

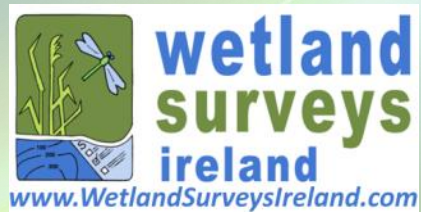
INCHAMORE WINDFARM, KERRY SLUG SURVEYS

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Prepared for:

BioSphere Environmental Services

By:



Wetland Surveys Ireland Ltd.

Bell Height

Kenmare

Co Kerry

T: + 353 86 8510292

E: info@WetlandSurveysIreland.com

www.WetlandSurveysIreland.com

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1 INTRODUCTION

Wetland Surveys Ireland Ltd. were commissioned by BioSphere Environmental Services to undertake a survey for the presence of Kerry Slug (*Geomalacus maculosus*) within a proposed wind farm site at Inchamore, County Cork. The extent of the proposed site is ca 170.1 ha and occurs and straddles the County Cork and Kerry boundary approximately 6km to the west of Ballyourney, Co. Cork. The survey was undertaken to inform the assessment of potential ecological impacts of the proposed wind farm and devise appropriate mitigation as may be required.

The occurrence of the wind farm within the known range of Kerry Slug (*Geomalacus maculosus*) together with the presence of suitable habitat throughout the site suggested the likely presence of the species.

1.1 KERRY SLUG

The Kerry slug (*Geomalacus maculosus*) is protected by the Wildlife (Amendment) Act 2000. It is listed under Annex II of the Habitats Directive and seven Special Areas of Conservation (SACs) have been designated for the species with a combined total area of approximately 95,337 hectares. The Kerry slug is also listed in Annex IV of the Habitats Directive and as such is strictly protected from injury, or disturbance / damage to their breeding or resting place wherever it occurs.

Historically, the Kerry Slug has been considered to be restricted to Devonian Old Red Sandstone areas of Kerry and West Cork where it occurs most commonly in either of three distinct habitats:

- deciduous woodlands in particular those with rocky outcrops or boulders;
- rock outcrops associated with heath or blanket bog; and
- lake shores

Within these habitats, the species tends to only be present if there is outcropping Devonian Old Red Sandstone, humid conditions and lichen, liverwort and / or mosses in which the species shelters and feeds (Platts and Speight 1988).

However, the species has also been recently discovered on both granite outcrops within blanket bog and from a Conifer plantation in County Galway (Kearney 2010). Further records of the species from Conifer Plantations suggest that this may also be a suitable habitat for the species (McDonnell *et al.* 2013). A possible explanation put forward to explain the recent discovery of the species in County Galway is an inadvertent introduction (during forestry operations) (McDonnell *et al.* 2013). However this has not yet been determined (Reich *et al.* 2012).

Like many slug species, Kerry Slug is a crepuscular animal and it takes refuge in crevices under rocks or bark (in woodlands) during daylight hours. The species are also known to be diurnal during and after periods of rain and in saturated conditions. Adult slugs vary in colour from black and white spots to brown with cream spots, brown individuals tend to occur in woodland habitats. The black form is found in open habitat such as bogs and heathland. Studies have shown that the species can be abundant on conifer trees and can recolonise boulder habitat when the wood is clearfelled.

The overall conservation status of the species has been reported as 'favourable and improving' and it is not currently considered threatened within its range (NPWS 2019).

A review of data held by the National Biodiversity Data Centre (September 2021) confirms that the species has previously been reported from the 10km square that the site intersects (W17). The proposed wind farm is not located within any site designated for nature conservation. The nearest site designate for the protection of Kerry Slug is the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (NPWS Site Code: 0365).

Based on the habitats recorded during the ecological assessment of the proposed wind farm, the following potentially suitable habitats have been identified:

- wet heath and rock outcrop habitat present throughout much of the site.

2 STUDY AREA

The study area is confined to an upland site proposed for wind energy development. From an initial review of habitats present in the area it was determined that there was a high probability of Kerry Slug occurrence. This conclusion was based on the geography of the site, habitat types present, and the known Kerry Slug distribution (NPWS 2019). A brief summary of the study area is presented in the following section.

2.1 INCHAMORE PROPOSED WIND FARM

The Inchamore site occurs approximately 6km west of Ballyvourney in west Cork. The site is accessed by a private road that occurs within the southern section of the site. The main habitats within the proposed development site include conifer forestry (WD4), wet heath (HH3), and acid grassland (GS3) which is grazed by cattle and sheep. Much of the conifer forestry within the site comprises mature stands of sitka spruce (*Picea sitchensis*) which mostly occur within the eastern, western, and southern sections of the site. Wet heath with frequent rock outcropping (ER1) occurs within the central and northern sections of the site. The wet heath and outcropping rock provide high value habitat to Kerry Slug. Mature conifer forestry may provide limited opportunities for Kerry Slug. The extent of the Inchamore site boundary is illustrated in

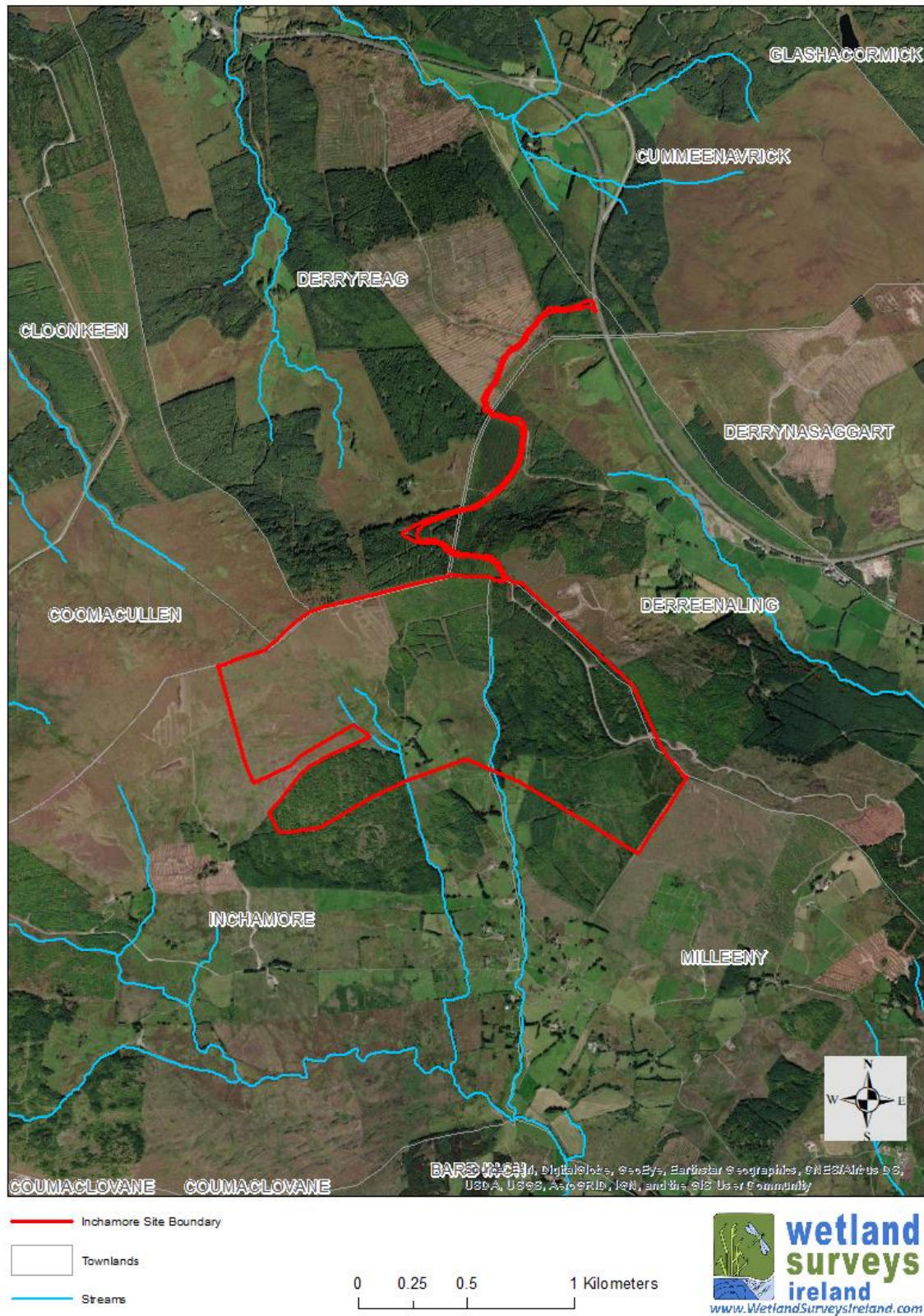


Figure 1: Inchamore site boundary overlain on aerial imagery.

3 METHODOLOGY

3.1 DESKTOP REVIEW

A desktop assessment including a review of previous records of Kerry Slug within and surrounding the study area was undertaken, the results of which are presented in Section 2.1 above.

3.2 FIELD SURVEYS

There are three main survey approaches that are used to survey for Kerry Slug. These include hand searching techniques (diurnal or nocturnal) and live refuge trapping (metric traps). The method used during the current survey is live refuge trapping as recommended for use by McDonnell *et al.* (2013). This method is favoured over other techniques because it enables quantitative sampling (McDonnell and Gormley 2011a,b). In addition, it removes the requirement of undertaking searches during wet weather (in the case of diurnal searches), and the health and safety risks associated with nocturnal searches in remote locations. The metric trap method involves the following:

- **Metric traps.** This is a refuge trap technique. The metric traps (0.25 m²), manufactured by De Sangosse (Pont du Casse, France), are made up of absorbent material covered with a reflective upper surface and a black perforated plastic on the underside. They are wetted in advance of being laid out and are baited with Carrot. Traps are secured to rock outcrops (outcrop metric traps) or on surface vegetation (in the case of heath) using stones, tent pegs, or nails as appropriate. They can also be wrapped around tree trunks (banded metric traps) when undertaking surveys at wooded sites (not relevant to current survey). Traps are checked weekly for a period of up to six weeks. If required, traps are re-wetted during site visits using a watering can.

In addition to checking the metric traps, incidental observations of Kerry Slug were recorded during each site visit following hand searches amongst suitable habitat. A summary of the dates, methods, and weather conditions of each site visit undertaken are presented in Table 1.

Table 1: Survey effort at Inchamore.

Date	Site	Survey	Weather
23/07/2020	Inchamore	Hand searches and set traps	Light rain, wet conditions on site.
30/07/2020	Inchamore	Hand searches and check traps	Light persistent rain. Mild and calm.
13/08/2020	Inchamore	Hand searches and check traps	Light rain. Warm
20/08/2020	Inchamore	Hand searches and remove traps	Heavy showers, bouts of strong wind.

After an initial site walkover, the occurrence of suitable Kerry Slug habitat was identified and seven metric traps (Plate 1 below) were deployed amongst wet heath and outcropping rock. The traps were deployed on the 23rd of July 2020 and subsequently checked on three separate occasions with at least a weekly interval before being removed four weeks later. The location of each trap is summarised in Table 2 and illustrated in Figure 2 below.



Plate 1: Slug trap on rock outcrop.

Table 2: Trap locations and habitats at Inchamore.

Trap	Location (ITM)	Habitat
Trap 1	512468, 578335	Rock outcrop (ER1) in wet heath (HH3) adjacent to a stone wall.
Trap 2	5124181, 578354	Rock outcrop (ER1) in wet heath (HH3) adjacent to a stone wall.
Trap 3	512460, 578537	Rock outcrop (ER1) in wet heath (HH3)
Trap 4	512405, 578583	Rock outcrop (ER1) in wet heath (HH3)
Trap 5	512406, 578594	Halved on wet heath (HH3) and rock outcrop (ER1)
Trap 6	512331, 578672	Halved on wet heath (HH3) and rock outcrop (ER1)
Trap 7	512482, 578615	Rock outcrop (ER1) in wet heath (HH3)



Figure 2: Slug trap locations at Inchamore.

4 RESULTS

Kerry Slug were regularly recorded amongst suitable habitat during each visit. Kerry Slug numbers recorded within slug traps were relatively low with just 19 records in seven traps over the four week period. Individuals were also recorded along a traditional stone wall that occurs along the southern boundary of the heath and adjacent mature conifer forestry. Kerry Slug were frequently recorded within suitable habitat during targeted hand searches. Slugs were most commonly encountered from exposed rock during hand searches, with most hand search observations made during wet weather (see Plate 2). A summary of all records observed at the site is presented in Table 3. The individuals recorded were largely confined to rock outcrops within wet heath. The total number of slugs recorded at the site was 149 individuals, 130 of which were from hand searches.

Table 3: Results of metric trap surveys and targeted hand searches at Inchamore.

Date	Task	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Trap 6	Trap 7	Hand Searches	Total
23/07/20	Set Traps	NA	NA	NA	NA	NA	NA	NA	32	32
30/07/20	Check Traps	5	4	2	0	0	0	3	80	94
13/08/20	Check Traps	1	2	2	0	0	0	0	14	19
20/08/20	Check & remove	0	0	0	0	0	0	0	4	4
Total		6	6	4	0	0	0	3	130	149



Plate 2: Kerry Slug recorded during targeted hand searches.

5 DISCUSSION AND RECOMMENDATIONS

Results from the current survey confirm the presence of Kerry Slug within the proposed wind farm site. These results also suggest a notable preference for exposed siliceous rock. This is in line with previous surveys undertaken amongst similar habitat complexes (McDonnell and Gormley 2011a). The species is thought to be widespread throughout suitable habitat within its known range (NPWS 2019).

The development of the wind farm could potentially impact on the local population of Kerry Slug due to loss and disturbance of suitable habitat. Based on the likely extent of habitat loss throughout the wind farm site, this impact is likely to be minor and localised as only a very small proportion of suitable Kerry Slug habitat within the site will be impacted. During construction, works could also result in the death of low numbers of Kerry Slug due to machinery movements in areas of suitable habitat.

The following measures are recommended to minimise the above potential impacts on the local Kerry Slug population:

- Areas of suitable habitat that occur outside of the footprint of the development should be avoided during the course of construction thereby minimising the loss and disturbance of Kerry Slug habitat.

- Immediately prior to undertaking works in areas of suitable habitat, the project ecologist will check for the presence of Kerry Slug. Should slugs be discovered then they will be transferred to suitable habitat in the surroundings. Similar on-going monitoring of suitable habitat within works areas should continue throughout the construction phase. Such monitoring should be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery.
- Due to the unavoidable disturbance to Kerry Slug habitat, a derogation license will be sought from the NPWS prior to the commencement of construction. Works will be carried out in compliance with any conditions set by such the license.

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