

# Appendix 6-8

## Kerry Slug Survey



# **Kerry slug Survey**

## **Carrownagowan Wind Farm**



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**Appendix 1:** Correspondence with NPWS/Licence application

**Appendix 2:** NPWS Licence C207/2018



## 1 INTRODUCTION

Malachy Walsh and Partners (MWP) were commissioned by Coillte Cuideachta Ghníomhaíochta Ainmnithe, hereafter Coillte, to carry out a Kerry slug (*Geomalacus maculosus*) survey within the proposed wind farm site at Carrownagowan, approximately 6.5km to the northwest of Killaloe, in County Clare. The survey was carried out to determine whether Kerry slug was present within the proposed development site, and if present to gain an understanding of its abundance and distribution throughout the site. The survey will inform the assessment of potential ecological impacts of the proposed wind farm, and devise appropriate mitigation, if required.

The Carrownagowan Wind Farm site is not within the known range of Kerry slug. However owing to recent records of the species in Coillte managed conifer forestry in Co. Galway, a Kerry slug survey was undertaken at the Carrownagowan Wind Farm site which is also Coillte managed forestry.

### 1.1 SITE DESCRIPTION

The Carrownagowan Wind Farm is situated in an upland area (approx. 200-420m OD) which principally consists of conifer plantation (of different age profiles), with sections of upland blanket bog, cutover bog, and wet grassland reverting back from improved agricultural grassland. Forestry operations have impacted the overall drainage regime at the site. The site is drained by a number of 1<sup>st</sup> and 2<sup>nd</sup> order streams, in the upper reaches of catchment area.

### 1.2 ECOLOGY OF KERRY SLUG

Until quite recently, the species had been recorded mainly, or only, on Devonian Old Red sandstone strata that occur in counties Cork and Kerry (Platts *et al.*, 1988). However, in 2010 a population of Kerry slug was observed by MWP ecologists feeding on lichen and on moss-covered granite boulders in Connemara, Co. Galway, adjacent to Galway Wind Park. During subsequent surveys they were also recorded mating on Lodgepole pine trees (*Pinus contorta*) in the Coillte forestry. This was the first time that the species had been recorded outside of its historic range in Ireland, and the first time that the species had been recorded on granite geology (Kearney, 2010). It is possible that the Kerry slug found in County Galway was due to accidental introduction through forestry operations (McDonnell *et al.* 2013).

Kerry slug is protected by the Wildlife Acts 2000 to 2012 and is listed under Annex II and Annex IV of the Habitats Directive. Due to its status as an Annex II species, seven Special Areas of Conservation (SACs) have been designated for this species in Ireland. Additional protection is afforded the species due its status as an Annex IV species, and it is strictly protected from injury, or disturbance or damage to any breeding or resting place wherever it occurs. Therefore, its natural range, or area of occupancy, cannot be reduced.

## 2 METHODOLOGY

### 2.1 DESK STUDY

OSI Grid Squares R67 and R57 which encompass the Carrownagowan Wind Farm are outside the current distribution, current range, and favourable reference range of Kerry slug<sup>1</sup>. A review of the National Biodiversity Data Centre on-line mapping system shows that records of this species within OSI Grid Squares R67 and R57<sup>2</sup> do not exist.

### 2.2 FIELD SURVEYS

During ecology surveys at Carrownagowan Wind Farm, potentially suitable habitats for Kerry slug were identified which included conifer plantation and peatland habitats. It must be noted that very few rocky outcrops were present at the site.

NPWS licenced target surveys were undertaken in suitable habitat in February and March 2019. Refer to Appendix 2 for NPWS Licence No. C207/2018.

#### 2.2.1 Hand Search

Hand searches were completed in nine sites (illustrated in **Figure 1** below). Hand searches in conifer plantation involved checking under carpets of epiphytic bryophytes, examining lichens and mosses on tree trunks, investigating bark, (to a maximum height of approximately 2 m), stumps and rocks, in addition to examining the areas in between these features. In open peatland habitat, rock crevasses and vegetation at the base of rock outcrops were searched (Reich *et al.*, 2012).

Each site was searched for 45 minutes or until Kerry slug was recorded. After 45 minutes of searching, metric traps were installed at each of the nine hand search sites.

#### 2.2.2 Metric Traps

Hand searches did not yield positive results for Kerry slug. Synthetic mats (0.25m<sup>2</sup>), designed to attract slugs, manufactured by De Sangosse (Pont du Casse in France), were deployed at all nine sites. These mats are double-sided LDPE polymer, with one side perforated to absorb heat, and the other side composed of an aluminium coating to reflect heat. The lining of the mats is composed of synthetic wool. The mats were baited with carrot, soaked in water and placed at the nine sites. The mats were pegged to ground surfaces, secured onto trees, or fixed to boulders. Slugs, if present, would typically crawl under these mats, being attracted by the heat and moisture. Following deployment of the Metric Traps, the site(s) were visited weekly, for a period of four weeks. On each visit the mats were examined for evidence of Kerry slug, bait was replenished and the mats were re-moistened.

#### 2.2.3 Weather Conditions

Suitable weather conditions for surveys are cited as being mild, damp and overcast with some showers. Surveys were carried out in suitable weather conditions.

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1

[https://www.npws.ie/sites/default/files/publications/pdf/Article\\_17\\_Print\\_Vol\\_3\\_report\\_species\\_v1\\_1\\_0.pdf](https://www.npws.ie/sites/default/files/publications/pdf/Article_17_Print_Vol_3_report_species_v1_1_0.pdf)

<sup>2</sup> <https://maps.biodiversityireland.ie/Map>



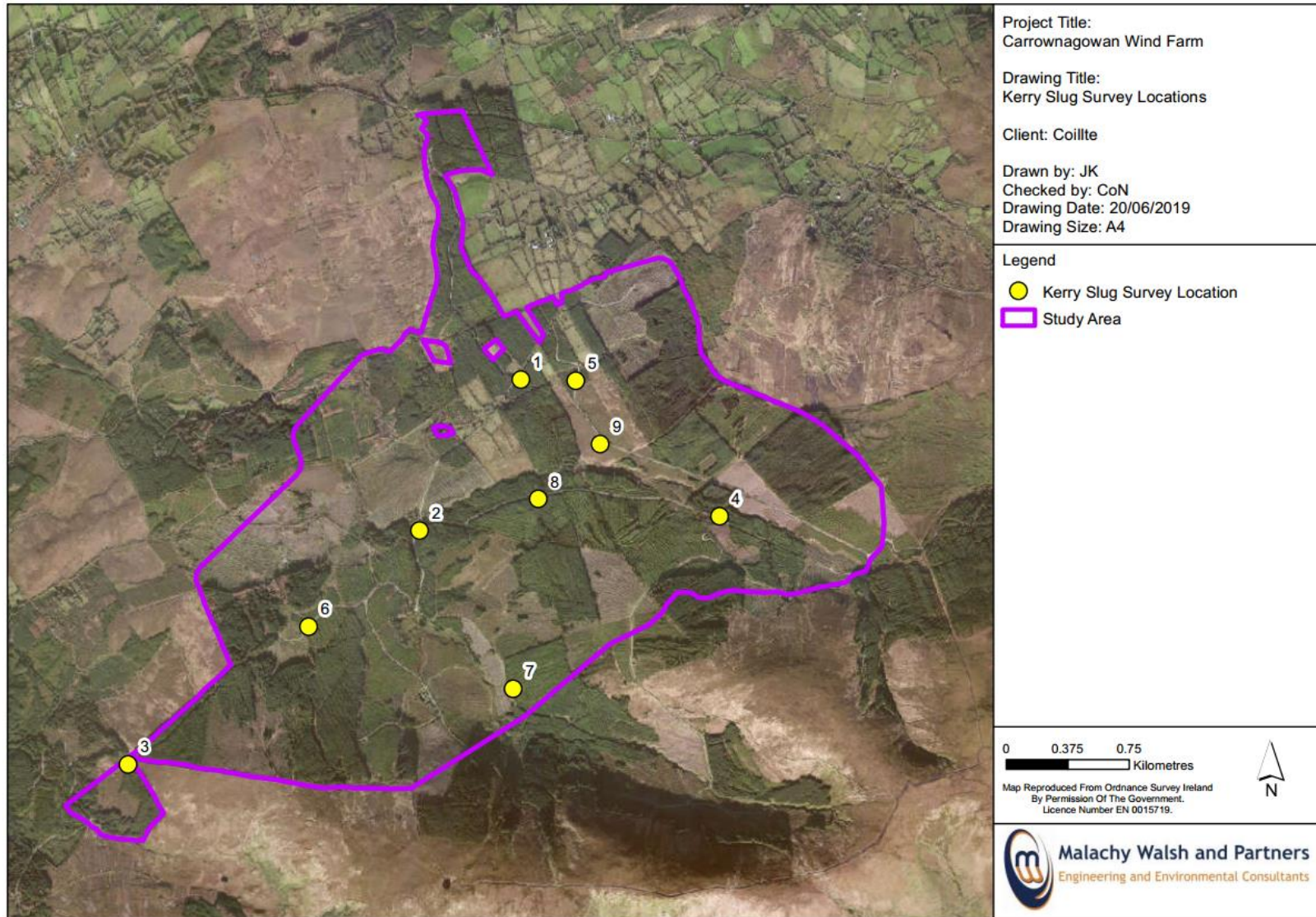


Figure 1: Kerry slug Survey Locations



### 3 RESULTS

Kerry slug Surveys Carrownagowan Wind Farm (2019)						
Date		14-02-2019	21-02-2019	01/03/2019	08/03/2019	22/03/2019
Weather conditions		10°C, 8/8 cloud cover. Damp. Showers. SW>F1	7-9°C, 7/8 cloud cover. Damp wet day. Infrequent showers. SW slight breeze <F1	10°C. Slight mist throughout survey. Calm.	9°C. 8/8 cloud cover. Damp. Some periods of rain. Slight SW breeze (<F1).	10-11°C, 6/8 cloud cover. Light showers. Some sunshine. Calm
Site	GPS	45 minute Search	Site Visit 1	Site Visit 2	Site Visit 3	Site Visit 4
1	561922 678150	<b>No Kerry slug</b> - Placed 6 mats. Mature Conifer Plantation (Sitka spruce) approx. 15m high. Some bryophyte cover on trees, little lichen cover, good moss cover on ground	<b>No Kerry slug.</b> Great Grey Slug/leopard slug ( <i>Limax maximus</i> )	<b>No Kerry slug.</b> Diplopoda Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Diplopoda Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Diplopoda Common Woodlouse ( <i>Oniscus</i> sp.)
2	561304 677229	<b>No Kerry slug</b> - Placed 6 mats. Sitka Spruce, Mature, Thinned, Little/no lichen cover on trees. Floor pine needles, little/no bryophyte cover-dry	<b>No Kerry slug.</b> Diplopoda Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Common Woodlouse ( <i>Oniscus</i> sp.) Pinemarten droppings	<b>No Kerry slug.</b> Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Common Woodlouse ( <i>Oniscus</i> sp.)
3	559525 675800	<b>No Kerry slug</b> - Placed 6 mats. Mature Sitka stand, left after felling. 20m high. Blanket of bryophyte cover on floor. Little bryophyte cover on trees, little/no lichen cover.	<b>No Kerry slug.</b> Great Grey Slug/leopard slug Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Great Grey Slug/leopard slug Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Great Grey Slug/leopard slug Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Great Grey Slug/leopard slug Common Woodlouse ( <i>Oniscus</i> sp.)
4	563134 677317	<b>No Kerry slug</b> - Placed 6 mats. Mature Sitka spruce. Pine needles on floor. Some bryophyte cover, little no lichen cover on trees.	<b>No Kerry slug.</b> Great Grey Slug/leopard slug Diplopoda Numerous woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Deer droppings	<b>No Kerry slug.</b> Great Black Slug ( <i>Arion ater</i> )	<b>No Kerry slug.</b> Numerous woodlouse ( <i>Oniscus</i> sp.)
5	562255 678144	<b>No Kerry slug</b> - Placed 6 mats. Mature Sitka spruce. 20m high. Pine needles on floor. Some bryophyte cover /little/no	<b>No Kerry slug.</b> Tree Slug ( <i>Limax marginatus</i> )	<b>No Kerry slug.</b> Tree Slug ( <i>Limax marginatus</i> )	<b>No Kerry slug.</b>	<b>No Kerry slug.</b> Tree Slug ( <i>Limax marginatus</i> )

Kerry slug Surveys Carrownagowan Wind Farm (2019)						
Date		14-02-2019	21-02-2019	01/03/2019	08/03/2019	22/03/2019
Weather conditions		10°C, 8/8 cloud cover. Damp. Showers. SW>F1	7-9°C, 7/8 cloud cover. Damp wet day. Infrequent showers. SW slight breeze <F1	10°C. Slight mist throughout survey. Calm.	9°C. 8/8 cloud cover. Damp. Some periods of rain. Slight SW breeze (<F1).	10-11°C, 6/8 cloud cover. Light showers. Some sunshine. Calm
Site	GPS	45 minute Search	Site Visit 1	Site Visit 2	Site Visit 3	Site Visit 4
		lichen cover on trees.				
6	560627	676641	<b>No Kerry slug</b> - Placed 6 mats. Sitka spruce, not thinned/no defined canopy, pine needles and moss on floor bed. Moss cover on trees.	<b>No Kerry slug.</b>	<b>No Kerry slug.</b>	<b>No Kerry slug.</b>
7	561874	676262	<b>No Kerry slug</b> - Placed 6 mats. Mature sitka spruce. 20m high, Moss and pine needles on floor. Canopy, Thinning and getting ready for felling Significant moss cover on trees, little/no lichen cover on trees stumps	<b>No Kerry slug.</b> Great Grey Slug/leopard slug Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug.</b> Great Grey Slug/leopard slug	<b>No Kerry slug.</b> Great Grey Slug/leopard slug
8	562027	677421	<b>No Kerry slug</b> - Placed 6 mats. Mature sitka spruce, little to no moss on floor bed & tree stumps. Ponds and frogs/spawning.	<b>No Kerry slug.</b> Arthropoda, centipede Common Woodlouse ( <i>Oniscus</i> sp.)	<b>No Kerry slug</b> Great Black Slug ( <i>Arion ater</i> ) Common earth Worm ( <i>Lumbricus terrestris</i> )	<b>No Kerry slug.</b> Common Woodlouse ( <i>Oniscus</i> sp.)
9	562405	677758	<b>No Kerry slug</b> - Placed 6 mats. Bogland/Heath. Metric traps paced on vegetation/boulder.	<b>No Kerry slug.</b> Great Black Slug ( <i>Arion ater</i> )	<b>No Kerry slug.</b>	<b>No Kerry slug.</b>

**3.1 PHOTOGRAPHIC PLATES**



Checking under carpet of epiphytic bryophytes at site 1 (14/02/2019)



Metric traps installed at site 1 (14/02/2019)



Leopard slug (*Limax maximus*) at Site 1 (21/02/19)

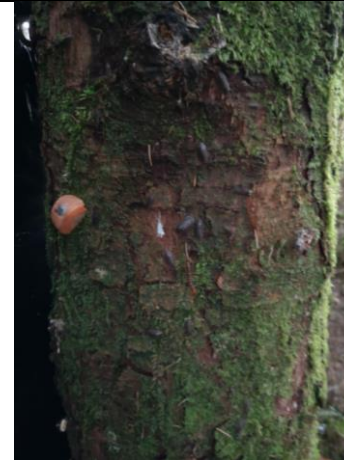


Leopard slug (*Limax maximus*) at Site 1 (21/02/19)





Checking mats at Site 2 (01/03/2019)



Common Woodlouse (*Oniscus* sp.) at Site 2 (01/03/2019)



Installing metric trap at Site 3 (14/02/2019)



Common Woodlouse (*Oniscus* sp.) during checking of mats at Site 4 (22/03/2019)





Metric traps installed at Site 6 (14/02/2019)



Metric traps installed at Site 7 (14/02/2019)



Checking refuge mats at Site 7 (08/03/2019)



Checking refuge mats at Site 8 (08/03/2019)



**Arthropoda; Centipede observed at Site 8 (08/03/2019)**



***Arion ater* found under metric trap placed on bogland at Site 9 (22/03/2019)**



#### **4 DISCUSSION**

The results of the Kerry slug survey suggest that this species was not present at the Carrownagowan Wind Farm site. The results are supported by the desk study carried out for the area. The Carrownagowan Wind Farm site is not within the known range or known distribution of Kerry slug.

#### **5 CONCLUSION**

The Carrownagowan Wind Farm site is dominated by commercial conifer plantation. A Kerry slug survey was completed at the site in February and March 2019. Surveys included hand searching and placing of metric traps at nine sites throughout the study area. Surveys were carried out under NPWS Licence No. C207/2018. While other slug species were found at the nine sites surveyed, Kerry slug was not recorded.

## 6 REFERENCES

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McDonnell, R.J. and Gormally, M.J., (2011b) A live trapping method for the protected European Slug, *Geomalacus maculosus* Allman, 1843 (Arionidae). *Journal of Conchology*, 40 (4): 483-485

National Parks and Wildlife Service (NPWS) (2013) The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland

Platts, E.A. & Speight, M.C.D. (1988) The taxonomy and distribution of the Kerry slug *Geomalacus maculosus* Allman, 1843 (*Mollusca: Arionidae*) with a discussion of its status as a threatened species.

Reich, I., O'Meara, K., Mc Donnell, R.J. and Gormally, M.J. (2012) An assessment of the use of conifer plantations by the Kerry slug (*Geomalacus maculosus*) with reference to the impact of forestry operations. Irish Wildlife Manuals, No. 64. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.



# **Appendix 1**

## **Correspondence with NPWS/Licence application**



Kerry Slug Survey License application - Message (HTML)

Message Foxit PDF

Reply Reply to All Forward File Search Review Comment Delete Move to Folder Create Rule Other Actions Block Sender Not Junk Safe Lists Junk E-mail Categorize Follow Up Mark as Unread Find Related Select Find

From: Caoimhin O'Neill  
 To: 'wildlifelicence@ahg.gov.ie'; 'wildlifelicence@dhg.gov.ie'  
 Cc:  
 Subject: Kerry Slug Survey License application

Sent: Tue 18/09/2018 14:29

Message 19107 Letter-NPWS Kerry Slug Licence.pdf 19107 Section 23 - Capture or Kill Protected Wild Animals -.pdf Study Area-Aerial.pdf Study Area-Discovery.pdf

Dear Sir/Madam,

Currently, we are carrying out ecological surveys in the townlands of Caherhurlly, Carrownagowan, Coumnagun, Kilbane, Killokeneddy, Ballydonaghan, and Inchalughoge, approximately 6.5km to the northwest of Killaloe, Co Clare. Central Point ITM Coordinates: 561853, 677248.

I am requesting a licence to conduct a Kerry slug (*Geomalacus maculosus*) survey, at the study area for the species.

Attached, please find the following;

- Cover letter with descriptions of proposal
- Section 23 & 24 application form (Capture or Kill Protected Wild Animals)
- Aerial mapping
- Discovery mapping


If you have any questions regarding the above, please contact me.

Regards,


Caoimhin O' Neill,  
 for Malachy Walsh and Partners

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**Malachy Walsh and Partners**  
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 W: [www.mwp.ie](http://www.mwp.ie)



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# **Appendix 2**

## **Licence No. C207/2018 (NPWS)**





An Roinn Cultúir,  
Oidhreacht agus Gaeltachta  
Department of Culture,  
Heritage and the Gaeltacht

Licence No. C207/2018

**NATIONAL PARKS & WILDLIFE SERVICE**

**Wildlife Acts 1976 to 2018 – Sections 23 and 34**

**LICENCE TO CAPTURE PROTECTED WILD ANIMALS FOR EDUCATIONAL, SCIENTIFIC  
OR OTHER PURPOSES**

The Minister for Culture, Heritage and the Gaeltacht in exercise of the powers conferred on her by Sections 9, 23 and 34 of the Wildlife Acts 1976 to 2018 authorises:

**Caoimhin O'Neill, Muiread Kelly, Hazel Dalton, Pat Ryan and Ger Hayes  
Malachy Walsh and Partners,  
Reen Point, Blennerville, Tralee, Co. Kerry**

To disturb specimens of the species specified in Column 1 of the Schedule hereunder in the area specified in Column 2 by the means specified in column 3 for scientific educational or other purposes during the period beginning **01 February 2019** and ending on **31 March 2019**, subject to the conditions listed overleaf.

**SCHEDULE**

1	2	3
Species	Area	Means of capture
<i>Kerry Slug (Geomalacus maculosus)</i>	Townlands of Caherhurly, Carrownagowan, Coumnagun, Kilbane, Killokennedy, Ballydonaghan and Inchalughoge approx. 6.5km northwest of Killaloe, Co. Clare	Visual Observations during transects/hand search, Metric Traps (refuge traps)

Dated 18 December 2018

For the Minister for Culture, Heritage and the Gaeltacht

