GDG
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GEOSOLUTIONS

Illaunbaun Wind Farm - Environmental Impact Assessment Report

Appendix A08-07: Other Ecology Receptors Baseline

This report considers the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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Quality Assurance

The findings outlined within this report and the data we have provided are to our knowledge true and express our bona fide professional opinions. This report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) good practice guidelines. Where pertinent CIEEM Guidelines used in the preparation of this report include the *Guidelines for Ecological Report Writing* (CIEEM, 2017a), *Guidelines for Preliminary Ecological Appraisals* (CIEEM, 2017b) and *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine*, (CIEEM, 2024). CIEEM Guidelines include model formats for Preliminary Ecological Appraisal and Ecological Impact Assessment. Also, where pertinent, evaluations presented herein take cognisance of recommended Guidance from the EPA such as *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022), and in respect of European sites, *Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (European Commission, 2018).

Due cognisance has been given at all times to the provisions of the *Wildlife Act, 1976-2023,* the *European Union (Natural Habitats) Regulations*, the *European Communities (Birds and Natural Habitats) Regulations 2011-2021,* EU Regulation on Invasive Alien Species under *EU Regulation 1143/2014*, the EU Birds *Directive 2009/147/EC* and *Habitats Directive 92/43/EEC*.

No method of assessment can completely remove the possibility of obtaining partially imprecise or incomplete information. Any limitation to the methods applied or constraints however are clearly identified within the main body of this document.

Version	Date		Name	Signature
1	04/01/2023	**Report prepared by:**	Conor Daly BSc (Hons) ACIEEM	
2	24/04/2025	**Report Amended by:**	Laura Stenson BSc	
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Project Reference	2216L	**Title**	Illaunbaun Wind Farm Other Ecology Receptors Technical Appendix	

Notice

This report was produced by INIS Environmental Consultants Ltd. (INIS) on behalf of GDG, for the specific purpose of assessing a bat baseline at Illaunbaun Wind Farm, Co. Clare, with all reasonable skill, care and due diligence within the terms of the contract with the client, incorporating our terms and conditions and taking account of the resources devoted to it by agreement with the client.

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1 INTRODUCTION

1.1 Purpose of Technical Appendix

This appendix presents the remaining species baseline not addressed in the other appendices for the proposed Illaunbaun Wind Farm Project (from here on referred to as the 'Proposed Development') and the associated Zone of Influence (ZoI) relevant to terrestrial invertebrates (Marsh fritillary), amphibians and reptiles, and supports the Biodiversity Chapter of the Environmental Impact Assessment (EIA). The Proposed Development comprises all the land under consideration at the time of surveys that falls within the "Site Layout" of the wind farm site and is provided in the Description of Development in the Main EIA Document.

Aquatic invertebrate species are addressed in the aquatics baseline report where potentially suitable habitats are identified, and relevant records are detailed (**Appendix A08-06**).

1.1.1 Statements of Authority

This report has been prepared by experienced RSK Biocensus and Inis Environmental Consultants Ltd (INIS) ecologists, based on field data collected by skilled INIS ecologists who are experienced in undertaking field surveys of relevant habitats and species. The contributors to this chapter are listed below:

Dr. Alex Copland BSc PhD MIEnvSc MCIEEM reviewed this report. He is a qualified ecologist with over 30 of professional experience working in both statutory and private companies, in third-level research institutions and with environmental NGOs. He is proficient in experimental design and data analysis and has managed several large-scale, multi-disciplinary ecological projects. These have included research and targeted management work for species of conservation concern, the design and delivery of practical conservation actions with a range of stakeholders and end-users, education and interpretation on the interface between people and the environment and the development of co-ordinated, strategic plans for birds and biodiversity. This work has been delivered in Ireland, where he has worked with NGOs and industry as well as public officials, and the EU, where he has worked with EU-level NGOs as well as EU institutions (EU Commission and EU Parliament).

He has written numerous scientific papers, developed and contributed to evidence-based position papers, visions and strategies on birds and habitats in Ireland. He has supervised the successful completion of research theses for several post-graduate students, including doctoral candidates. He lectures to both undergraduate and post-graduate students at UCD, as well as being a collaborative researcher with both UCD and UCC. He also sits on the Editorial Panel of the scientific journal, *Irish Birds*, which publishes original ornithological research relevant to Ireland's avifauna.

Peter O Connor BA MSc is GIS Manager with INIS and is experienced in overseeing the completion of mapping for multiple Wind Farm projects. Peter has 5 years experience in conducting Viewshed Analysis in support of selected Vantage Points for ornithological surveys, involving the use of Digital Terrain Models and Digital Elevation Models in addition to bespoke Viewshed Analysis plugins for QGIS. Peter also has experience with field data capture and integration into project mapping (e.g., for habitats and species), including for figures supporting EIAR chapters and associated reports. Peter led the production of figures, calculations and all other GIS inputs to this EIAR chapter.

Ms Laura Stenson BSc is an Ecologist with Inis Environmental Consultants Ltd. who drafted this report. Laura has an honours BSc in Earth and Ocean Sciences from University of Galway and has three years' experience working in consultancy. Laura has 3 years of report writing experience, which includes the production, review and editing of Appropriate Assessment Screening Reports (AA), Natura Impact Statements (NIS) and Ecological Impact Assessments (EcIA). She has experience in multi-disciplinary surveys, including habitat classification, mammal surveys, various bird surveys (e.g. winter and breeding birds, I-WeBS, Adapted Brown & Shepherd), invasive species surveys, pre-construction mammal surveys, and bat surveys. She is a Qualifying member of CIEEM.

Mr Conor Daly ACIEEM MSc BSc (Hons.) (Ecologist, INIS) is the Report Team Lead with Inis Environmental. Authored this report as part of the Inis report writing team baseline technical reports submissions. Conor was awarded an MSc in Biodiversity and Conservation from Trinity College Dublin in 2017 and an Honours BSc in Zoology for the University of Galway in 2016. Conor has been conducting ornithological surveys for projects since 2021 for a variety of projects including industrial estates and wind farms (Small-Large). Conor has experience in Raptor conservation with ample experience with bird of prey pressures and threats to protected species and has provided reports for EIAR and NIS reports while working with Inis Environmental Ltd. Conor is an Associate member of CIEEM.

Ms Katie Sullivan BA MSc is Quality Control Manager at Inis Environmental Consultants Ltd. Katie was awarded a BA in Natural Sciences (Zoology) from Trinity College Dublin and a MSc in Wildlife Conservation and Management from University College Dublin, where her research focused on modelling the impacts of result-based agri-environmental schemes on pollinator communities in semi-natural grasslands. Katie has 3 years experience in wildlife and ecological surveying. As part of her role with INIS, Katie has completed bat, mammal, ornithological, herpetological and entomological surveys in line with Best Practice Standards. Katie has previously worked on INIS' GIS team and has experience creating report mapping, conducting viewshed analyses and developing online mapping tools. Katie is also a Qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM)).

Ms Nicole Leadbetter BSc MSc conducted the amphibian and reptile surveys and is an Assistant Ecologist at Inis Environmental Consultants Ltd. Nicole has achieved a BSc (Hons) in Animal & Conservation Biology from Edinburgh Napier University and a MSc (Hons) in Environmental Management from the University of Stirling. She had completed a variety of surveys including vantage point surveys, I-WeBS, breeding bird transects, as well as habitat and mammal surveys over two years with Inis. Nicole is also part of the bat survey team where she carries out emergence surveys, transects, static detector deployment and bioacoustics analysis. Nicole is also a member of the report team and has drafted AA screenings and baseline ecology reports for small- and large-scale developments. Nicole is a qualifying member of CIEEM.

Ms Lisa Kavanagh MSc BSc is an Assistant Ecologist at Inis Environmental Consultants Ltd and conducted the reptile surveys. Lisa has achieved a BSc (Hons) in Zoology from the National University of Ireland, Galway and a MSc (Hons) in Biodiversity & Conservation from Trinity College Dublin. She has completed a wide array of bird surveys including vantage point surveys, I-WeBS, hen harrier roost monitoring, breeding wader surveys and breeding bird transects over two years with Inis. As the Mammal Team lead, Lisa oversees camera trap deployments across a variety of sites, and carries out camera trap image analysis, general mammal walkover surveys and small mammal trapping. Lisa is

also part of the bat survey team where she carries out emergence/re-entry surveys, transects, static detector deployment and bioacoustic analysis. Lisa holds a LANTRA accredited qualification in conservation detection dog handling and is a qualifying member of CIEEM.

Molly O'Hare BSc MSc carried out otter watercourse surveys, mammal walkovers which overlapped with the reptile and amphibian survey efforts. She is a Bat Ecologist with Inis Environmental Consultants Ltd, has a BSc in Ecology and Environmental Biology and an MSc in Marine Biology from University College Cork. She was the lead surveyor for bat surveys for this project with three years experience conducting general mammal surveys. Molly also has experience in the preparation and writing of reports, including ecology reports and screening for Appropriate Assessment.

Ms Emma Condron BSc is the Environmental Manager with Inis Environmental Consultants Ltd, in charge of all ECoW operations and onsite reviews who conducted the marsh fritillary suitability surveys and the reptile/amphibian surveys which overlapped with general mammal walkover and otter/badger and red squirrel target surveys for this project. She was awarded an honours BSc degree in Wildlife Biology from the Institute Technology Tralee. This course provided her with the knowledge and understanding of Irish Wildlife and the environment. Emma had four years of experience in bat emergence and re-entry surveys for various construction projects across Ireland and reptile/amphibian surveys. Ms Emma Condron has received training on bat ecology and bat call analysis. She has nearly three years' experience in conducting ecological bird surveys, both in the field and with data management. She has taken part in CIEEM led report writing training. Emma is a Qualifying member of CIEEM. Emma has report writing experience, including Appropriate Assessment Screening, and Ecological Clerk of Works (ECoW) audits.

1.1.2 Structure of Technical Appendix

This technical appendix has been set out as follows:

- **Section 2** sets out the approach and methodology used for obtaining the desk-study and survey data. The detail of the desk-study information acquired is presented in **Section 2.1**, whilst the field study methodology is presented in **Section 2.2**. Any constraints or limitations to survey efforts are addressed in **Section 2.3**;
- **Section 3** sets out the results of the desk and field studies used to inform the baseline conditions and summarises the ecological features present for invertebrate, amphibian and reptile target species within the Proposed Development;
- **Section 4** provides a brief description of the overall baseline within the receiving environment and the scoping in or out of the Important Ecological Features (IEFs). **Section 4.3** summarises the IEFs scoped in for the main report impact assessment.

In summary it is considered that no significant constraints occurred during the monitoring period, and the survey data provides accurate detail on the baseline biodiversity in relation to invertebrate, amphibian and reptile species within the Site Layout and the immediate surrounding area.

1.2 Legislation

The following legislation has been used and considered when developing the baseline for the Proposed Development:

- EU Habitats Directive (1992) Council Directive 92/43/EEC;
- Irish Wildlife Acts 1976 to 2023;
- National Biodiversity Action Plan (2023 – 2030);
- Clare County Development Plan 2023 – 2029; and
- Clare Biodiversity Action Plan 2017-2023.

1.3 Guidance & Best Practice

The following guidance has been used and considered when developing the baseline for the Proposed Development:

- All-Ireland Pollinator Plan 2021-2025;
- Environmental Protection Agency (2022) Guidelines on the Information to be contained in EIA Reports, Draft;
- Marsh Fritillary Monitoring Scheme (2015). National Biodiversity Data Centre;
- NRA (2006). Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. National Road Authority;
- NRA (2008) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes. National Roads Authority;
- National Roads Authority (2009a) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes;
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009b);
- NRA (2005) Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes; and
- Practice Note PN02: Environmental Impact Assessment Screening Screening for Development Management OPR (2021).

1.4 Zone of Influence

The maximum extent of the ZoI considered for the target species is 15km from the Proposed Development. These target species vary in their commuting, migration, foraging and dispersal ranges. As such, the ZoI was based on species-specific ranges (where evidence was available). Where no clear ranges for these species was available, worst-case scenario ZoI of 15km was applied.

1.4.1 Marsh fritillary

Marsh fritillary (*Euphydryas aurinia*) is an Annex II species under the EU Habitats Directive. It is found in meta-populations within calcareous grasslands supporting its host plant (Devil's-bit scabious (*Succisa pratensis*)). As such, there is potential habitat found within the ZoI of the Proposed Development where suitable grassland habitat mosaics are present. This species is monitored by Butterfly Conservation Ireland (BC) and National Parks and Wildlife Services (NPWS) where it occurs nationwide and within designated sites respectively. This species undergoes local extinction and recolonisation events infrequently due to its niche host plant requirements (Harding, 2022). Dispersal distances of up to several kilometres have been reported in the literature, though most movements are typically under 1km (Warren, 1994; Harding, 2022; Phelan *et al.*, 2021). As such, any designated

site within 15km of the Proposed Development that lists marsh fritillary as a Qualifying Interest (QI) was considered for potential interaction with any suitable areas of habitat present with the smaller 50m ZoI.

1.4.2 Amphibian and Reptile

Common frog (*Rana temporaria*) is an Annex V species under the EU Habitats Directive and is protected under the Wildlife Acts (2023) and Annex III of the Bern Convention. It utilises a broad habitat range including, but not limited to, lakes and ponds, grassland and marsh, wet heath, peatlands and woodland and scrub (Marnell, 1999; NBDC, 2025). As such, there is potential habitat found within the ZoI of the Proposed Development. Smooth newt (*Lissotriton vulgaris*) is protected under the Wildlife Acts (2023) and Annex III of the Bern Convention. It utilises habitats which provide protection from desiccation such as grassland, woodland and scrub. As such, there is potential habitat found within the ZoI of the Proposed Development. Common lizard (*Zootoca vivipara*) is protected under the Wildlife Acts (2023) and Annex III of the Bern Convention. Common lizard utilises damp habitats, such as wet grassland, and woodland and scrub, as well as residing in peatland, dry grassland and heath (The Herpetological Society of Ireland, 2025). As such, there is potential habitat found within the ZoI of the Proposed Development.

The ZoI for the common frog, smooth newt and common lizard was identified as all areas within 50m following a precautionary principle for presence of the Proposed Development, which overlapped with the ZoI assigned to mammal groups under NRA Guidance (NRA, 2005). Amphibian and Reptile Conservation (ARC) methodology was considered to inform any wider ZoI pathways for these species. Any watercourses interacting with the Proposed Development were also considered within the ZoI for amphibians and were considered in the aquatics surveys.

Amphibian Suitability Surveys were conducted on the 21st of July 2024, and Amphibian Activity Surveys were conducted on the 4th and 24th of July 2024. Reptile Surveys were conducted on the 27th of May, the 21st of June, the 24th of July and the 16th of September 2024.

1.4.3 Other

The ZoI of any other remaining receptors (e.g. Red-list invertebrate species) were assigned a ZoI of 50m from the project elements and included recording of the following field signs of target groups during terrestrial mammal surveys within the study area:

- Pollinator friendly patches;
- Flower-rich or pollinator-friendly vegetation patches;
- Areas of bare ground or well-used paths (potential basking or nesting habitat);
- Locations with evidence of foraging activity;
- Features offering shelter or overwintering potential, such as tussocky grass, dry-stone walls, or deadwood.
- Well used tracks/paths;
- Prints/tracks;
- Scat/ droppings;
- Signs of feeding;

- Places of shelter and features or areas likely to be of particular value as foraging resources (NRA, 2005);
- Photographs and detailed notes were also recorded for each feature and mapped using QGIS; and
- Records of incidental sightings of individuals or other evidence from other surveys were also considered to inform the baseline data.

1.5 Study Area

The desktop study focused on the Proposed Development. The study area consisted of checking the two National Biodiversity Data Centre (NBDC) 10km grid squares R08 and R18 (NBDC, 2025) that the Proposed Development overlaps.

The field study area for all target species in this report was 50m from the nearest project element or associated works. This study area reflected the best practice guidance utilised for mammal, amphibian, reptiles and invertebrate receptors (NRA, 2005).

Marsh fritillary surveys were conducted independently at the appropriate time of year (August, September) to detect the target life-stage (larval) of this Annex II (EU Habitats directive) species.

Incidental records from survey efforts for other target receptor groups were also considered and are provided in the relevant results section.

Each receptor type and their respective surveys are outlined in **Table 1.1**.

Table 1.1: ***Receptor Surveys and Survey Ranges.***

Receptor	Survey Type	Field Study Area	Reasoning
Marsh Fritillary	Habitat suitability	Any areas within 50m of the wind farm footprint	Maximum range of potential impact/interaction on larval webs. Encompasses potential for host plant presence and oviposition habitat within the habitat baseline.
	Larval web searches	Any sections identified during suitability surveys	Based on habitats meeting the ovipositing criteria in line with NBDC (2015)
Amphibian	Habitat Suitability survey	Within 50m of the wind farm footprint	Record any evidence of suitable habitat within the immediate surrounding area of the Project.
	Night activity surveys	Any sections identified during suitability surveys	Target only the likely areas where individuals are likely to be present based on suitability results.
Reptiles	Habitat Suitability and return activity visits	Within 50m of the wind farm footprint	targeted observation of basking behaviour in suitable microhabitats

1.6 Scoping of Important Ecological Features (IEFs)

Species of varying ecological importance are expected to be present on site and within the receiving environment of the Proposed Development. Following the desk and field study efforts, ecological value was assigned based on a species' presence on site and its conservation or protected status. Reasoning and conclusions are provided in **Section 4** with a summary table of IEFs scoped in provided in **Section 4.1**. **Table 1.2** provides the criteria used to assign ecological importance of (e.g., **International, National, County, Local**) based on NRA (2009b) and in consideration of the more recent CIEEM guidance for Ecological Impact Assessment (EcIA) is provided in **Table 1.1** (CIEEM, 2024).

Table 1.2: Determination importance of IEFs, as set out in NRA Guidance.

Resource Evaluation	Criteria
International Importance	• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation; • Proposed Special Protection Area (SPA) or Important Bird Area (IBA). Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network; • Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972); • Biosphere Reserve (UNESCO Man & The Biosphere Programme). Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979); and • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
National Importance	• Site designated or proposed as a Natural Heritage Area (NHA); • Statutory Nature Reserve; • Refuge for Fauna and Flora protected under the Wildlife Acts; • National Park; • Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); and • Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance	• Area of High Amenity, or equivalent, designated under the County Development Plan; • Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex

Resource Evaluation	Criteria
	II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list; • County important populations of species, viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared; and • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (Higher Value)	• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; and • Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list.
Local Importance (Lower Value)	• Sites or features containing non-native species that is of some importance in maintaining habitat links.

2 METHODOLOGY

2.1 Desk Study

A review of the NPWS Protected Species Database and the National Biodiversity Data Centre (NBDC) Ireland website was conducted for the R08 and R18 10km Irish grid squares, within which the Proposed Development is located, to ascertain the presence or absence of invertebrates, reptile and amphibian species.

Status of amphibian and reptile species found in Ireland were sourced from the NPWS red list report to inform their conservation status and population trends (King *et al.*, 2011).

NPWS was also consulted for sensitive receptors present within the ZoI. Potential Annex II species listed as Qualifying Interests under any of the designated sites within 15km were also considered as potential receptors in the study area if suitable habitat was present to indicate potential presence within the Proposed Development area.

2.2 Field Study

Surveys were conducted within the study area which included a focus on species of moderate and high conservation concern such as marsh fritillary, amphibians and reptiles.

Surveys followed appropriate survey methodologies outlined by the '*Amphibian Monitoring Survey*' and '*National Reptile Survey'* (Amphibian and Reptile Conservation Trust (ARC), 2021a; 2021b), '*Marsh Fritillary Monitoring Scheme* (NBDC, 2015)' and the NRA guidance (NRA, 2005) respectively. Field survey methodologies are described in the sections below.

All surveys shared the same study area of the mammal survey efforts (**Figure 2.1** and **Figure 2.2; EIAR Appendix A08-05**).

2.2.1 Marsh fritillary

'*Ecological Surveying Techniques for Protected Flora and Fauna During the Planning of National Road Schemes* (NRA, 2008b)' were followed when carrying out surveys. Walkover surveys were conducted to determine the presence and suitability of habitats for invertebrates. A general suitability survey was carried out during habitat surveys which included an assessment of suitability for invertebrate species, including marsh fritillary, based on vegetation composition and structure.

Surveys were conducted in September 2022 for marsh fritillary and during the 2022/2023 winter period for suitability general walkover surveys. The field survey methodologies are described in the sections below.

Surveys for marsh fritillary involve visiting any suitable habitat within the area of works and identifying, if there is any, the abundance of the butterfly's food plant, devil's-bit scabious (**Figure 2.1**). Any devil's-bit scabious were checked for larval webs around the base of the plant, where the larva will be visible within a web-like material. Occupied webs are counted and then recorded. These surveys are conducted in late August and September when webs will be most conspicuous and prior to the larva entering hibernation. Criteria followed NBDC (2015) guidance on surveying for Marsh Fritillary.

Details recorded included location, host plant species presence, habitat condition and any evidence of larva presence (larval webs, eaten host plant leaves) (**Table 3.5**). This information was used to inform the invertebrate baseline data.

2.2.2 Amphibians

Initial surveys of habitats and mammals overlapped searches for the amphibian target species and were conducted simultaneously. Surveys followed the '*Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes' (NRA, 2008a)* and '*Guidelines for Treatment of Otters During Construction of National Road Schemes*' (NRA, 2006) with regards to field study area, 50m and along watercourses. Watercourse edges were observed for signs of amphibians during mammal and habitat surveys. This was conducted in 2022.

Targeted surveys following ARC (ARC, 2021a) protocol were conducted in 2024. Amphibian surveys commenced with the undertaking of a preliminary habitat suitability survey (**Figure 2.2**). This was carried out during daylight hours on the 21st of June 2024 where the surveyor located suitable waterbodies for amphibians to breed in.

Upon completion of this suitability survey, a nighttime activity survey was conducted which saw two surveyors return to previously identified suitable waterbodies in search of evidence of breeding amphibian activity. Activity surveys were conducted on the night of the of 4th July 2024 and 24th July 2024. Additional nights were not required as surveys yielded sightings of adults and spawn.

List of survey efforts, results and incidental sightings are provided in **Section 3.2.2.**

2.2.3 Reptiles

Reptile surveys were conducted on May 27th, June 21st, July 4th and 24th and September 16th 2022. These involved walking chosen routes along suitable habitats, observing natural habitats suitable for basking and leaving black mats in areas to encourage basking (scrub, heath, tall grass) (**Figure 2.3**). The artificial black mats were left out prior to monitoring efforts to reduce the potential for disturbance to impact sightings. The mats were revisited throughout the survey period during Vantage point and other site surveys to check for any incidental sightings.

Surveys followed the best practice methodology adapted from the '*National Reptile Survey'* (ARC, 2021b). Efforts also involved a search for evidence of reptiles during mammal and habitat surveys, such as droppings and visual sightings. A list of survey efforts, results and incidental sightings are provided in **Section 3.2.3.**

2.3 Constraints and Limitations

There are a number of limitations inherent to field-based surveying, in particular for invertebrate, amphibian and reptile surveys. These relate to availability of suitable weather conditions for completing surveys with good visibility in suitable weather conditions (e.g. temperature, humidity, low wind) for species activity and detection. As such, when undertaking and completing fieldwork, careful consideration and planning was made to ensure optimal weather conditions during survey periods. Due to the nature of the survey methodology, access to all areas within the ZoI was not always possible due to safety issues. Where areas were inaccessible for walkovers to be conducted, these

areas were noted as such in field reports. No such issues impacted the survey methodology guidance significantly.

The elusive and inconspicuous nature of the target species listed in **Section 2.2** limits the ability to conclude that a lack of observations of these species during survey efforts means they are not present. As such, where suitable habitat is present for these species, this report acknowledges the potential for the relevant species to be present within those suitable habitat areas. The data presented in this report was collected in optimal weather conditions during autumn 2022, winter 2022/2023 and summer 2024.

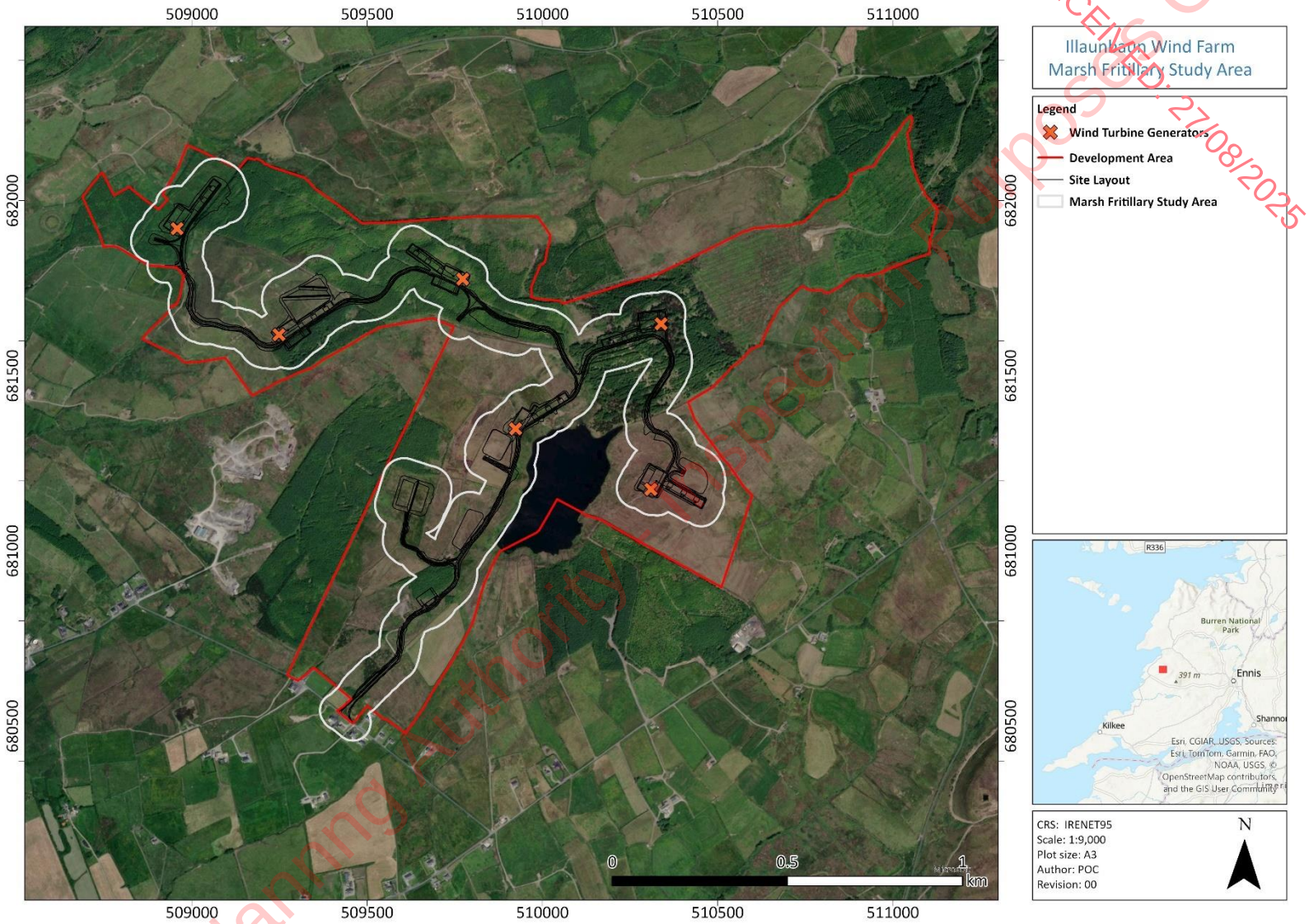

Figure 2.1: Illaunbaun Wind Farm Marsh Fritillary suitability survey results overview.

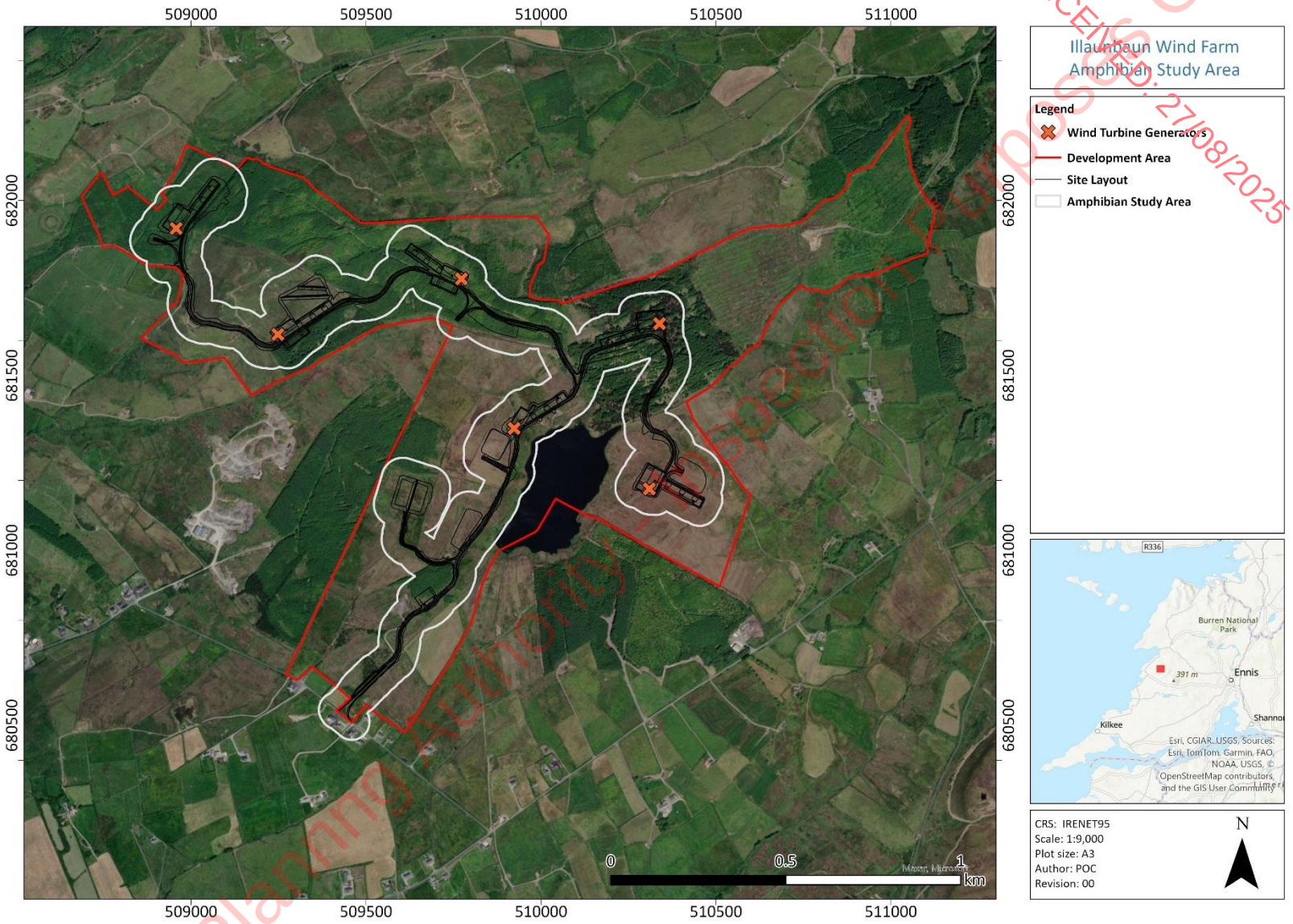

Figure 2.2: Illaunbaun Wind Farm Amphibian *Study Area*

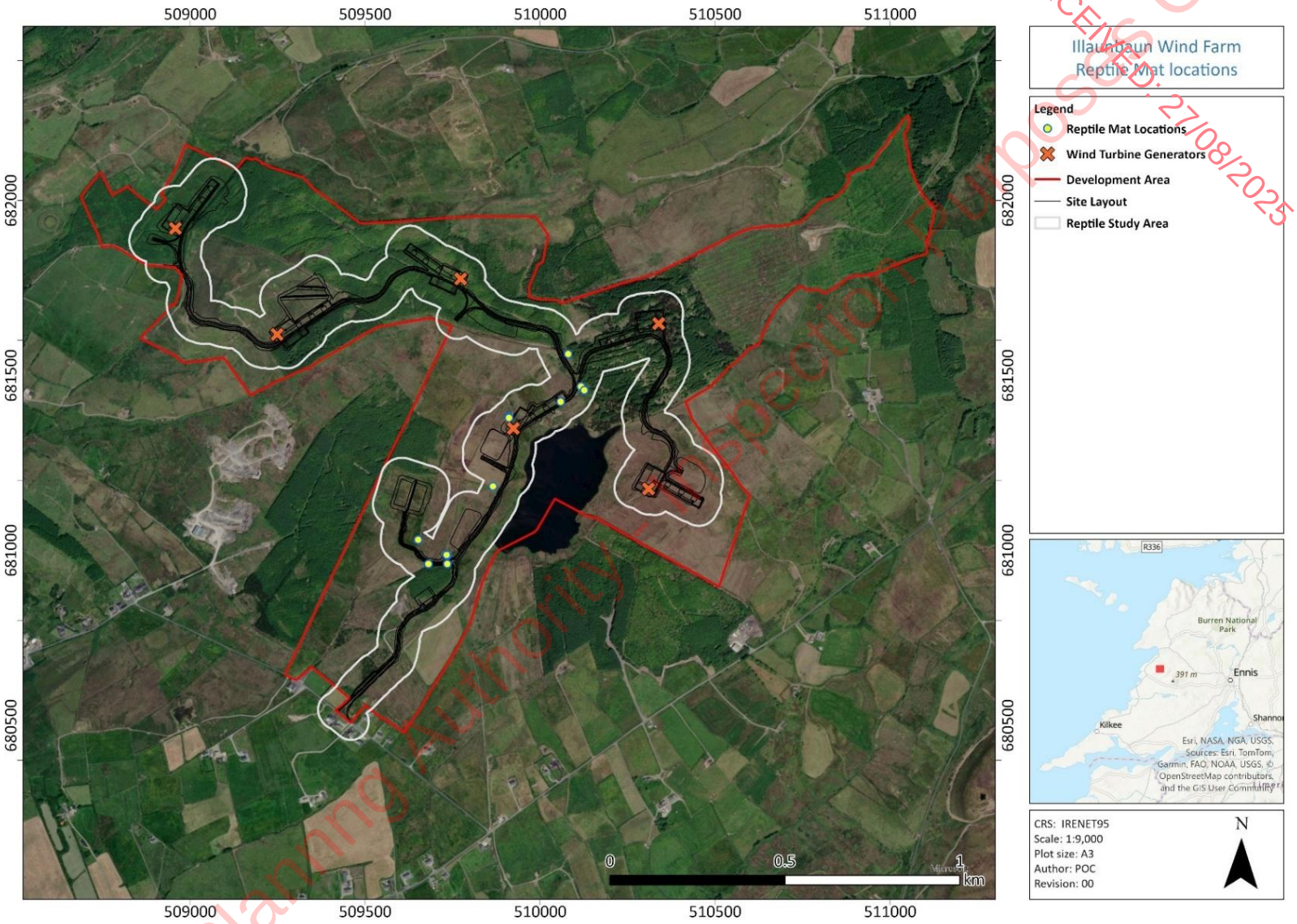

Figure 2.3: ***Illaunbaun Wind Farm Reptile mat locations and Study Area.***

3 RESULTS

3.1 Desk Study

Invertebrate, amphibians and reptiles recorded within the R08 and R18 10km grid squares are shown respectively in tables below.

Table 3.1: *NBDC records of Invertebrate, amphibians, reptiles species in R08 Grid Square.*

Species group	Species name	Record count	Date of last record	Designation
Insect - butterfly	Marsh fritillary (*Euphydryas aurinia*)	120	13/07/2018	Protected Species: EU Habitats Directive >> Annex II || Threatened Species: Vulnerable
Amphibian	Common frog (*Rana temporaria*)	3	15/02/2006	Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts
Amphibian	Smooth newt (*Lissotriton vulgaris*)	1	09/12/2014	Protected Species: Wildlife Acts
Reptile	Common lizard (*Zootoca vivipara*)	1	25/03/2018	Protected Species: Wildlife Acts

Table 3.2: NBDC records of Invertebrate, amphibians, reptiles species in R18 Grid Square.

Species group	Species name	Record count	Date of last record	Designation
Insect - butterfly	Marsh fritillary (*Euphydryas aurinia*)	3	31/12/2010	Protected Species: EU Habitats Directive >> Annex II || Threatened Species: Vulnerable
Amphibian	Common frog (*Rana temporaria*)	10	23/04/2023	Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts
Reptile	Common lizard (*Zootoca vivipara*)	7	01/06/2020	Protected Species: Wildlife Acts

Marsh fritillary, amphibian and reptile presence is considered to be indicated within the ecological baseline of the Proposed Development based on the records within the two associated 10km grid squares. The nearest European site that lists the only Annex II species, marsh fritillary, (East Burren Complex SAC)[1] is greater than 16.5km from the Proposed Development and greater than 15km from the nearest project element. Given the distance and absence of habitat corridors, functional connectivity is considered unlikely. None of the native amphibian or reptiles present are Annex II

[1] NPWS (2022) CO001926.pdf

species but are protected under the Wildlife Acts. The population trends of Irelands native amphibians are not fully known but they are considered vulnerable to impacts from projects that affect suitable habitat zones (King *et al.*, 2011)

The Consultation with NPWS yielded no areas of importance for amphibian or reptilian species within the two grid squares. There are historical common frog records in the Milltown Malbay area.

The majority of the marsh fritillary records relevant to the Proposed Development are from within the R08 grid square (120 records) and from the NPWS consultation, these records refer to an area of habitat present on the peninsula west of Lahinch Town.

The full distribution of these species is not fully known and as such, at the desk study stage they cannot be ruled out from potentially residing closer to or within the area of the Proposed Development.

3.2 Field Study

3.2.1 Marsh Fritillary

Marsh fritillary larval webs were not recorded during surveys. Three locations within the study area were identified for having some potential to support marsh fritillary due to presence of its host plant (Devil's-bit scabious), but all three were not of high suitability due to the extent of poaching by cattle, or scarcity of the larval food plant (**Table 3.3, Figure 3.1**).

Table 3.3: ***Marsh fritillary Suitability Results***

Date	Map Section	No. occupied webs	Transect Length (m)	Abundance of Devil's-bit Scabious	Average vegetation height (cm)	Animal Poaching
29/09/2022	(**Figure 3.2**)	0	100 m	Frequent	12 to 25cm	Majority of site poached
29/09/2022	(**Figure 3.2**)	0	100 m	Patchy Sparse	12 to 25cm	Majority of site poached
29/09/2022	(**Figure 3.2**)	0	100 m	Rare	12 to 25cm	No livestock hoof marks

No designated sites within the 15km ZoI of the Proposed Development list marsh fritillary as a Qualifying Interest. Due to their protected status under the Habitats Directive and the historical records of this species within the overlapping grid squares, the population of marsh fritillary has potential to be present within the surrounding area of the Proposed Development.

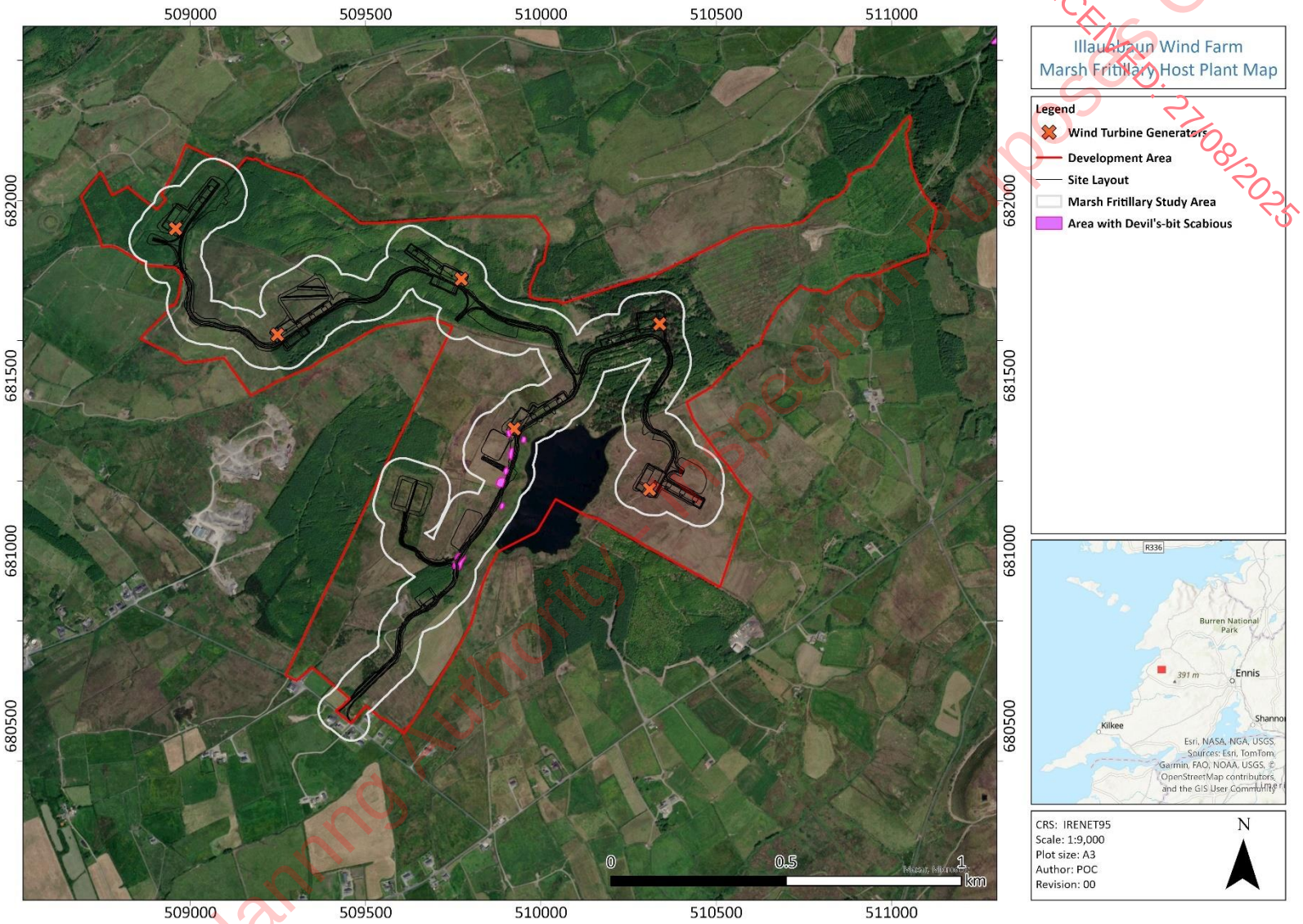

Figure 3.1: *Illaunbaun Wind Farm marsh fritillary results - devil's-bit scabious locations.*

3.2.2 Amphibians

Common frog was recorded 13 times within the two 10km grid squares (NBDC, 2025) that the Proposed Development is located within.

Due to the extent of resident local populations of the common frog, the suitable habitat within the extent of the Proposed Development and the immediate surrounding area, as well as the historical records of this species from NBDC (2025), it is considered likely to be present within the receiving environment.

The Amphibian Suitability Survey took place on the 21st of June 2024 (**Table 3.4**; **Figure 3.3**).

Table 3.4: ***Amphibian Suitability Survey Results.***

Date	ITM Grid Reference		Site Description	Suitability	Comments
	X	Y			
21/06/2024	509591.92	680844.2	Quarry	Suitable	Quarry with waterbodies
21/06/2024	509732.24	680983.05	Quarry	Unknown	Large waterbody, almost all vegetation dead. Activity not seen here while doing VPs in the past. Low suitability
21/06/2024	510054.82,	681395.09	Quarry	Suitable	Shallow waterbodies in quarry
21/06/2024	510025.1	681381.47	Quarry	Suitable	-
21/06/2024	510057.48	681362.07	Wetland	Suitable	Flooded area

Amphibian activity surveys were conducted at night-time on the 4th and 24th of July 2024. Common frog was sighted at two locations within 50m of the Site Layout, a quarry (ITM: 509586.86, 680833.39) and an area of wetland (ITM: 510068.58, 681369.11) on the 4th, and at three locations, a pond (ITM: 510045.01, 681399.18), an area of wetland (ITM: 510074.23, 681385.58), and a ditch (ITM: 509581.41, 680699.07) on the 24th (**Figure 3.3; Table 3.5)**.

Smooth newt was recorded once within the two 10km grid squares (NBDC, 2025) that the Proposed Development is located within. During the amphibian activity survey on the 24th of July 2024, one sighting of smooth newt was observed near the artificial lake located within the boundary of the Proposed Development (ITM: 510041.82, 681395.93) (**Figure 3.3**; **Table 3.5**). A smooth newt was also observed during the initial walkover on the 6th of April 2022. No secondary evidence (eggs, larval stages etc.) was recorded within the Proposed Development.

Incidental records from the aquatics baseline surveys yielded 12 eDNA samples taken across the lake waterbody present within the immediate surrounding area (Lough Keagh) that tested positive for smooth newt (See **Appendix A08-06** for details on methods and data results). This reinforces the evidence that this species is using the suitable habitat present within the immediate surrounding area of the Proposed Development.

Due to the elusive nature of this species, the suitable habitat and the positive eDNA test from lough Keagh, smooth newt is considered likely to be present within the receiving environment.

Table 3.5: *Amphibian Activity Survey Results*

Date	Survey Type	ITM	Site Type	Site Suitability	Species	Life stage Observed	Spawn Count	No. of adults	Comments
04/07/2024	Amphibian Activity	509586.86, 680833.39	Quarry	Suitable	Common Frog	Froglet/Toadlet	1-10	1	Nymph moult found also
04/07/2024	Amphibian Activity	509729.43, 680985.57	Pond	Suitable	Nil Sightings				
04/07/2024	Amphibian Activity	510056.13, 681429.26	Pond	Suitable	Nil Sightings				
04/07/2024	Amphibian Activity	510047.6, 681388.84	Pond	Suitable	Nil Sightings				
04/07/2024	Amphibian Activity	510026.38, 681375.76	Pond	Suitable	Nil Sightings				
04/07/2024	Amphibian Activity	510068.58, 681369.11	Wetland	Suitable	Common Frog	Froglet/Toadlet		1	Froglet moving around in flooded area
24/07/2024	Amphibian Activity	509737.82, 680977.3	Pond	Not Suitable	Nil Sightings				
24/07/2024	Amphibian Activity	510057.38, 681428.65	Pond	Suitable	Nil Sightings				
24/07/2024	Amphibian Activity	510045.01, 681399.18	Pond	Suitable	Common Frog	Froglet/Toadlet		2	Two froglets at pond edge in old quarry
24/07/2024	Amphibian Activity	510041.82, 681395.93	Pond	Suitable	Smooth Newt	Adult		1	Newt which has been predated on
24/07/2024	Amphibian Activity	510012.03, 681376.6	Pond	Suitable	Nil Sightings				
24/07/2024	Amphibian Activity	510074.23, 681385.58	Wetland	Suitable	Common Frog	Froglet/Toadlet		1	Hopping through grass beside flooded area
24/07/2024	Amphibian Activity	509596.1, 680820.77	Pond	Suitable	Nil Sightings				
24/07/2024	Amphibian Activity	509581.41, 680699.07	Ditch	Suitable	Common Frog	Adult		1	Adult hopping in ditch beside VP3

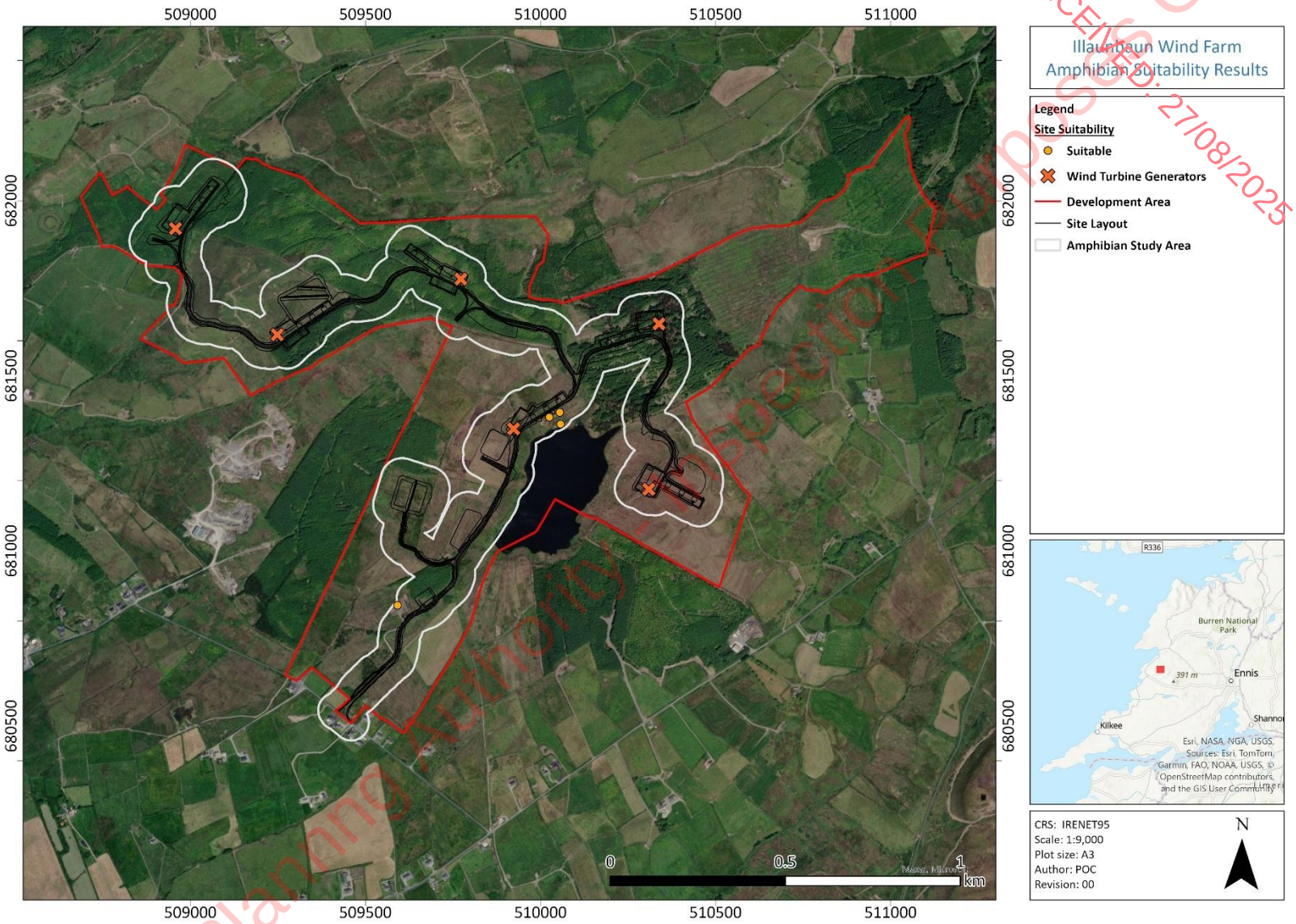

Figure 3.2: ***Illaunbaun Wind Farm Amphibian Suitability Results.***

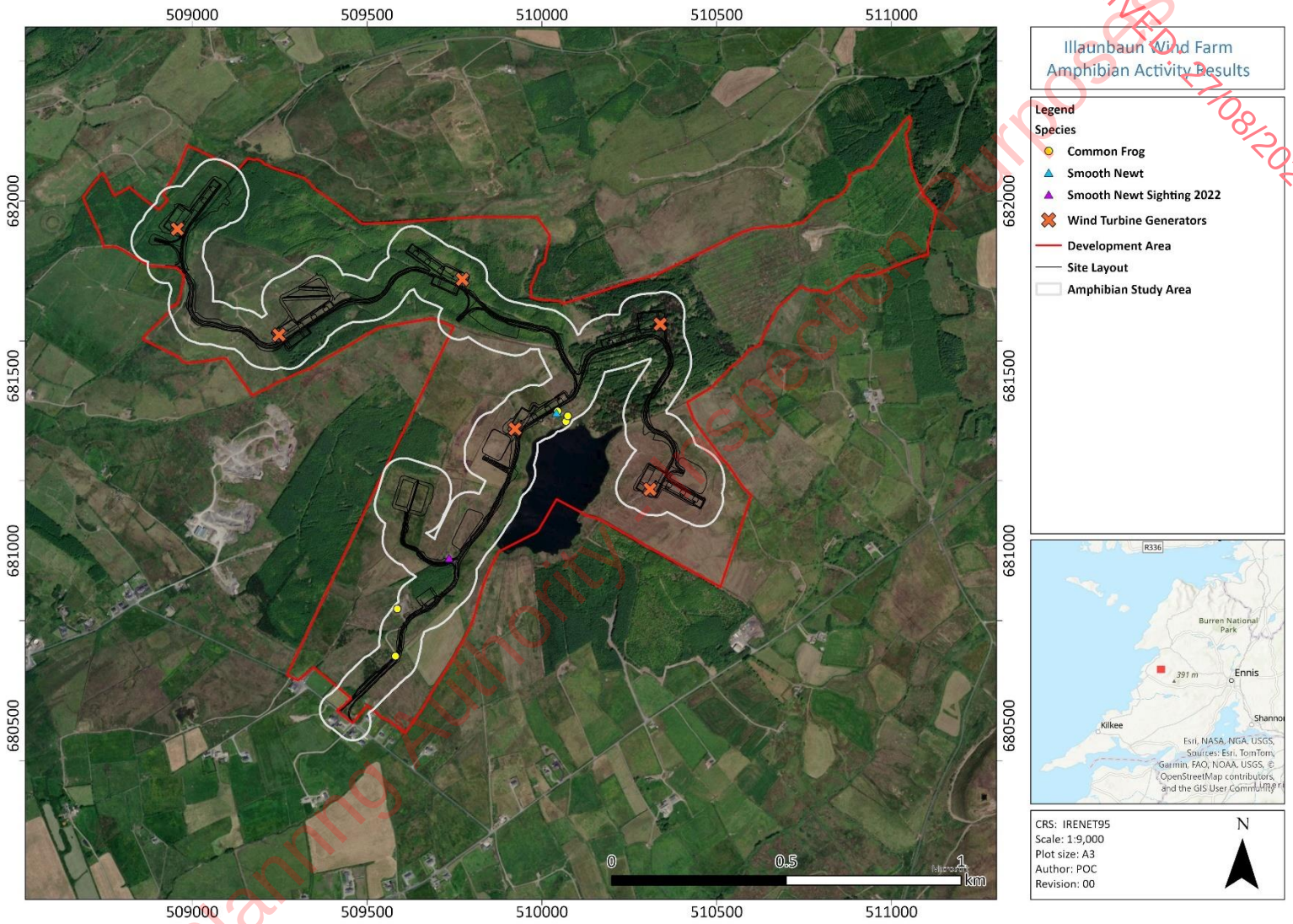

Figure 3.3: ***Illaunbaun Wind Farm Amphibian Activity Results.***

3.2.3 Reptiles

Common lizard was not recorded during the ecological surveys. The only records for this species are the eight desk study records from within the two 10km grid squares (NBDC, 2025) that the Proposed Development is located within. Due to the extent of forestry, including conifer plantation and mixed woodland, scrub, treelines, and hedgerow within the area of the Proposed Development and immediate surrounding area, it is considered that there is suitable habitat for this species. The species is listed under the Wildlife Act (2023), and it is considered likely that common lizard is more abundant within the study area and surrounding habitats than the negative survey results suggest.

Reptile surveys were conducted on the 27th of May, 21st of June, 4th of July, 24th of July and 16th of September. No Reptiles were observed during any of these survey efforts (**Figure 3.4**).

3.2.1 Other Receptors

No observations of any additional receptors of conservation concern were observed during the survey efforts detailed in this report.

4 DESCRIPTION OF THE BIODIVERSITY BASELINE

Due to the nature of the survey methodology and the elusive behaviour of some of the species indicated to be present by the desk study data, surveys yielding no sightings, but suitable habitat were weighted with the likely presence of species no recorded during surveys. This informed the conclusion of which species should be scoped in as Important Ecological features. See **Section 4.1** for summary of IEFs.

4.1 Marsh fritillary

Marsh fritillary is the only Irish butterfly listed under Annex II of the EU Habitats Directive in Ireland.

The lack of observations of marsh fritillary arising from the survey efforts suggests a low presence of this species within the ecological baseline of the Proposed Development. Marsh fritillary was sighted on 123 occasions within the two 10km grid squares (NBDC, 2025) within which the Proposed Development is located.

There are limited areas of suitable habitat present for this species within 50m of the Proposed Development site boundary. These areas were mostly poached by cattle or had no signs of regular grazing which contributes to suitable marsh fritillary vegetation mosaics. As such it is highly unlikely this species is present within the Proposed Development. However, due to its EU Habitats Directive status, the inconspicuous nature of larval webs and the meta-population distribution of this species, marsh fritillary is considered an IEF for detailed consideration in the impact assessment under the precautionary principle where this species may colonise the suitable habitats in the future.

4.2 Amphibians

4.2.1 Common frog

Common frog is one of the more widely distributed native amphibian species in Ireland. Common frog is an Annex V species under the EU Habitats Directive but is considered stable in Ireland. There is ample suitable habitat to support common frog within the Proposed Development area. Common frog was sighted five times across two dates during the activity surveys. Based on this and its conservation status, common frog is considered an IEF.

4.2.2 Smooth newt

Smooth newt is also one of the more widely distributed native amphibian species in Ireland. Smooth newt is not listed under the Habitats Directive but is an important indicator species for healthy aquatic and transitional habitats. There is ample suitable habitat to support smooth newt within the Proposed Development area. There was one sighting of smooth newt during the activity surveys and one incidental sighting of smooth newt near the small artificial lake located southeast of wind turbine T4 (**Figure 3.4**). Incidental eDNA results from Lough Keagh yielded strong positive presence of smooth newt. Thus, based on confirmed visual sightings and positive eDNA detections, this species is likely to be present within the Proposed Development and immediate surrounding areas. As such, it is considered to be an IEF.

4.2.3 Reptiles

During the desk study, common lizard was recorded once within the R08 10km grid square in 2018, and once within R18 in 2020. This species is Ireland's only native reptile species, with a population that is considered relatively stable and widespread across the country (NBDC, 2025). Its presence within the Proposed Development was not confirmed during survey efforts. Despite the absence of records within the study area during survey efforts, due to its legal status and the inconspicuous nature of this species, common lizard is nonetheless considered an IEF under the precautionary principle.

4.3 Summary of IEFs

A total of four species are considered as IEFs in relation to the Proposed Development. The full list of receptors and the scoping of IEFs are provided below in **Table 4.1**, below.

Table 4.1: Scoping of Important Ecological Features.

Species	Legislation	Importance for Receiving Environment	Scoped In/Out as Important Ecological Features
Marsh fritillary	EU Habitats Directive Annex II; Bern Convention II	**County**	In
Common frog	Habitats Directive V; Bern Convention III; Wildlife Acts 2023	**Local (High value)**	In
Smooth newt	Bern Convention III; Wildlife Acts 2023	**Local (High value)**	In
Common lizard	Bern Convention III; Wildlife Acts 2023	**Local (High value)**	In

Based on the contemporary survey and desk study data, the above scoping of important ecological features, based on the most recent scientific data, is considered to reflect the current baseline for invertebrates, amphibians and reptiles which should be assessed with regard to the potential lifetime impacts of the Proposed Development.

The 'future baseline' (i.e., the baseline we would expect without the development scenario) describes the invertebrate, amphibian and reptiles features as they would be in the opening year/year of operation, in the absence of the Proposed Development and would be expected to remain in the 'Do Nothing Scenario'. They are influenced by future developments and factors that have a high degree of uncertainty, such as future land management and climate change. Where information exists on planned future developments, this will be taken into consideration during the assessment.

Long-term climatic predictions suggest that warmer, wetter winters and drier summers will become more frequent, with more extreme weather events likely. Combined with changes in land management, increased urbanisation and increased biotic pressures, climate change may lead to an increase in the national, regional and local populations and distributions of some of these receptors but a decrease in other species. However, such changes are unlikely to be material during the intervening period between the time when the field surveys were undertaken to inform this assessment and the first year of operation of the Proposed Development.

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