitethroat	Green	No																		

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3`			Transect 4			Transect 5			Transect 6`		
			14/11	29/12	15/02	14/11	23/01	15/02	14/11	29/12	23/01	14/11	29/12	15/02	13/11	28/12	23/01	13/11	28/12	23/01
Willow Warbler	Amber	No										1		2		1	3			
Woodpigeon	Green	No	4				1	1		5		3		3	3	2	2	1	1	
Wren	Green	No	1	2	1	1	3		4	3	1	2		1	1	1	2		1	1

Species	BoCCI	Annex 1	Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			13/11	28/12	23/01	16/11	30/12	22/01	16/11	30/12	22/01	16/11	30/12	22/01	16/11	30/12	22/01
Blackbird	Green	No		1		2	1				1	1	1				
Blackcap	Green	No															
Blue Tit	Green	No		2	1		1	2				1	1				
Bullfinch	Green	No		1					1	1	1						
Buzzard	Green	No		1												1	
Chaffinch	Green	No	4	5	6	1	2	2				2	1			3	
Chiffchaff	Green	No							3		2						
Coal Tit	Green	No	4	4	2	1		1				1					
Crossbill	Green	No		4	11	2	1		1	1	3	4	2				
Cuckoo	Green	No	1							2							
Duncock	Green	No					2										
Fieldfare	Green	No	21	8													
Goldcrest	Amber	No	4		4			2					3				
Goldfinch	Green	No				1			2	2							
Great Tit	Green	No		5		1	2	1				2	1	2		1	
Greenfinch	Amber	No							3	3	1			2			
Grey Heron	Green	No															
Hen Harrier	Amber	Yes								1							

Species	BoCCI	Annex 1	Transect 7			Transect 8			Transect 9			Transect 10			Transect 11		
			13/11	28/12	23/01	16/11	30/12	22/01	16/11	30/12	22/01	16/11	30/12	22/01	16/11	30/12	22/01
Hooded Crow	Green	No	3	2		4	3		2	2		8	1		5	3	2
House Martin	Amber	No															
House Sparrow	Amber	No															
Jay	Green	No				1		1									
Jackdaw	Green	No	5		14					5			4	3			
Kestrel	Red	No															1
Lesser Black-backed Gull	Amber	No															
Lesser Redpoll	Green	No	1				1			1		1				1	1
Linnet	Amber	No				6	1		1	1	1	1		1			
Long-tailed Tit	Green	No	4	12	2	8	2			12		1		1			
Magpie	Green	No	3		1	1		1									1
Mallard	Amber	No	2				2		1		3						
Meadow Pipit	Red	No	1			1	2	2	5	3	3	1	2	2			2
Mistle Thrush	Green	No				5						1					
Pheasant	Green	No															
Pied Wagtail	Green	No		1	2										1		1
Raven	Green	No				1			2	2		2		1			
Red Wing	Red	No	14	8						4							
Reed Bunting	Green	No															1
Robin	Green	No		1		1	1	2	2	2	3		1	1	4	4	2
Rook	Green	No						1	2	4	3						
Siskin	Green	No	1														1
Skylark	Amber	No		1				2	2		2	1					1
Snipe	Red	No	2	1	2				5		6	4	3	6	11	6	
Song Thrush	Green	No															
Sparrowhawk	Green	No															

Species	BoCCI	Annex 1	Transect 7			Treansect 8			Transect 9			Transect 10			Treansect 11		
			13/11	28/12	23/01	16/11	30/12	22/01	16/11	30/12	22/01	16/11	30/12	22/01	16/11	30/12	22/01
Starling	Amber	No							6						4		
Stonechat	Green	No	1			1	2						1				1
Swallow	Amber	No															
Teal	Amber	No															
Treecreeper	Green	No															
Whitethroat	Green	No															
Willow Warbler	Amber	No							2	2		1					
Woodpigeon	Green	No	2		3	2	2		2	5				1			1
Wren	Green	No	2	1		2	2	1	4	2	3	1		1	4		2

### 3.3 HINTERLAND VANTAGE POINT SURVEYS

A total of four no. species and 13 no. flight observations were recorded during the 2024/2025 non-breeding season hinterland vantage point surveys. These comprise Buzzard, Grey Heron, Kestrel and Mallard. The flights observed were comprised of the follows:

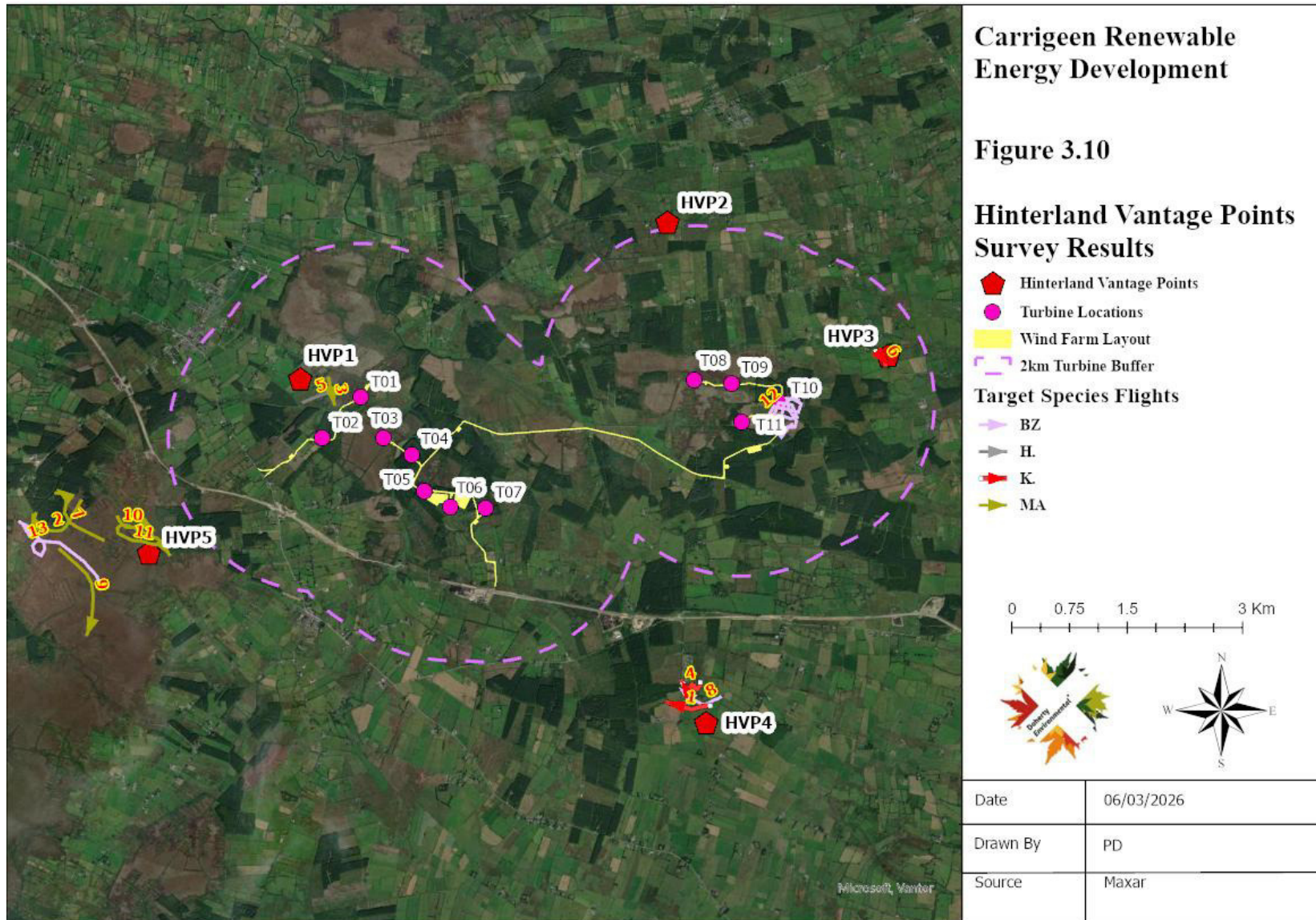
Three no. flights of individual Buzzard from HVP3, 4 and 5;

One no. Grey Heron flight was recorded during a hinterland vantage point watch at HVP1 during November;

Three no. Kestrel flights were recorded from HVP3 and 4; and

Six no. Mallard flights were recorded from HVP1 and 5. Four of the flights observed were of pairs of Mallard whilst one flight from observed from HVP5 was of three Mallards.

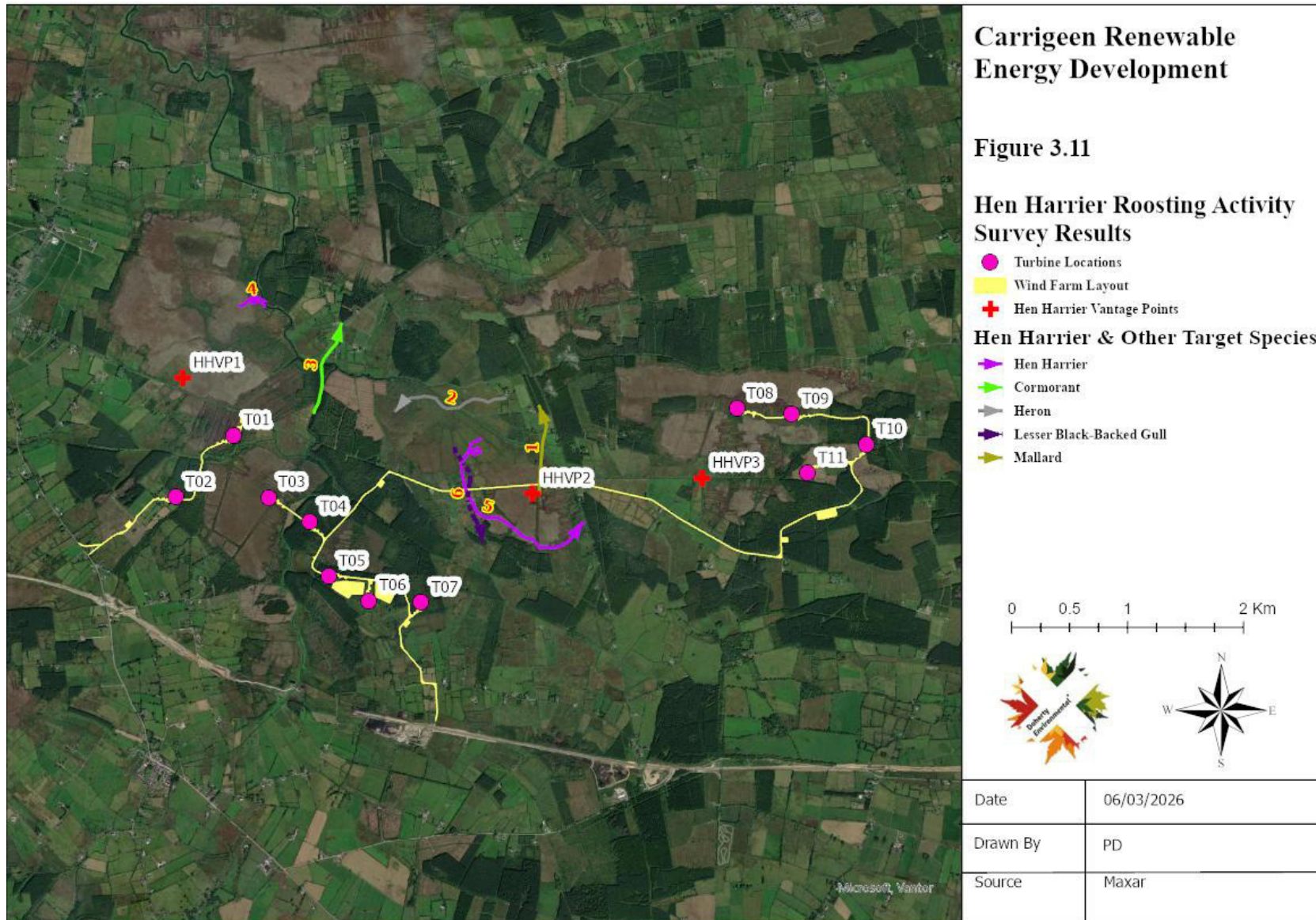
The flight lines recorded for these species during the hinterland vantage point surveys are shown on **Figure 3.10**.



### 3.4 HEN HARRIER WINTER ROOST SURVEYS

During the Hen Harrier winter roost surveys 2 no. Hen Harrier flights were recorded. The first was recorded from HHVP1 during an evening survey completed on the 18<sup>th</sup> November 2024. This was of a ringtail flying low over forestry and then descending lower over northeastern side of Cloonashanville Bog. The flight was registered at 16:29 coinciding with end of day activity and flight to roost. Whilst the Hen Harrier was not observed dropping to ground the timing of the flight suggests likely roosting within Cloonashanville Bog SAC to the north of the wind farm western parcel. The second flight was of a ringtail, observed from HHVP2 flying from north to south of bog habitat. The flight was recorded at sunrise at 08:45 at a height of c. 40m dropping to <30m. The ringtail was not observed rising from the ground out of a roost but the timing of the flight at sunrise suggests that this Hen Harrier roosted in the vicinity to the north of the flight line. **Figure 3.11** shows the Hen Harrier flight recorded during the 2024/2025 survey.

Aside from Hen Harrier, the other target species recorded during the Hen Harrier roosting activity surveys comprised individual flights of Cormorant; Grey Heron; Lesser Black-backed Gull and Mallard. These flights are shown on **Figure 3.11** below.



## 4.0 CONCLUSION

During the 2024/2025 non-breeding season vantage point surveys were completed for the Project.

During the vantage point surveys a total of 48 flightlines were recorded comprising 8 no. target species. The activity recorded during the vantage point surveys was dominated by Buzzard accounting for c. 40% of all flight activity recorded. Low levels of flight activity for all other target species were recorded.

A total of 4 red-listed species of high conservation concern (Kestrel, Meadow Pipit, Red Wing & Snipe) and 13 amber-listed species of amber conservation concern were recorded during the 2024/2025 non-breeding season transect surveys.

Hen Harrier and Whooper Swan represent the bird species that is listed on Annex 1 of the EC Birds Directive recorded during the non-breeding season surveys. A total of 4 observations of Hen Harrier were recorded during the non-breeding season, with 1 being recorded during vantage point surveys; 2 recorded during roosting activity surveys and 1 during transect surveys. The timing of the roosting activity survey observations indicates the use of habitat in the wider vicinity of the Wind Farm Site for roosting by Hen Harrier. Given the vantage point, hinterland vantage point and roosting activity surveys completed coinciding with roosting times it is considered that Hen Harrier roosting activity in bog habitat to the north of the Wind Farm Site is representative of casual/opportunistic roosting by lone Hen Harriers.

Whooper swan flight activity was low during the non-breeding season with a total of 2 no. observations recorded during all surveys. The results indicate that absence of any regularly flightpaths by Whooper Swans in the vicinity of the Wind Farm Site.



Carrigeen Renewable Energy  
Development

Bird Survey Report

2025 Breeding season

Doherty Environmental Consultants Ltd.

March 2026

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

This report has been prepared by Doherty Environmental Consultants (DEC) Ltd with all reasonable skill, care and diligence. Information report herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is prepared for Carraigin Power Ltd. and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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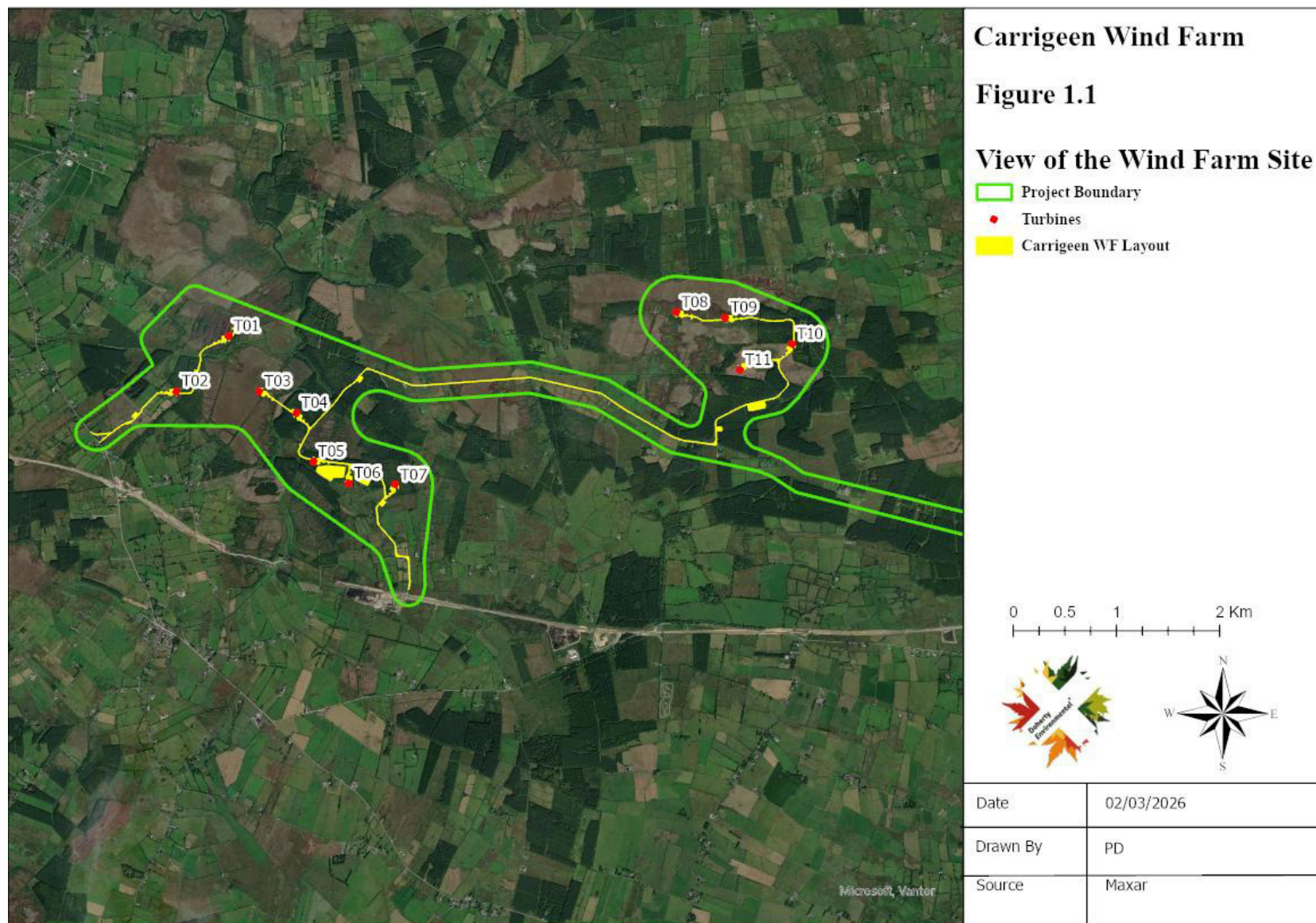
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## **1.0 INTRODUCTION**

Doherty Environmental Consultants (DEC) Ltd have been contracted to carry out ornithological surveys on behalf of Carragain Power Ltd. for the proposed Carrigeen Renewable Energy Development, Co. Roscommon, which consists of a Wind Farm Site, a Grid Connection, and Turbine Delivery Route (altogether the Project). An aerial view of the Wind Farm Site is shown on Figure 1.1.

Surveys commenced at the Wind Fram Site in late March 2022. This report provides details of the surveys completed during the 2025 breeding season (April to September 2025). The 2025 breeding season represents the fourth round of breeding season ornithological surveys completed for the proposed Project.

The surveys have been undertaken in order to provide a baseline environmental data set, which will be incorporated into the Environmental Impact Assessment (EIA) for the project as required under EU EIA Directive (Council Directive 2011/92/EU, amended in 2014/52/EU).



## 2.0 METHODOLOGY

### 2.1 VANTAGE POINT SURVEYS

The primary objective of the bird surveys completed for the proposed Project is to:

- Establish the presence and behaviour of raptors, waterbirds and other bird species known to be sensitive to collision with wind turbines over the Wind Farm Site;
- Obtain data on the movements of target species which would facilitate an analysis of foraging activity and collision risk;
- Identify any flight paths used by overwintering waterfowl.

The bird surveys involved vantage point surveys of the buildable area. The methodology adopted for the 2025 breeding season vantage point surveys was derived from the NatureScot *Recommended bird survey methods to inform impact assessment of onshore wind farms (2025)*. NatureScot guidance for surveys at wind farms recommend that field surveys focus on those species of high nature conservation value for which there is potential for impacts to occur. These target species in Ireland are derived from the following sources:

- Special conservation interest (SCI) bird species of the Special Protection Areas (SPAs) that occur within the zone of influence of a project; and
- those species that are of medium (amber) and high (red) conservation concern (i.e. Red Listed species).

Where species that are included under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;

- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >200m; 20m to 200m; and <20m<sup>1</sup>; and
- The behaviour of the target species.

NatureScot guidance (2025) outlines specific survey methodologies for onshore wind farm developments. These guidelines recommend that vantage point surveys should be completed across all calendar months when the species is present or likely to be so.

Four vantage points (**VP1** to **VP4**) were used for monitoring of the proposed Wind Farm Site and surrounding area. The location of these vantage points are shown on **Figure 2.1**.

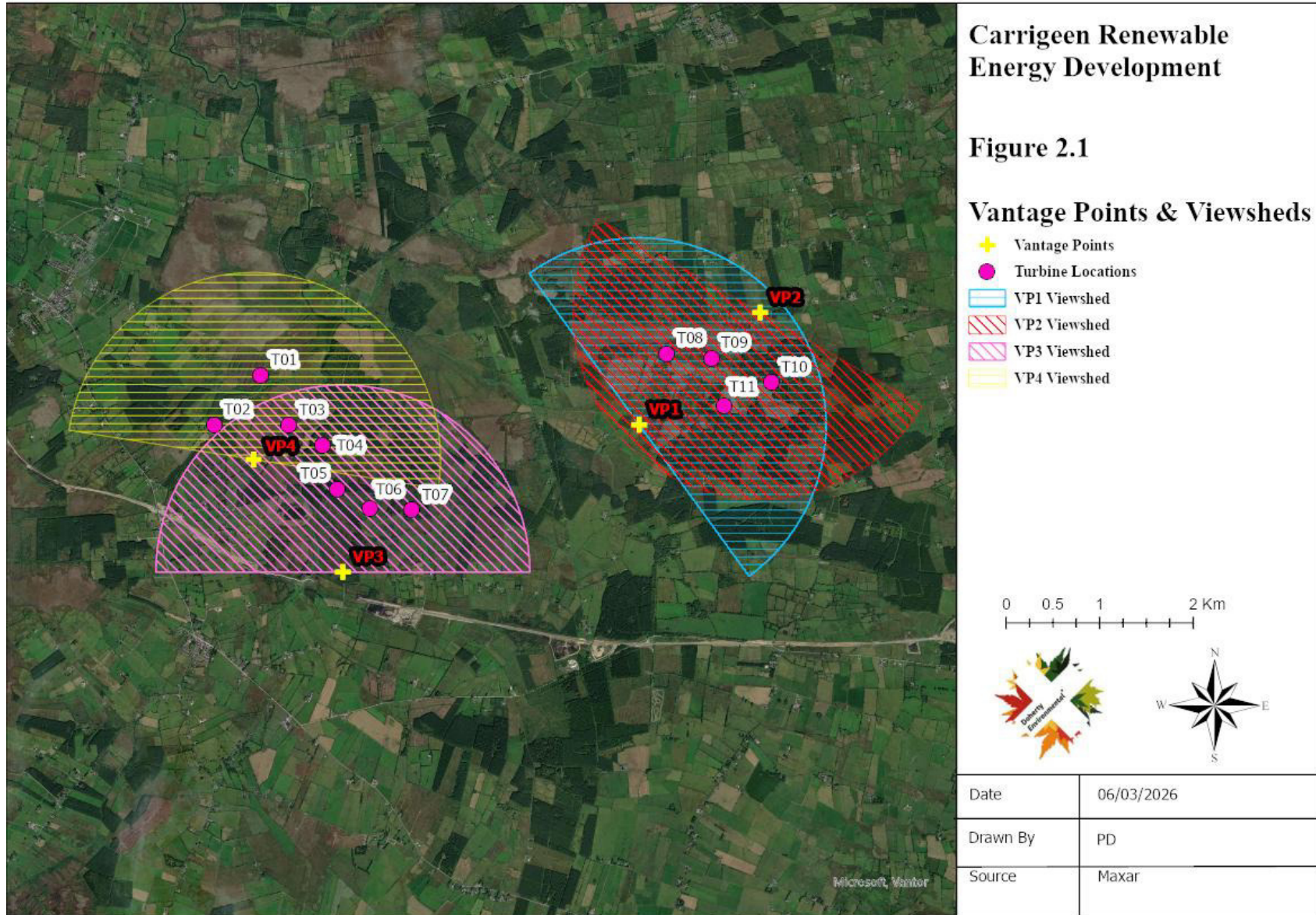
The vantage points were selected following a viewshed analysis of the proposed Wind Farm Site and a 500m buffer area surrounding the Wind Farm Site. The viewshed analysis was completed using QGIS software and is based on an observer height of 1.6m and an observable viewshed from the observer point at a height of 20m. The viewshed afforded from VP1 and VP4 is shown on **Figure 2.1**.

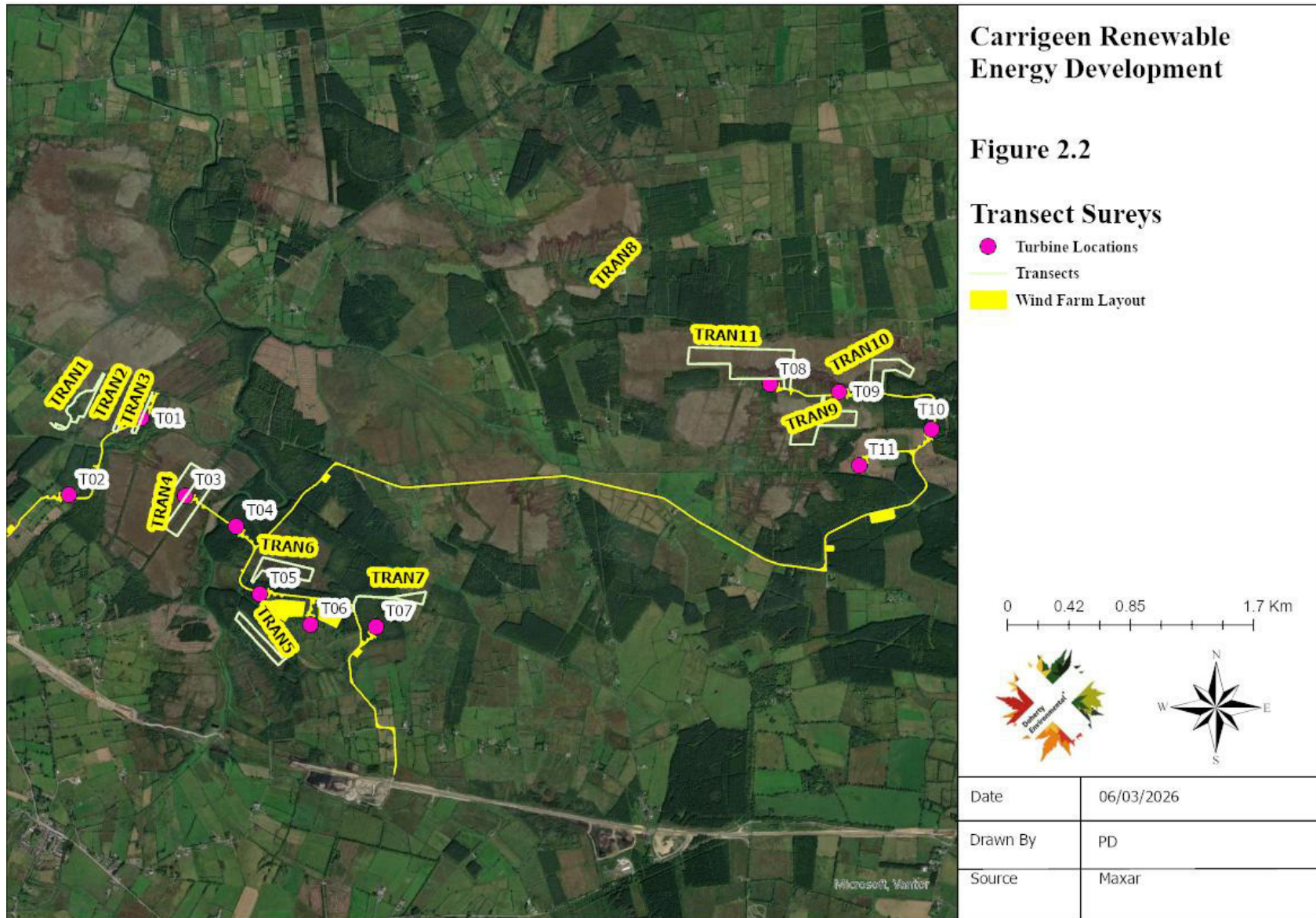
Surveys during the 2025 breeding season commenced in April 2025 and continued monthly until September 2025.

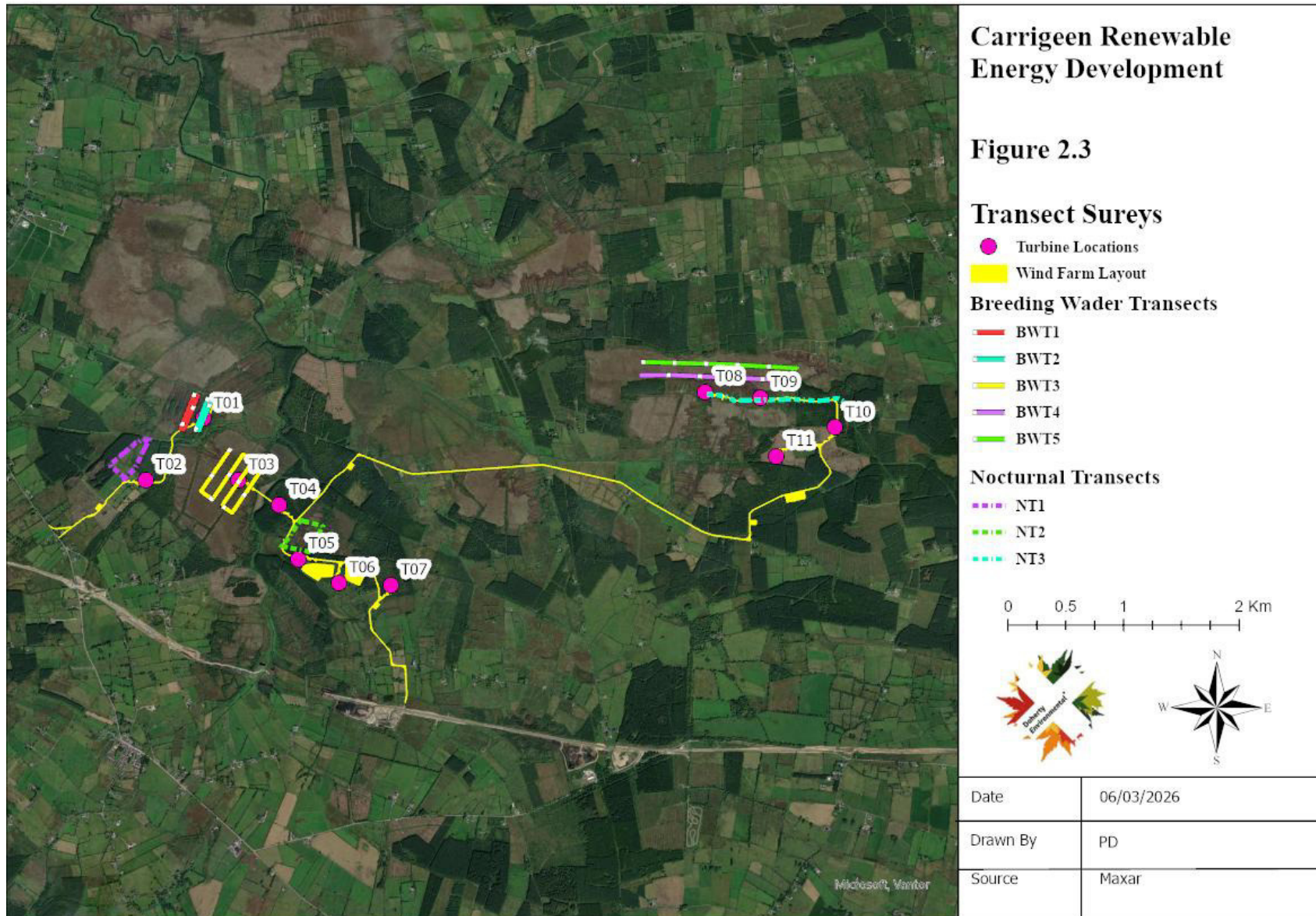
A minimum of 36 hours surveying was completed at all vantage point locations during the breeding season between April and September 2025. The vantage point surveys were completed by undertaking two watches of a duration of 3 hours from each point per month.

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<sup>1</sup> The flight bands are based on the minimum and maximum height (i.e. 22m and 185m respectively) of the rotor blade sweep of typical commercial wind turbines.







## 2.2 BREEDING SEASON TRANSECT SURVEYS

Breeding season transect surveys were completed to record the bird assemblages occurring at the proposed Wind Farm Site. A total of 11 no. transects were completed during the 2025 breeding season. The location and extent of each transect is shown on **Figure 2.2**.

The methodology used was a combination of the Brown and Shepherd (1993), Moorland Bird Survey (MBS) and Common Bird Census techniques. Surveys were undertaken in suitable weather conditions, avoiding times of heavy and persistent rain and strong winds.

Each transect was walked at a steady slow walking speed and all birds seen and heard were recorded. Visual observations of birds were aided by the use of binoculars. The species and number of birds occurring along transects were recorded so that the species assemblage and associated abundance along each transect could be established.

## 2.3 HINTERLAND VANTAGE POINT SURVEYS

Hinterland surveys have been completed for 5 no. hinterland vantage point survey locations (HVP1; HVP2; HVP3; HVP4; and HVP5) in the wider area surrounding the Wind Farm Site. The location of the hinterland surveys and the associated viewshed are shown on **Figure 3.9**. The hinterland survey points were primarily used to survey for the presence of breeding and/or wintering raptors within the wider 2km area surrounding the proposed Wind Farm Site. The surveys were completed in accordance with Hardey et al. (2013). Activity associated with all other target species, as specified in Section 2.1 above was also recorded during the hinterland surveys. The data collection method during the hinterland surveys followed that described for the vantage point surveys at 2.1 above. During the breeding season the hinterland surveys were completed at various times throughout the day.

Each of the hinterland survey points were selected for the views afforded from these points providing coverage of semi-natural habitat with potential to function as roost or breeding sites for raptors as well as the expansive coverage of the surrounding area.:

- HVP 1 is located to the west of the Wind Farm Site and provides a view over an expanse of wetland habitat occurring to the west of the Wind Farm Site.
- HVP2 is located to the north of the Wind Farm Site and provides a view over the raised bog habitat at Cloonshanville Bog.

- HVP3 is located to the north of the proposed Wind Farm Site and provides a view looking south toward the Wind Farm Site over areas of wetland habitat.
- HVP4 is located to the east of the Wind Farm Site and provides an expansive view looking west over the Wind Farm Site.
- HVP5 is located to the south of the Wind Farm Site and provides an expansive view looking north towards the Wwind Farm Site over unimproved wet grassland fields.

## 2.4 NOCTURNAL SURVEYS

Nocturnal surveys for bird species that are active at night, such as woodcock and nightjar were completed during the 2025 breeding season. Surveys were completed during April, May and June of 2025. The survey method involved walking transects along the edge of conifer plantation habitat. The transects are shown on **Figure 2.3**.

The aim of the survey was to record the location of any woodcock, nightjar or other less commonly occurring species, not recorded during daytime transect surveys. Any such species seen or heard during the transect surveys were recorded using ArcGIS Field Maps.

## 3.0 RESULTS

### 3.1 VANTAGE POINT

A total of 36 hours of vantage point watching was completed from each vantage point VP1 to VP4 during the April to September vantage point surveys.

A total of 7 target species were recorded during the breeding season vantage point surveys. These species (BTO Code in parenthesis) and their current conservation status are as follows:

**Buzzard (BZ):** conservation status = Green Low conservation concern

**Grey Heron (H.):** conservation status = Green Low conservation concern

**Kestrel (K.):** conservation status = Red (Breeding) High conservation concern

**Mallard (MA):** conservation status = Amber (Breeding) Medium conservation concern

**Merlin (ML):** conservation status = Amber (Breeding) Medium conservation concern

**Sparrowhawk (SH):** conservation status = Green Low conservation concern

**Teal (T.):** conservation status = Amber (Breeding) Medium conservation concern

Of the bird species recorded only Merlin is listed on Annex 1 of the EC Birds Directive.

A total of 37 flights by target species were recorded during the 2025 breeding season. **Figure 3.1** shows all flights observed during the vantage point surveys. The percentage breakdown of flights recorded per species are set out in Table 3.1 below.

**Table 3.1: Vantage Point Flight lines recorded during the 2025 Breeding season**

Species	No. Flights	Percentage Flights
Buzzard	15	41%
Grey Heron	4	11%
Kestrel	7	19%
Mallard	8	22%
Merlin	1	3%
Sparrowhawk	1	3%
Teal	1	3%

A summary of the observations for each target species is provided in the following subsections.

### **3.1.1 Buzzard**

Buzzard was the most frequently observed species during the 2025 breeding season vantage point surveys. A total of 15 Buzzard flights were observed during the breeding season. The majority of the flights, 11 of the 15, were observed in the western parcel of the Wind Farm Site. Of the 15 flights observed 12 were of an individual Buzzard and the remaining 3 flights were of pairs of Buzzards. This species was recorded flying a variable heights from <20m; 20 to 200m and >200m height bands, with a lower number of flights (No. = 4) incorporating flight activity at the higher elevation of >200m.

The range of activity recorded during flights included hunting, commuting and soaring.

**Figure 3.2** shows all Buzzard flights observed during the 2025 breeding season.

### **3.1.2 Grey Heron**

A total of 4 Grey Heron flights were observed during the 2025 breeding season. All flights were observed flying low at <50m for short durations (<45 seconds). All flights observed were of individual herons.

**Figure 3.3** shows the Grey Heron flights observed during the 2025 breeding season.

### **3.1.3 Kestrel**

A total of 7 no. Kestrel flights were recorded during the 2025 breeding season. Five of the seven flights were recorded in the eastern wind farm parcel from VP1 and VP2. All flights were recorded at low height at <50m. All flights were of a duration of less than 75 seconds, with 5 of the flights being less than 30 seconds. All flights observed were of individuals.

**Figure 3.4** shows all Kestrel flights observed during the 2025 breeding season.

### **3.1.4 Mallard**

A total of 8 no. Mallard flights were recorded during the 2025 breeding season. Six of the eight flights were recorded in the eastern wind farm parcel from VP1 and VP2. Flights were predominantly recorded at low height at <50m with one flight being recorded at 50m to 100m within the 20 to 200m height band. All flights were of short duration being <60 seconds. Two

of the flights observed were of individuals; two flights were of pairs; three flights were of 3 mallard; and one flight was of a small flock of 5.

The majority of flights were indicative of commuting.

**Figure 3.5** shows the Mallard flights observed during the 2025 breeding season.

### **3.1.5 Merlin**

One flight of a Merlin was recorded in May during the 2025 breeding season. This was of an individual Merlin flying fast and low over bog habitat to the north of the wind farm eastern parcel. The Merlin was observed in flight for c. 30 seconds before flying in a south-westerly direction.

**Figure 3.6** shows the Merlin flight observed during the 2025 breeding season.

### **3.1.6 Sparrowhawk**

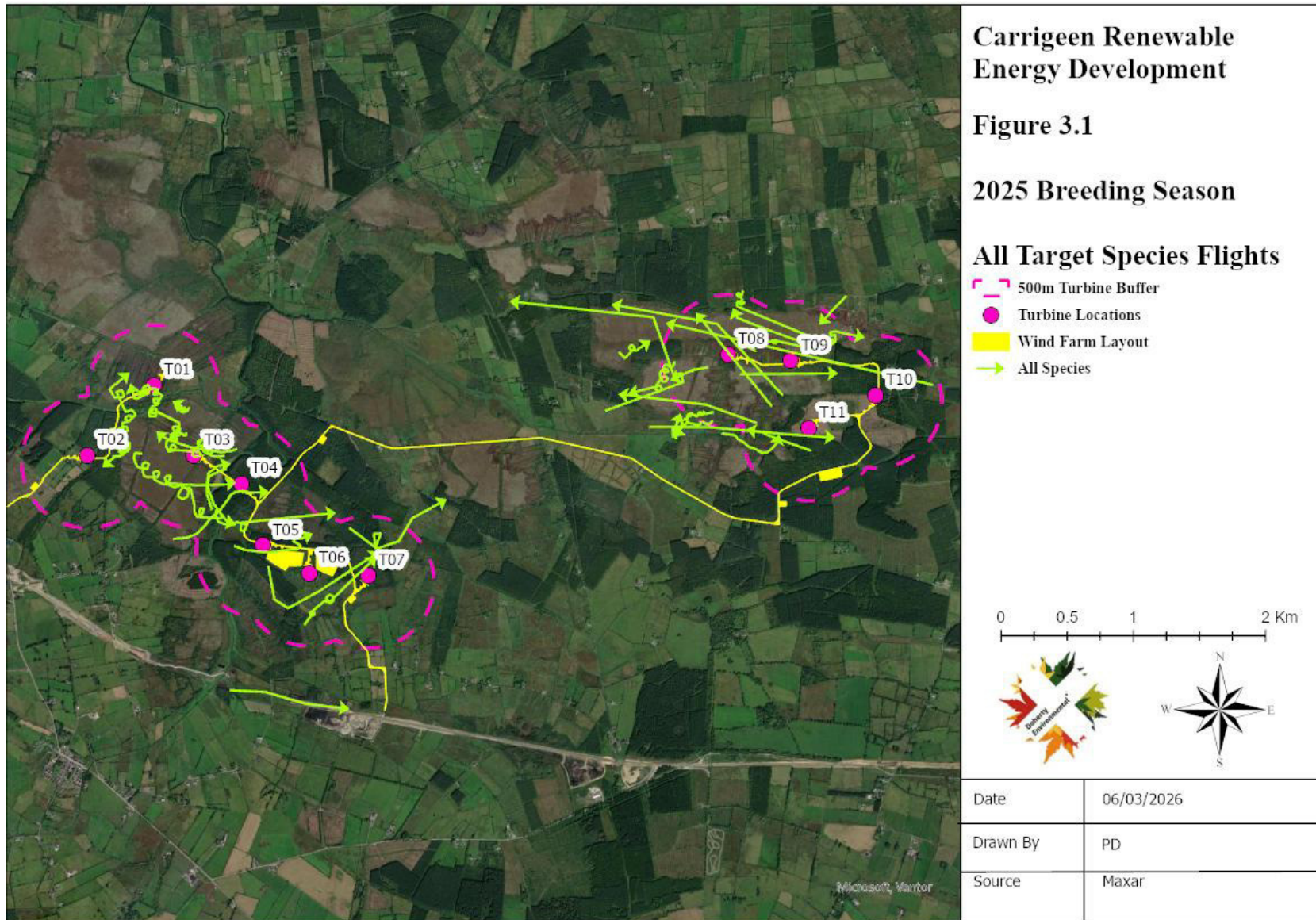
One flight of a Sparrowhawk was recorded during the 2025 breeding season. This flight was of an individual Sparrowhawk hunting in the vicinity of the Breedoge River corridor. The flight was observed low over the ground and lasted for c. 15 seconds.

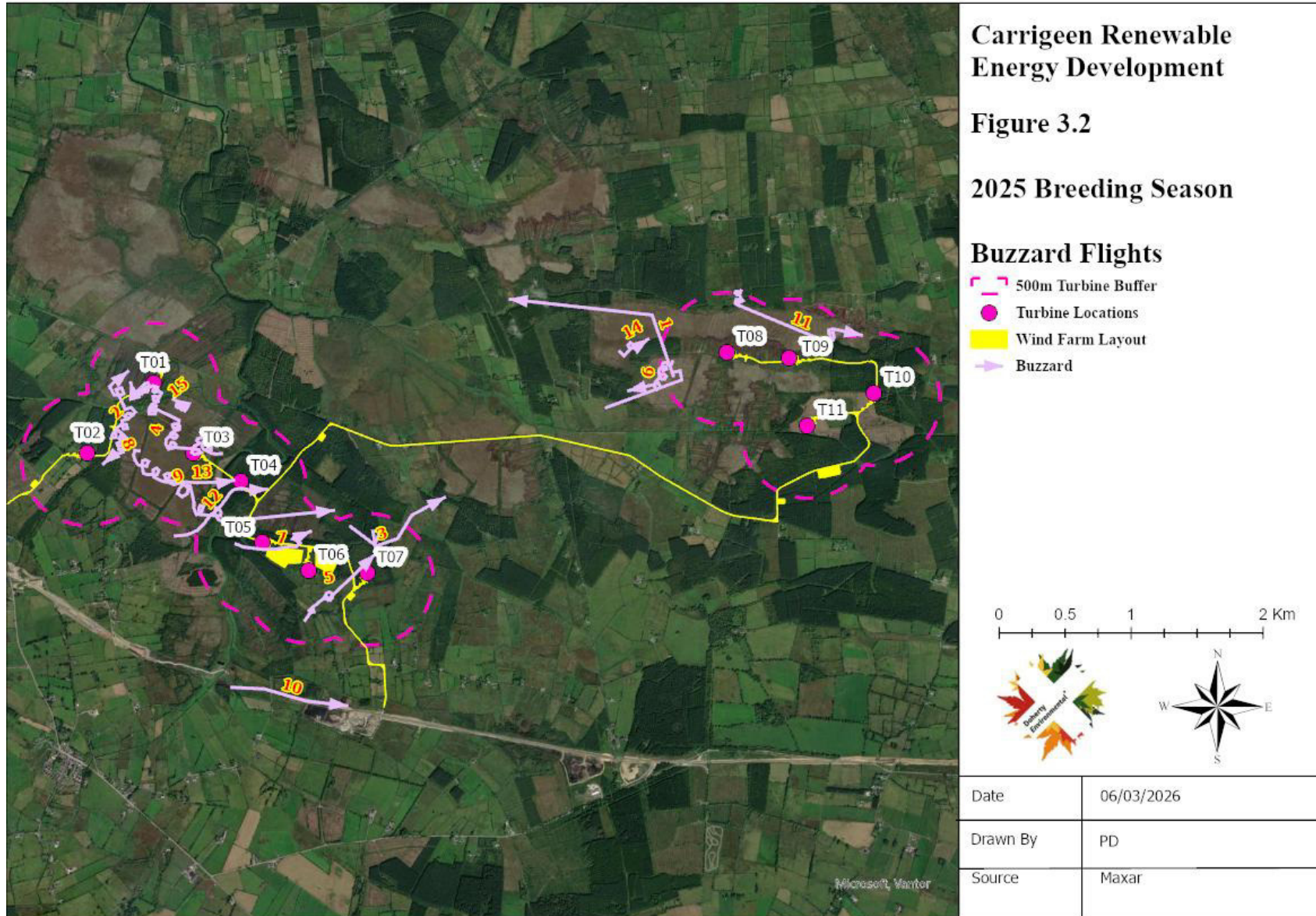
**Figure 3.7** shows the Sparrowhawk flight observed during the 2025 breeding season.

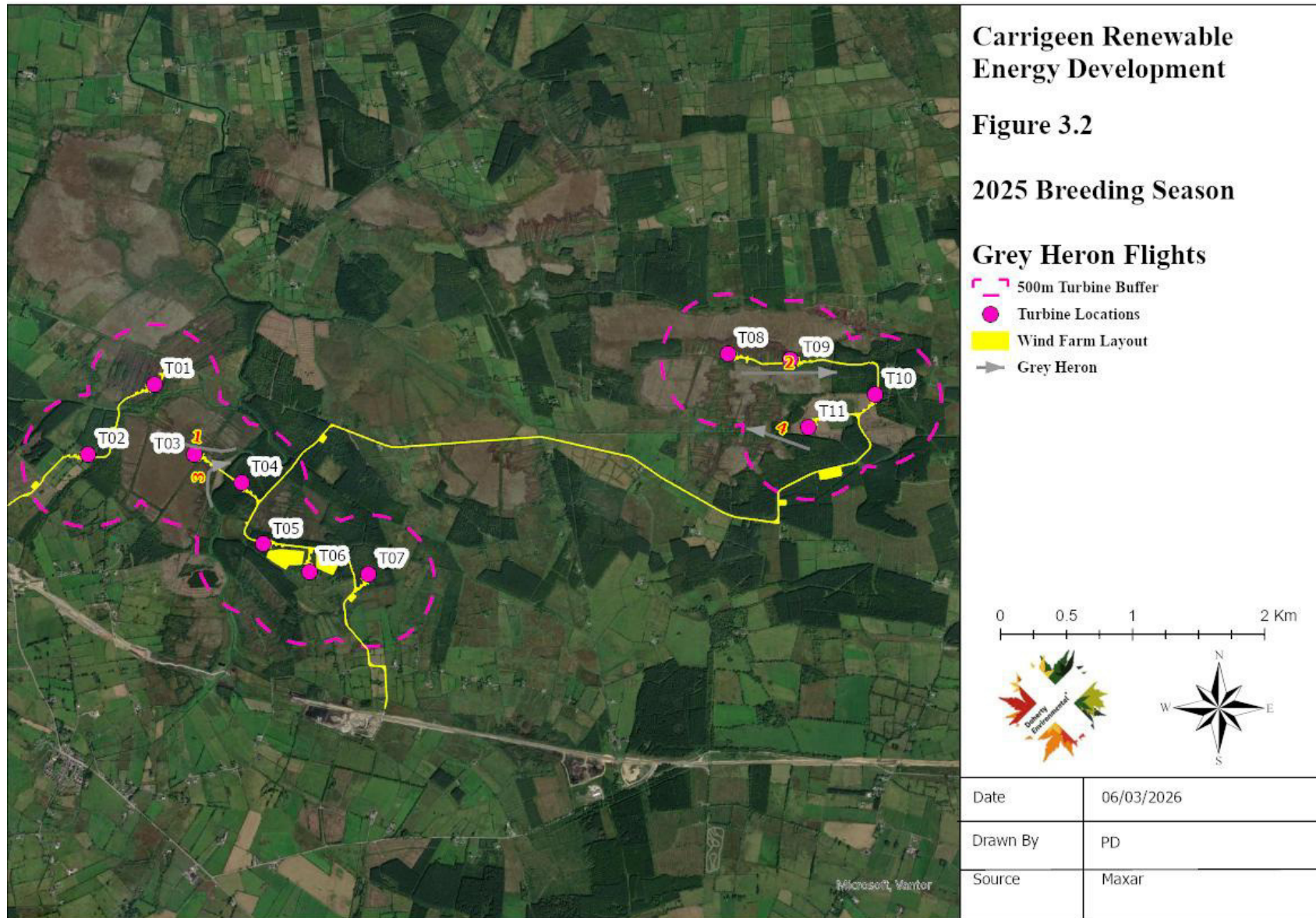
### **3.1.7 Teal**

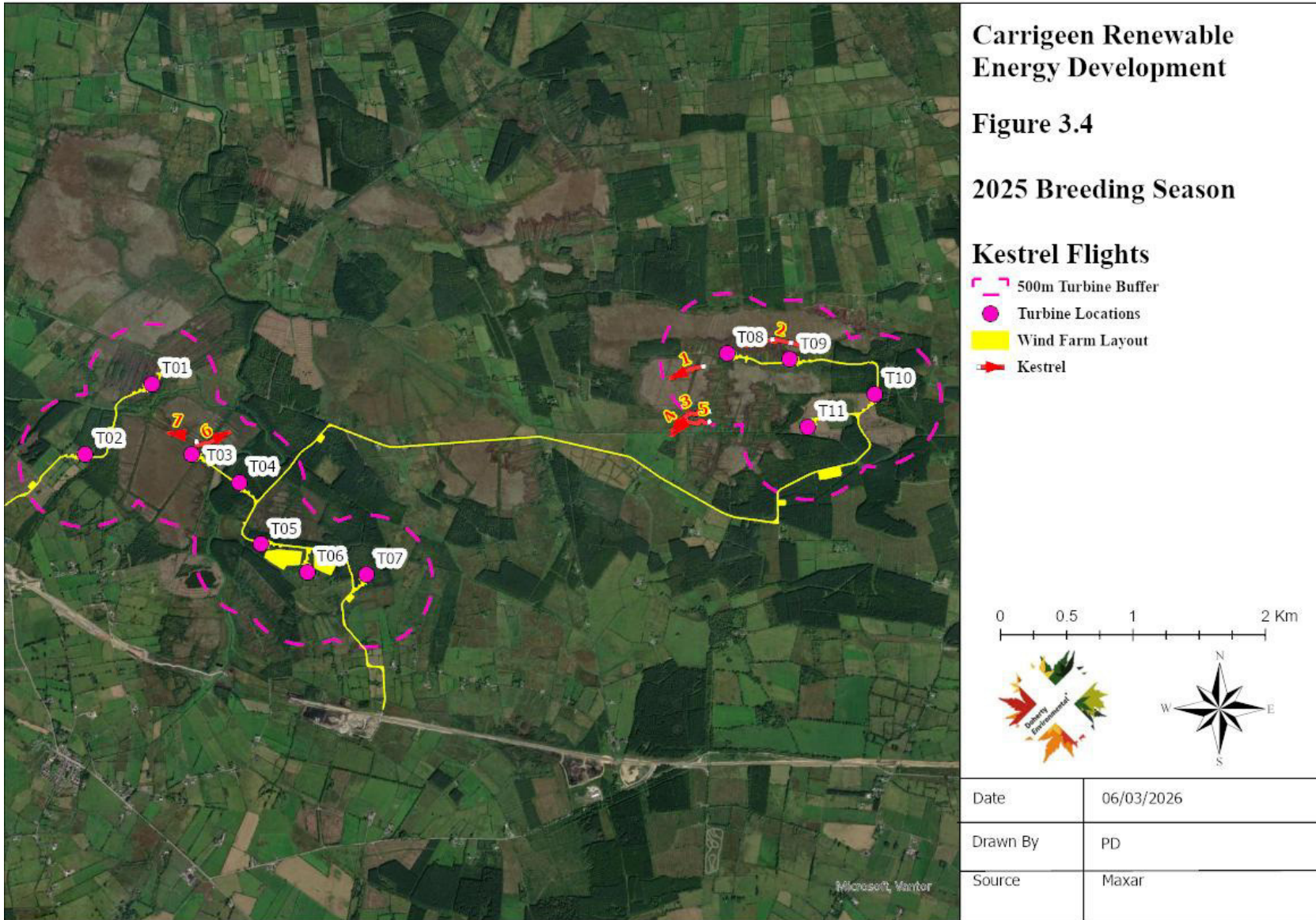
One flight of an individual Teal was recorded during the 2025 breeding season. This flight was of a Sparrowhawk mobbing a Buzzard. The flight was observed low over bog habitat to the north of the wind farm eastern parcel. The flight was of short duration lasting c. 75 seconds.

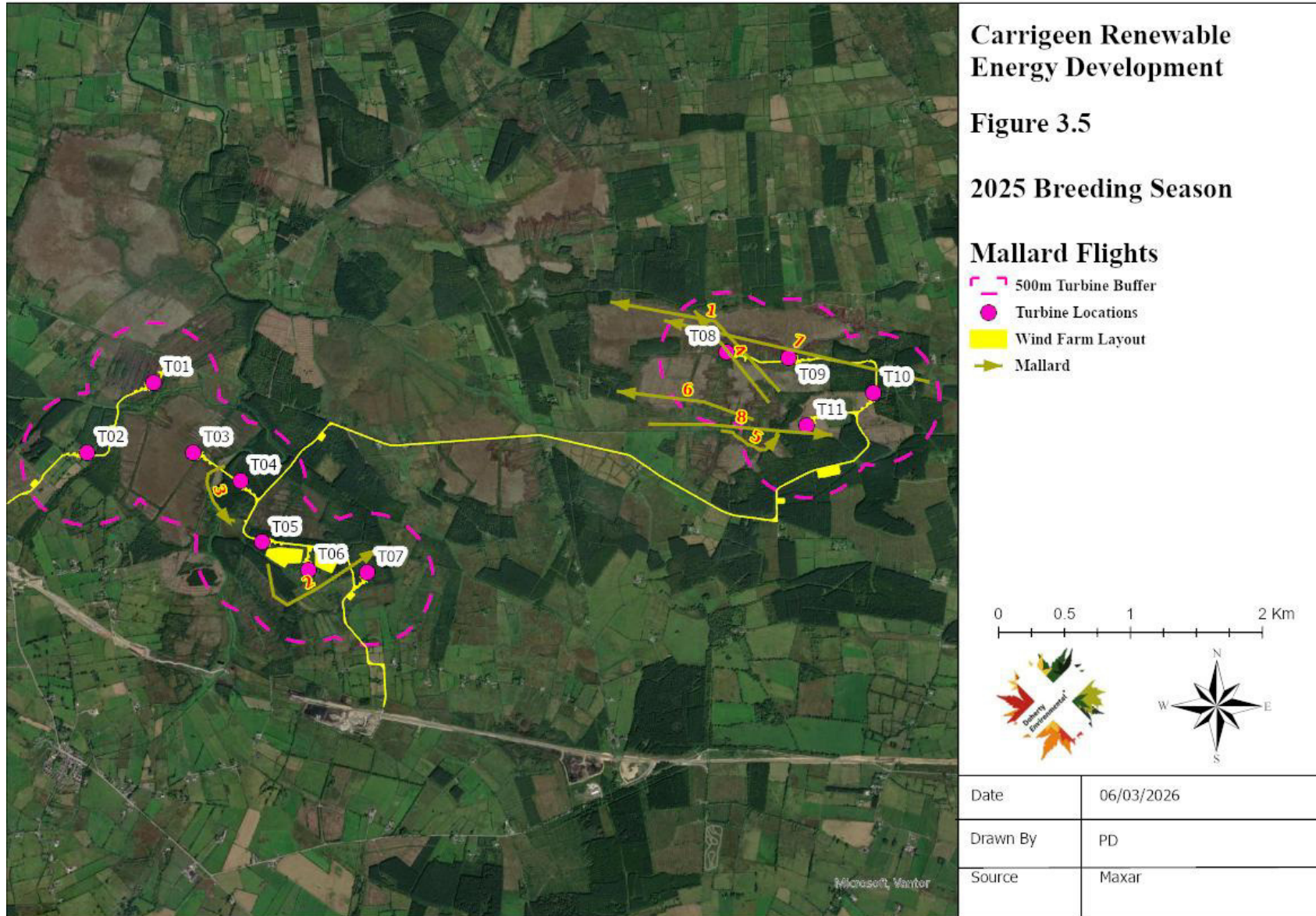
**Figure 3.8** shows the Teal flight observed during the 2025 breeding season.

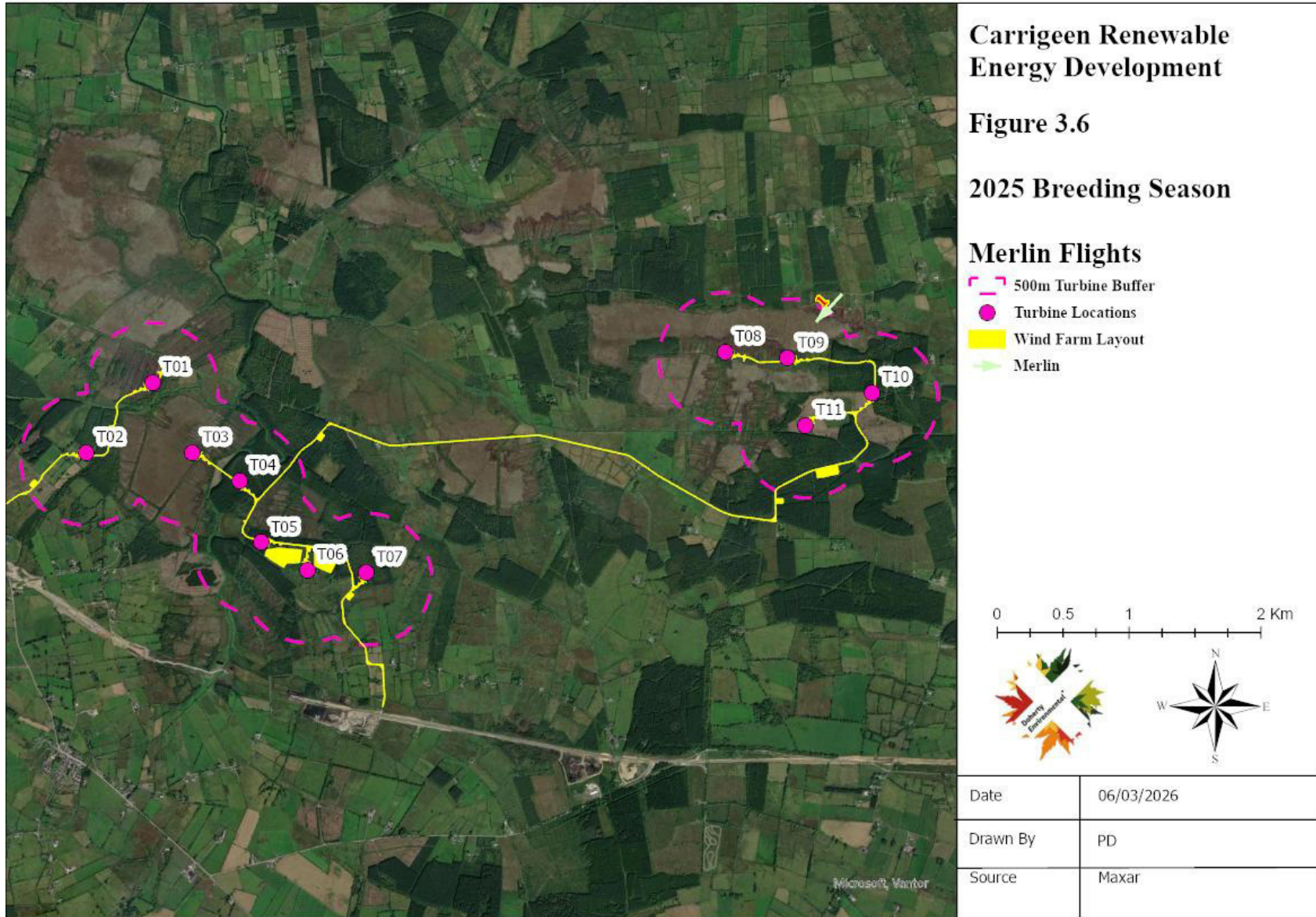


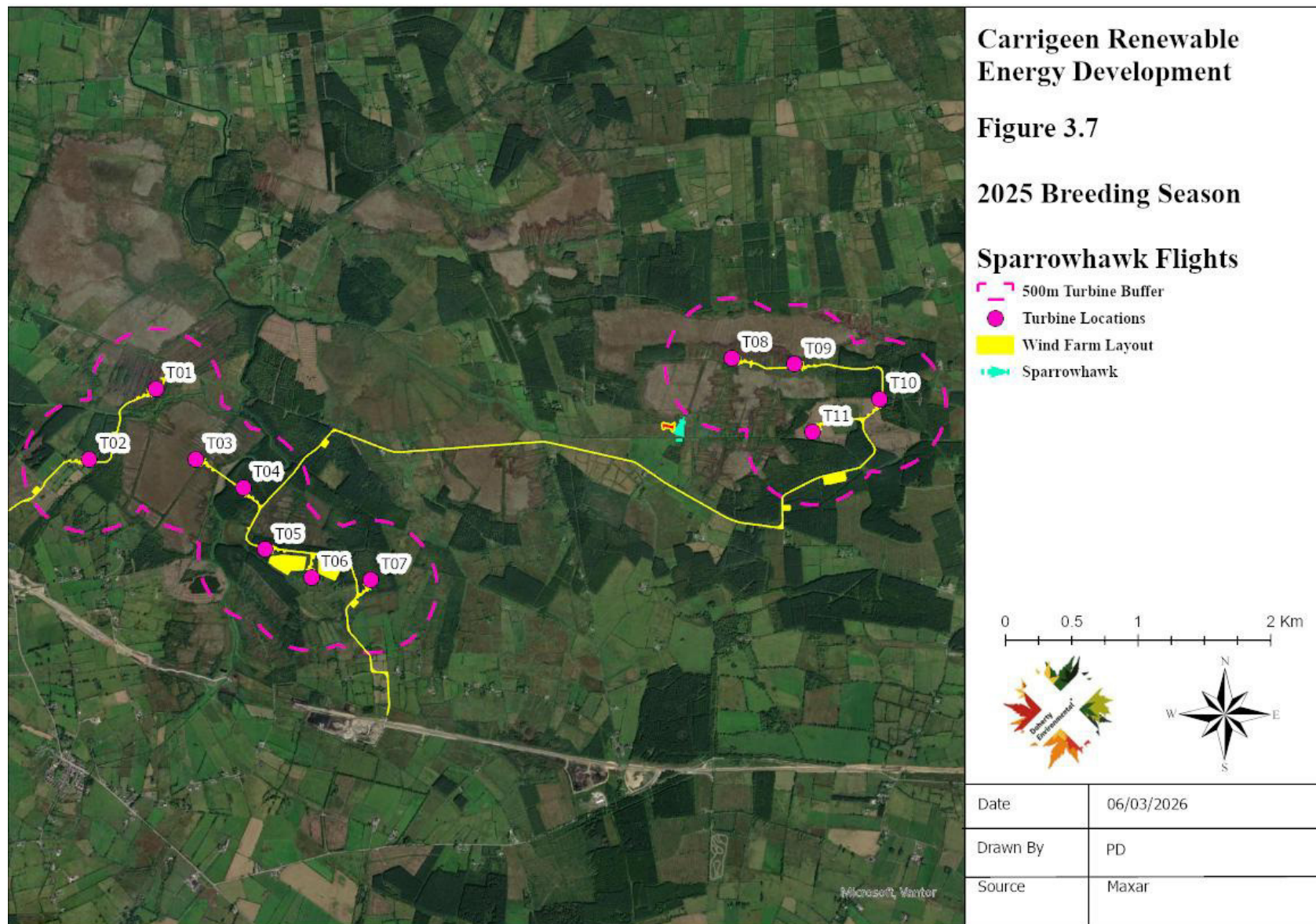


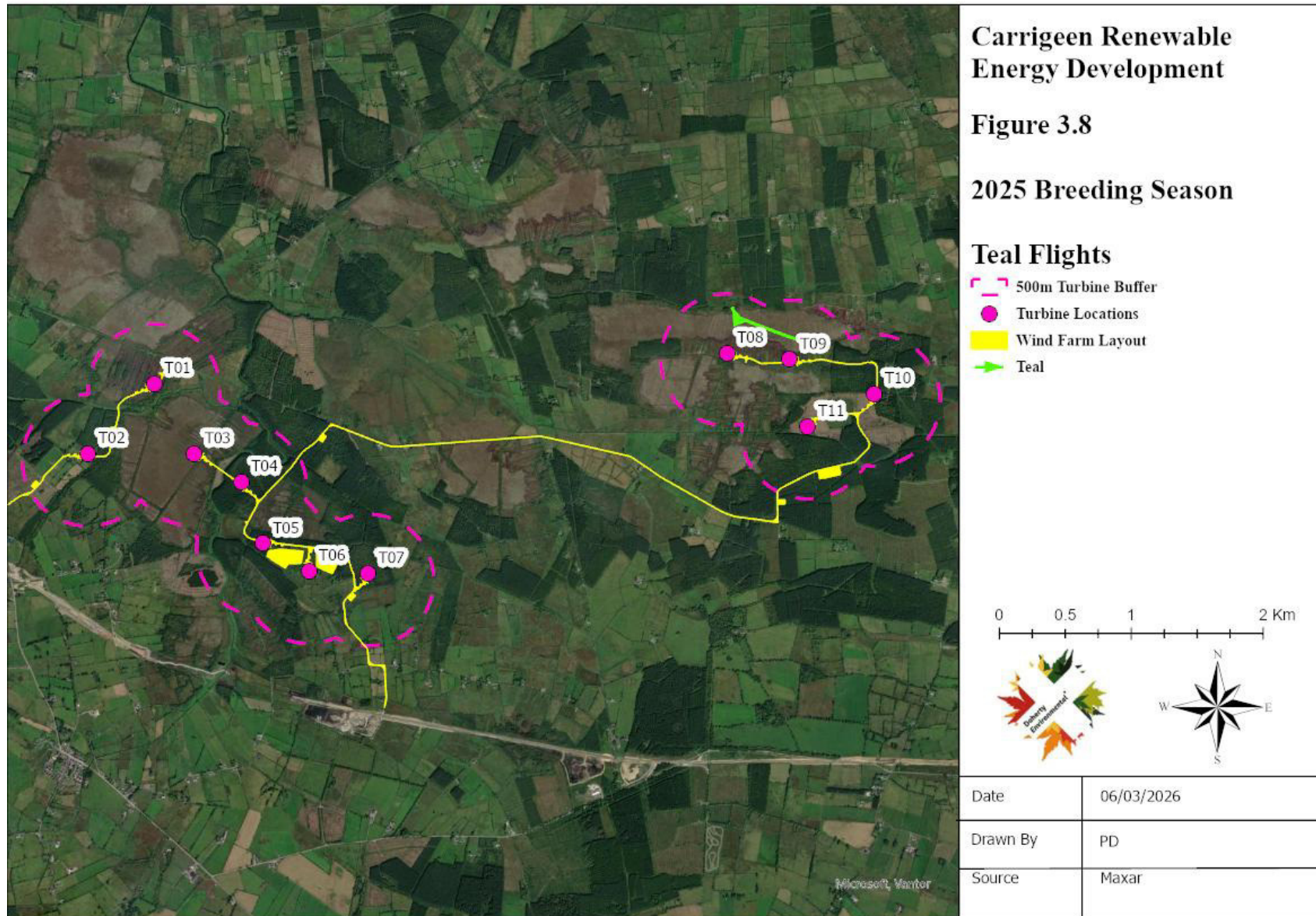












## **3.2 TRANSECT SURVEYS**

The results of the transect surveys completed between April and September are provided in Table 3.2 below. A total of 50 species were recorded during the 2025 breeding season transect surveys. The majority of the species recorded are of low conservation concern (Green-listed species). Eleven species of medium conservation concern (Amber-listed species) were recorded. These are Goldcrest, Greenfinch, Hen Harrier, House Martin, House Sparrow, Linnet, Mallard, Skylark, Starling, Swallow and Willow Warbler. Two species of high conservation concern (Red-Listed Species), namely Meadow Pipit and Snipe were recorded during the survey. Kestrel was recorded along transect 1 and 8. Meadow Pipit was recorded from all transects. Snipe was recorded along Transect 1; 4; 9; 10 and 11.

**Table 3.2: 2025 Breeding Season Transect Survey Results**

Species	BoCCI	Annex 1	Transect 1			Transect 2			Transect 3			Transect 4			Transect 5			Transect 6		
			08/04	09/06	11/07	08/04	09/06	11/07	08/04	09/06	11/07	08/04	02/06	01/07	01/05	02/06	22/07	01/05	02/06	22/07
Blackbird	Green	No	3	2	4	2	1	2	1	2	2			2	1		1			
Blackcap	Green	No	1	2	1									1						
Blue Tit	Green	No	3	2		3	2	1	1	1	1				1					
Bullfinch	Green	No								1				1						
Buzzard	Green	No			2															
Chaffinch	Green	No	6	7	2	2	4	2	3	1				3	1	3	1			
Chiffchaff	Green	No	3	2	2	1	1		1	1					1	1				
Coal Tit	Green	No	2	4	5	2	2	1	1	1				1	2	1	1			
Crossbill	Green	No												2						
Cuckoo	Green	No																		
Dunnock	Green	No				3		4		1					1					
Fieldfare	Green	No			2															
Goldcrest	Amber	No						2	1	3				1	2	4	2	3	1	2
Goldfinch	Green	No												3						
Great Tit	Green	No	2	1	1	2	2							2	1		1	2	1	
Greenfinch	Amber	No		1																
Grey Heron	Green	No																		
Hen Harrier	Amber	Yes			1															
Hooded Crow	Green	No						1							2			2		3
House Martin	Amber	No			1															
House Sparrow	Amber	No						1												
Jay	Green	No	1			1									1			1		
Jackdaw	Green	No																		
Kestrel	Red	No																		

Lesser Black-backed Gull	Amber	No																		
Lesser Redpoll	Green	No				2	1	2	1	3	3							2	3	1
Linnet	Amber	No	1	2	2					1	2			1			1	1		
Long-tailed Tit	Green	No	1		1	1		2	1					2			3	2	2	
Magpie	Green	No		2		2	1													
Mallard	Amber	No									1									
Meadow Pipit	Red	No		1	2	3	5	10	3		10	4	5	3	1	3	2	3	2	1
Mistle Thrush	Green	No																		
Pheasant	Green	No					1			1										
Pied Wagtail	Green	No	1			2	1													
Raven	Green	No																		
Red Wing	Red	No			1						1									
Reed Bunting	Green	No	1	1	1	1		1									1			
Robin	Green	No	3	2	2	2		1	1		1	1		1	1		1			
Rook	Green	No				3		2									2			
Siskin	Green	No	2	1	2						2		3				1			
Skylark	Amber	No	8	5	3	2		2	1	4	3	1	3		3	4	3	1		
Snipe	Red	No	5	3	12								3	2						
Song Thrush	Green	No	5	6	5	1		1					1	1						
Sparrowhawk	Green	No															2			
Starling	Amber	No	6		3	4		8			3									
Stonechat	Green	No	1			2	1		2	2	2			2						
Swallow	Amber	No						3		2				1	11	4	5	8	4	11
Teal	Amber	No																		
Treecreeper	Green	No	1	1		1		1	2					1						
Whitethroat	Green	No					1													
Willow Warbler	Amber	No	3	4	2	2	3	3	2		2		2	2						
Woodpigeon	Green	No	5	5		1		4		5	1		3	2	2			1	1	7

Wren	Green	No	1	3	3	2	1	2	1	1	1			1	1	2	1	1	2	2
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Species	BoCCI	Annex 1	Transect 7			Transect 8			Transect 9			Transect 10			Transect 11					
			01/05	02/06	22/07	01/05	19/06	18/07	01/05	19/06	18/07	01/05	19/06	18/07	01/05	19/06	18/07			
Blackbird	Green	No				2	2	2				2	2	2	2					
Blackcap	Green	No																		
Blue Tit	Green	No	2	1	1							1	1	1	1					
Bullfinch	Green	No								2	2									
Buzzard	Green	No											1							
Chaffinch	Green	No	5	3	2		2	2	1			3	3	3	2					
Chiffchaff	Green	No	1		1				1	2	2	1	1							
Coal Tit	Green	No	2	2		1	3		1	1	1	1	2	2						
Crossbill	Green	No	2	4					3	1										
Cuckoo	Green	No	1																	
Dunnock	Green	No				1	1					1			1					
Fieldfare	Green	No							1											
Goldcrest	Amber	No	2	5	3							3	2	2						
Goldfinch	Green	No							3	2	2									
Great Tit	Green	No	3	3	1	2	2	1	3			2	2	2						
Greenfinch	Amber	No								1	2	1								
Grey Heron	Green	No																		
Hen Harrier	Amber	Yes																		
Hooded Crow	Green	No	3	5	2	5			1	2	3	1						3		
House Martin	Amber	No										1		1						
House Sparrow	Amber	No				1														
Jay	Green	No		1																

Jackdaw	Green	No	4	1					12		5				2	4	
Kestrel	Red	No							1								
Lesser Black-backed Gull	Amber	No															
Lesser Redpoll	Green	No	2	1						1		1	1		1	2	2
Linnet	Amber	No				1			1	2		1	1	1			
Long-tailed Tit	Green	No	1	2		1			2		2	6	3	2			
Magpie	Green	No	1			1											
Mallard	Amber	No															
Meadow Pipit	Red	No	1	1		1			7	5	6	4	4	5	5	9	8
Mistle Thrush	Green	No							1								
Pheasant	Green	No								1							
Pied Wagtail	Green	No		1												3	
Raven	Green	No					2		1								
Red Wing	Red	No															
Reed Bunting	Green	No				1									2		
Robin	Green	No	1	2	1	2	2	1	2	2	4	2	3	3	2		
Rook	Green	No						2	2								
Siskin	Green	No	2	1	2							1	1	1			
Skylark	Amber	No	2	1	1				4	4	4	2		2	7	3	3
Snipe	Red	No							2	1		1	1		4	3	4
Song Thrush	Green	No	1														
Sparrowhawk	Green	No															
Starling	Amber	No															
Stonechat	Green	No	1	2	2	2	2	3				1	1				
Swallow	Amber	No							1	2	1						
Teal	Amber	No															
Treecreeper	Green	No															
Whitethroat	Green	No															

Willow Warbler	Amber	No				2	3	3	1	2		2	1	2	1		
Woodpigeon	Green	No	2	1	4	4		4	4		5	1	3	3	2		
Wren	Green	No	1	4	2	1	1	1	3	1	3	3	3		4		

### 3.3 HINTERLAND VANTAGE POINT SURVEYS

A total of four no. target species and 19 no. flight observations were recorded during the 2025 breeding season hinterland vantage point surveys. These comprise Buzzard, Kestrel, Lesser Black-backed Gull and Mallard. The flights observed were comprised of the follows:

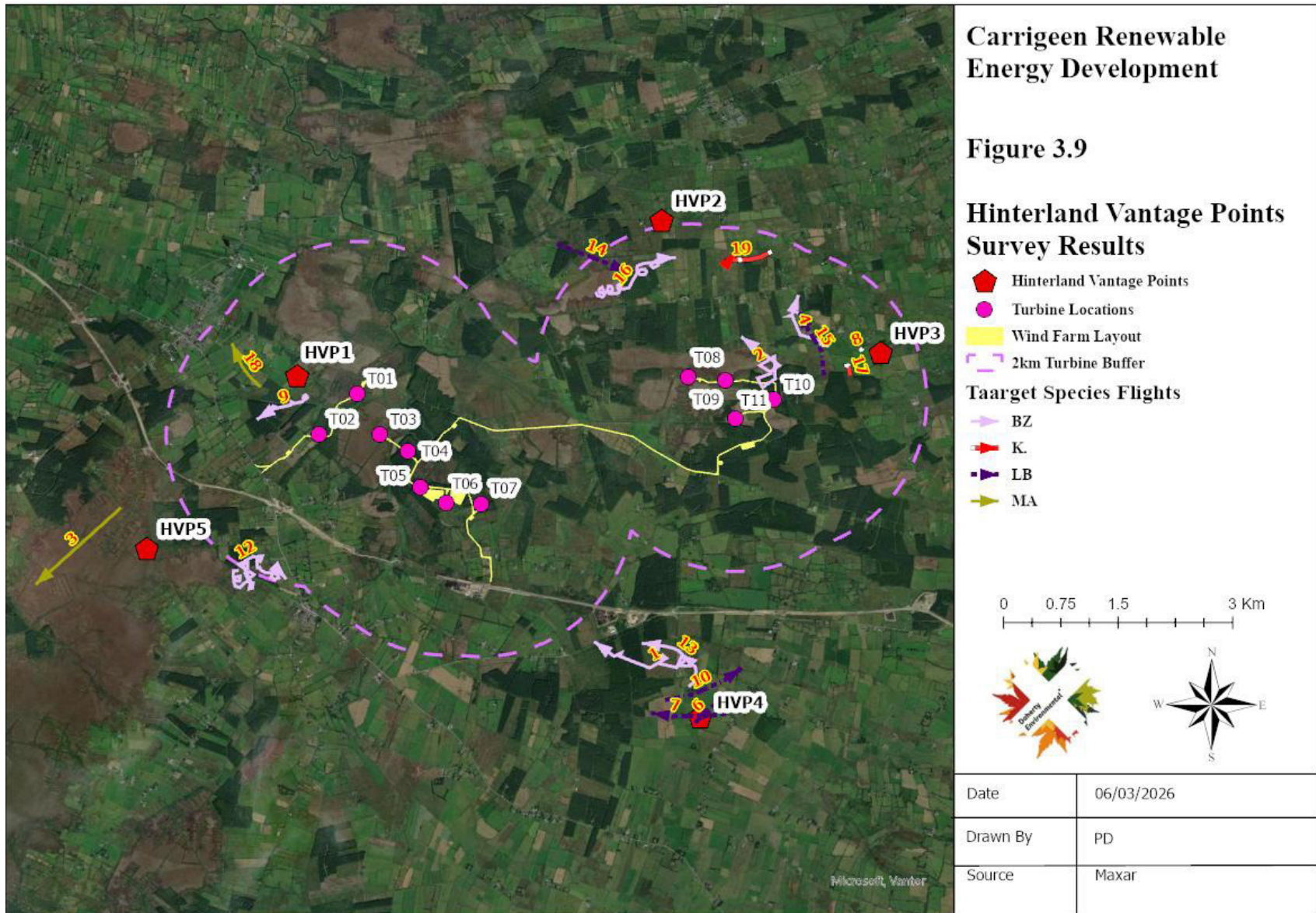
Seven no. flights of Buzzard from all HVPs. Six of the seven flights were of individual Buzzards with a pair observed from HVP3;

Three no. Kestrel flights were recorded from HVP 2 and 3. all three flights were of individual Kestrel flying low hunting.

Five no. flights of a commuting Lesser Black-Backed Gull were observed from HVP2; 3 and 4. Three of the flights were recorded from HVP4, two of which comprised individual gull and the remaining flight was of 3 gulls. Three gulls were associated with the flights recorded from HVP2 and 3; and

Two no. flights of a Mallard were recorded from HVP1 and 5. Both flights were of three birds.

The flight lines recorded for these species during the 2025 hinterland vantage point surveys are shown on Figure 3.9.



### **3.4 NOCTURNAL & BREEDING WADER SURVEYS**

No evidence of breeding waders or nocturnal target species comprising Woodcock and Nightjar were recorded during the nocturnal transect surveys.

### **3.5 MERLIN SURVEY**

No evidence indicating the presence of breeding merlin were recorded during the 2025 breeding merlin surveys.

### **4.0 CONCLUSION**

During the 2025 breeding season vantage point surveys were completed for the Project.

During the vantage point surveys a total of 37 flightlines were recorded comprising 7 no. target species. The activity recorded during the vantage point surveys was dominated by Buzzard, accounting for c. 40% of all flight activity recorded. Low levels of flight activity for all other target species were recorded.

A total of 3 red-listed species of high conservation concern (Kestrel, Meadow Pipit & Snipe) and 14 amber-listed species of medium conservation concern (Goldcrest, Greenfinch, Hen Harrier, House Martin, House Sparrow, Lesser Black-backed Gull; Linnet, Mallard, Merlin, Skylark, Starling, Swallow, Teal and Willow Warbler) were recorded during the 2025 breeding season surveys.

Hen Harrier and Merlin comprised the bird species listed on Annex 1 of the EC Birds Directive that were recorded during the 2025 breeding season surveys. No evidence of breeding of both species was recorded at Wind Farm Site and surrounding hinterland during the 2025 breeding season surveys.