

Aquatic Macroinvertebrate Sampling Report

Lyrenacarriga Wind Farm





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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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1. INTRODUCTION

MKO were appointed to conduct ecological surveys of the rivers and streams that are located on the proposed Lyrenacarriga Wind Farm site. The survey work was conducted by Julie O' Sullivan (BSc., MSc.).

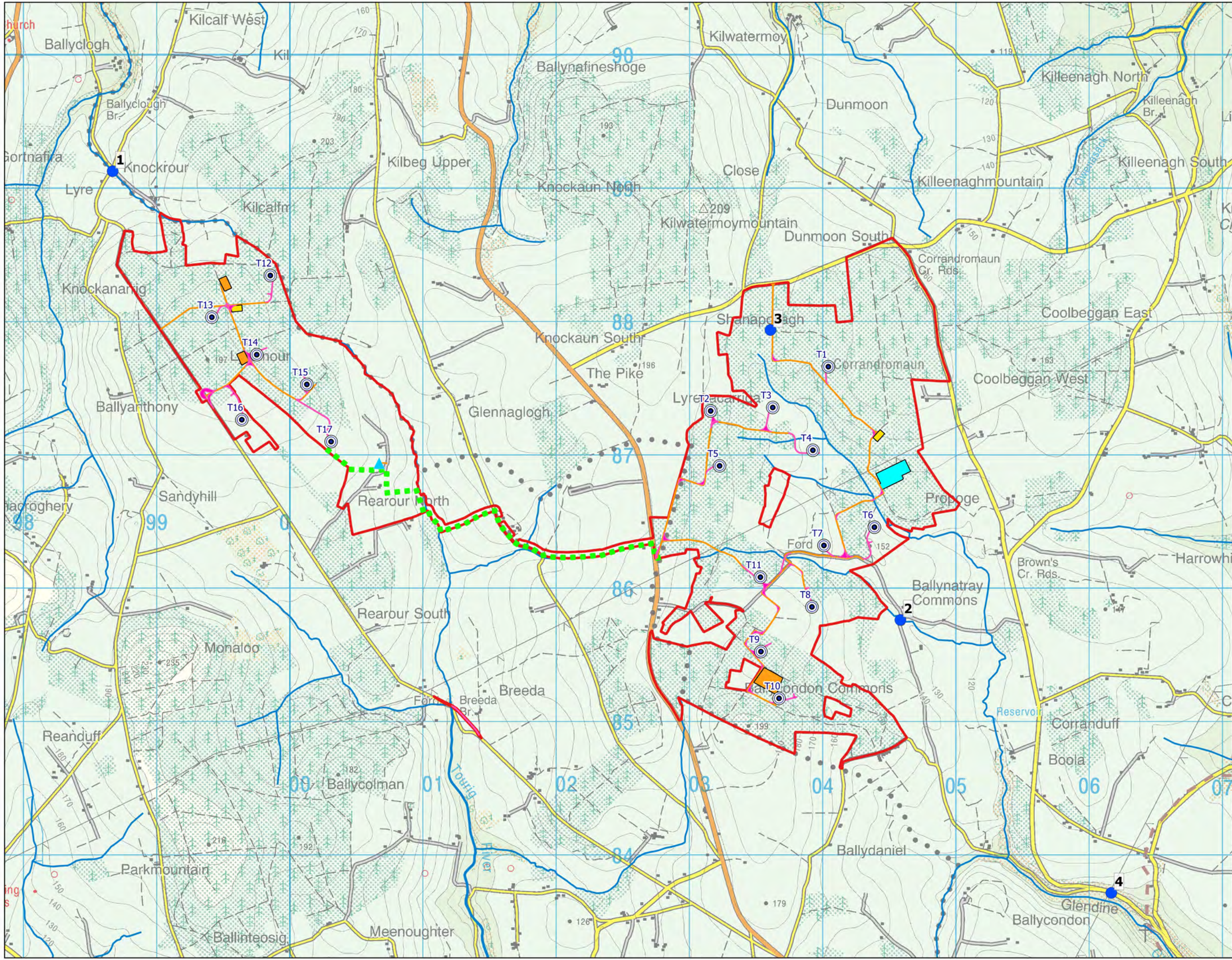
Sampling was carried out in the EIAR study area at 4 sites on the 26th of September 2019. Watercourses were assessed if they were located within or downstream of the Proposed Development or the grid connection route and contained flowing water. The locations of each watercourse surveyed are provided in Figure 1.1.

Biological water quality was assessed through kick-sampling each of these watercourses. Macro-invertebrate samples were converted to Q-ratings as per Toner et al. (2005)¹. The applied Q ratings followed the EPA water quality classes and Water Framework Directive status categories. All riverine samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a two-minute sample, as per ISO standards for water quality sampling (ISO 10870:2012). Large cobble was also washed at each site where present. The results of the surveys at 4 sites are provided below.

1.1 Statement of Authority

Field surveys were undertaken by Julie O' Sullivan (B.Sc., M.Sc.) of MKO on 26th of September 2019. Julie has over 5 years' experience working in environmental consultancy. This report has been reviewed by David McNicholas (B.Sc., M.Sc., MCIEEM). David is a highly experienced ecologist has over 10 years' professional experience in environmental management and ecological assessment.

¹ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). *Water quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland.*



Map Legend

- Site Boundary
- Proposed 110kV Substation
- Proposed Turbine
- ▲ Proposed Met Mast
- Proposed Borrow Pit
- Collector Cabling Route
- Proposed Compound
- Proposed New Road
- Existing Road Proposed for Upgrade
- Kick Sample Locations
- EPA Mapped Watercourses

Kick Sample Locations

Project Title
Lyrenacarriga Wind Farm

Drawn By H Witter	Checked By D McNicholas
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Scale 1:25000	Date 2020.11.06

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

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2. RESULTS

The following sections outline the findings of the surveys.

2.1 Sample Station 1

Sample Station 1 is located to the west of the site at the Knockour Crossroads (grid ref.: W 98673 89174). Flow was of a moderate velocity and was slightly turbid. The main land use upstream of the sample site is pasture and forestry. Trees species recorded included Ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*) and elder (*Sambucus nigra*). Bankside vegetation included Ivy (*Hedera helix*), Bracken (*Pteridium aquilinum*), nettles (*Urtica dioica*), Himalayan Balsam (*Impatiens glandulifera*), Herb Robert (*Geranium robertianum*), hogweed (*Heracleum sphondylium*), and elder (*Sambucus nigra*). The substrate comprised cobble, gravel and fine gravel. Emergent macrophytes recorded included creeping buttercup (*Ranunculus repens*).

The Q rating assigned to the channel was Q3. It was assigned this value as Group A invertebrates were absent, Group B invertebrates were scarce, Group C invertebrates were excessive, Group D was absent and Group E had scarce representatives.

Table 2-1 Invertebrate Sample Station 1 Results (Knockour Crossroads)

Indicator Group	Taxon	Number
Group A - Very Pollution Sensitive	None	None
Group B - Moderately Pollution Sensitive	Plecoptera (<i>Leuctra</i>)	1
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	13
	<i>Baetis rhodani</i>	1
Group D - Very Pollution Tolerant	None	None
Group E - Most Pollution Tolerant	<i>Chironomus spp.</i>	2
	Tubificaidae/Naididae	4



Plate 2-1 Sample Station 1 at Knockrour Crossroads (grid ref: W 98673 89174) – Q3

2.2 Sample Station 2

Sample Station 2 is located within the eastern parcel, just west of Ballynatray Commons (grid ref: X 04596 85793). Tree species recorded included willows (*Salix spp.*), ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monogyna*) along with ivy (*Hedera helix*). Bankside vegetation included Bramble (*Rubus fruticosus agg.*), Ivy (*Hedera helix*), nettles (*Urtica dioica*), willows (*Salix spp.*) and ash (*Fraxinus excelsior*). The river was fast flowing and slightly turbid. The substrate comprised cobble, gravel, fine gravel and silt. Instream macrophytes included fool’s watercress (*Apium nodiflorum*) and emergent macrophytes included nettles (*Urtica dioica*). Upstream land use consisted of pasture.

The Q rating assigned to the channel was Q3-4, as group A was present in small numbers, Group B was common, group C was numerous, Group D was absent and group E was scarce.

Table 2-2 Invertebrate Sample Station 2 Results

Indicator Group	Taxon	Number
Group A - Very Pollution Sensitive	Heptageniidae	1
Group B - Moderately Pollution Sensitive	Baetidae	13
	Hydropsyche	1
Group C - Moderately Pollution Tolerant	<i>Gammarus</i>	5
	<i>Lymnaea</i>	1

Indicator Group	Taxon	Number
Group D - Very Pollution Tolerant	None	None
Group E - Most Pollution Tolerant	<i>Chironomus spp.</i>	3



Plate 2-2 Sample Station 2 (grid ref: X 04596 85793) – Q3-4

2.3

Sample Station 3

Sample Station 3 is located in the eastern parcel to the north (grid ref: X 03628 87911). Tree species recorded included Sitka Spruce (*Picea sitchensis*) and willows (*Salix spp.*). Bankside vegetation included Bramble (*Rubus fruticosus agg.*), gorse (*Ulex europaeus*), willows (*Salix spp.*), ferns and Bracken (*Pteridium aquilinum*). The river was fast flowing and slightly turbid. The substrate comprised bedrock, fine gravel and silt. No instream vegetation was recorded but emergent vegetation included hair moss (*Polytrichum spp.*) and liverworts. Upstream land use consisted of conifer plantation.

The Q rating assigned to the channel was Q3. It was assigned this value as Group A and B invertebrates were absent, Group C invertebrates were common, Group D was absent and Group E had one representative.

Table 2-3 Invertebrate Sample Station 3 Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	None	None
Group B - Moderately Pollution Sensitive	None	None

Indicator Group	Taxon	Dominance
Group C - Moderately Pollution Tolerant	Gastropoda (<i>Bithynia</i>)	1
	<i>Gammarus</i>	6
	<i>Chironomidae</i> (ex. <i>Chironomus</i>)	5
Group D - Very Pollution Tolerant	None	None
Group E - Most Pollution Tolerant	<i>Tubificaidae</i>	1



Plate 2-3 Sample Station 3 (grid ref: X 03628 87911) - Q3

2.4 Sample Station 4

Sample Station 4 is located downstream of the proposed wind farm site to the southeast (grid ref: X 06111 83757). Trees species recorded included Ash (*Fraxinus excelsior*) and Beech (*Fagus sylvatica*). Bankside vegetation included Bramble (*Rubus fruticosus* agg.), willows (*Salix* spp.), nettles (*Urtica dioica*), blackthorn (*Prunus spinosa*), and hawthorn (*Crataegus monogyna*). The river was fast flowing with no turbidity. The substrate comprised boulder, cobble and gravel. Instream vegetation recorded included mosses. Upstream land use consisted of pasture and woodland.

The Q rating assigned to the channel was Q3. It was assigned this value as Group A invertebrates were absent, Group B was scarce, Group C invertebrates were numerous, and Groups D and E were absent.

Table 2-4 Invertebrate Sample Station 4 Results

Indicator Group	Taxon	Dominance
Group A - Very Pollution Sensitive	None	None
Group B - Moderately Pollution Sensitive	Plecoptera (<i>Leuctra</i>)	1
Group C - Moderately Pollution Tolerant	Trichoptera (Uncased)	1
	<i>Gammarus</i>	4
	<i>Baetis</i>	6
Group D - Very Pollution Tolerant	None	None
Group E - Most Pollution Tolerant	None	None



Plate 2-4 Sample Station 4 (grid ref: X 06111 83757) - Q3

3.

CONCLUSION

The survey included a general habitat assessment and biological water quality assessment at watercourses where flowing water was present within or downstream of the Proposed Development and grid connection route. Three of the four sample locations assessed were Q3 'Poor', and one as Q3-4 'Moderate'.