Rockford Manor School
Adorate Dominum In Atrio Sancto Eius - AD 1777

How Healthy is our Local River?

TY Students, Rockford Manor Secondary School, Dublin, Ireland

5th March 2025

The GLOBE Program Ireland

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1. ABSTRACT

Transition year and leaving cert applied students at Rockford Manor have taken part in the Globe Ireland Citizen Science River Ecosystem Campaign and have carried out a study of their local river at Deansgrange, Co Dublin. Visual inspections of the river have been conducted and the water has been sampled to measure temperature, pH and nutrient phosphate and nitrate concentrations. Kick sampling has also been conducted. Results show that the river water quality may be in the "poor quality" category due to high nitrate levels, presence of pollutant-tolerant aquatic invertebrate species along with the absence of pollutant-sensitive species.

2. INTRODUCTION

2.1. Why are you investigating this topic?

Students at Rockford Manor have a great interest in the environment and in citizen science. We are passionate about working towards our sustainable development goals. EPA assessments have shown that about half of the surface water bodies in Ireland are not as ecologically healthy as they should be. We would like to investigate the health of our local river as it plays is an important role in our local environment.

2.2. **Our School**

Rockford Manor is a secondary school located in Blackrock, County Dublin, Ireland. Our school is a Green-School (Eco-School) and is located in an urban setting next to a busy road and roundabout.

Ireland

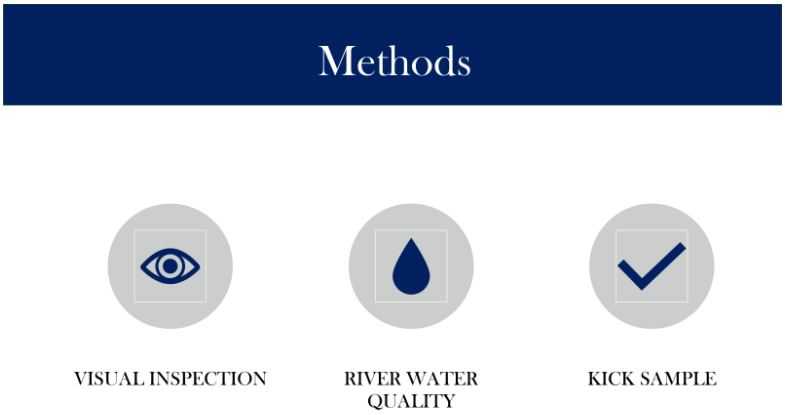
3. DEANSGRANGE RIVER – OUR LOCAL RIVER

Our school Rockford Manor is located in Blackrock, Co. Dublin. We studied our local river, the Deansgrange stream that is located a distance of 2km from the school. The Deansgrange catchment, the land that drains to the Deansgrange stream, is a relatively long and narrow area, stretching from Deansgrange in the northwest to Loughlinstown in the southeast. We based our studies on the section of this river that is located in Clonkeen Park behind the SuperValu Deansgrange supermarket. This urban park runs between Clonkeen Road and Pottery Road where there is a mix of residential properties, commercial and industrial facilities. In recent years works associated with the Deansgrange Flood Relief Scheme have been carried out and we noticed a deepening of the river bank and the installation of a wetland area to mitigate the risk of future flooding to nearby properties.


R827
R829
N11
Deansgrange
Sallynoggin
Kill Avenue
Kill Lane
Stillorgan Road
Bray Road
L3027
Foxrock
R118
Leopardstown Racecourse
Church Road
CARRICKMINES STREAM_010
Carrickmines
Ballybrack
KILL OF THE GRANGE STREAM_010
Loughlinstown
SHANGANAGH_010
Cherrywood
R842

4. METHODS

Students from Rockford Manor have visited this river site on four occasions over the past two academic year, October 2022, May 2023, October 2023 and March 2024. **Many thanks to the Globe Program and Globe Ireland** for the equipment and expert guidance and support they have provided us with this project. **Globe protocols** were used when sampling the river water and measuring the water's temperature and pH.



4.1. Equipment used

Student worksheet, gloves, bucket, rope, thermometer, pH strips & chart, nitrate & phosphate test tubes, sample net, freshwater invertebrate identification key and trays.

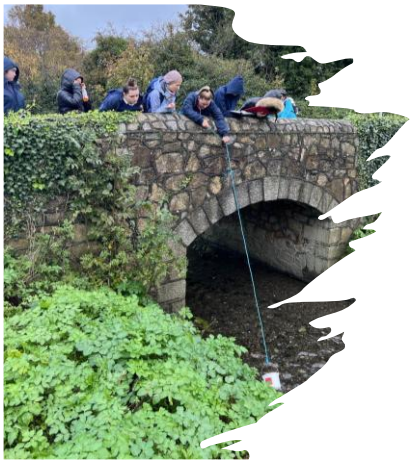
4.2. Visual Inspection

Students took time to walk quietly along the river to observe and record the following details in their **worksheets**.

- The **type** of waterbody, **width and depth**
- Visual **appearance** of the water and the **local habitat**
- **Flora and fauna** of the immediate area

4.3. River Water Quality: Snapshot of Chemical Properties

- A **bucket and rope** were used to collect water samples from the river. Sampling **protocols** were adhered to such as rinsing the bucket 3 times with river water and trying not to disturb the bottom of the steam.
- Water **temperatur**e and **pH** was measured and recorded 3 times and the average recorded.
- **Nitrate** and **phosphate** test kits were used along with comparator colour charts to determine nutrient concentrations



4.4. Kick Sample Testing

- Kick sample testing was carried out on the river bed to investigate the species of **freshwater invertebrates** present.
- Identification keys were used to name any creatures found.

5. RESULTS

5.1. Visual Inspection

The section of the river we studied is mostly straight with a **depth of 10-15cm** and a **width** of approximately **2.5m**. There are **trees, shrubs and grass** along the river bank with two **concrete bridges**.

When observed the water was **clear**; we could see the stoney riverbed. We also noticed several **riffles** at various points along this shallow river.

We **did not observe any fish** in the river, but we did notice aquatic **invertebrates**. There are many plants and trees along the river and we heard and observed many species of **birds**. We observed an **egret** and **ducks** along the river along with many **dogs** being walked through the park. Insects such as **butterflies, bees and midges** were also found at this location.

On all of our visits we noticed **rubbish** in and around the river; plastic and metal items along with coffee cups and a shopping trolley. On one occasion we noticed some effluent entering the river from a pipe. The water turned cloudy at this location.

5.2. River Water Quality

The average results of the chemical properties of the water are summarised in the table below. Our tests indicate high levels of nitrates and acceptable levels of phosphates in the water. A neutral pH was measured and the water temperature ranged from 10 to 14°C.

Table 1: Average River analysis results

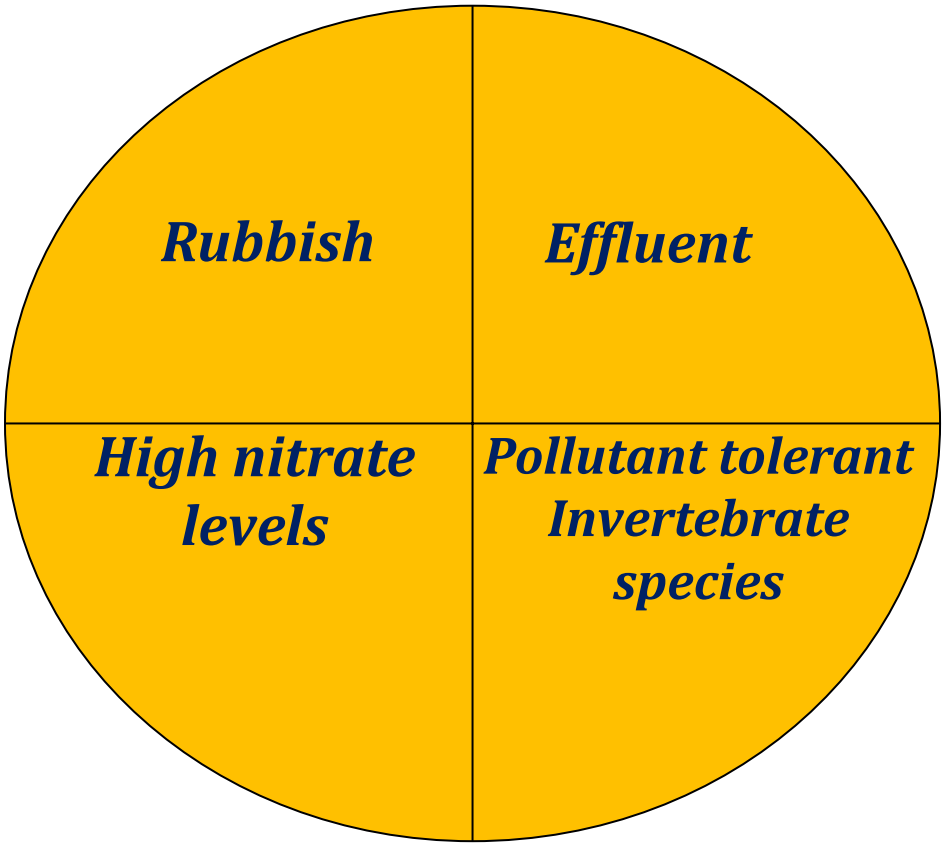
Nitrate Concentration ppm	Phosphate Concentration ppm	pH	Water Temperature °C
2-5	**0.05 - 1**	**7**	**12**

5.3. Kick Sample Testing

Samples from kick sample testing indicated a high amount of freshwater shrimp in the river, along with some water snails, leeches and water lice. These aquatic invertebrates are pollutant tolerant species.

6. DISCUSSION: KEY ISSUES TO BE ADDRESSED

- Our results indicate that our local river in Deansgrange **may not be as healthy as we would like it to be.**
- **Elevated nitrate levels** may be due to fertilizers entering the water upstream.
- The presence of **rubbish** in the water and the mystery **effluent** entering the water could also indicate poor river health.
- Another concerning finding of our studies is the **absence of pollution-sensitive invertebrates** such as green caddisfly, stonefly and flattened mayfly which are **indicators of good water** quality and **the presence of invertebrates such as leeches and snails which indicate poor water quality.**



We would like to study the river further and perhaps understand the reasons why the river may be polluted to address these issues. We plan to visit the river again this Spring to further our study. We plan to submit a report of our analyses to our local authority to highlight the issues we have discovered with the health of the river.

7.COMMUNICATION OF FINDINGS

We have communicated our findings on our school notice boards and on our social media. We also presented our project at the Globe Europe & Asia online student sharing webinar in February 2025.

#"Science isn't finished until it's communicated"

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in the program's history – **30 years of GLOBE!**

📅 Date: **February 4–5, 2025**
🌍 Location: **Online**
💻 Language: **English**

CONCLUSION

Our Deansgrange River Ecosystem campaign indicates that the health of our river may not be good and could be describes as having water quality in the moderate to poor categories. We recognise that our results provide a snapshot of conditions at the river and more sustained analysis would provide a more reliable result.

We would like to **thank The Globe Program and Globe Ireland** for their support, expertise and guidance with this citizen science project.

8. CITATIONS

www.deansgrangefrs.ie

www.googlemaps.com

www.epa.ie/our-services/monitoring--assessment/freshwater--marine/catchments.ie

9. GLOBE BADGES

We would like to apply for the following badges

I AM A STUDENT RESEARCHER

Students have conducted this research using Globe Protocols. They have assessed the area, identified flora and fauna, measured the pH, temperature and nutrient concentrations of the river. These data have been recorded, analysed and interpreted by our students to assess the health of our river.

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I MAKE AN IMPACT

EPA assessments have shown that about half of the surface water bodies in Ireland are not as ecologically healthy as they should be. We decided to investigate the health of our local river as it plays an important role in our environment. We were keen to learn about the river's health and how that impacts the flora and fauna of the area and our local community. We plan to submit a report based on our findings to the local authorities and to suggest measures such as the control of fertiliser use upstream to improve the health of our river.

10. APPENDIX

Table 2: River analysis results

Date	Nitrate concentration ppm	Phosphate concentration ppm	pH	Temperature °C
27th Oct '22	2-5	0.05 - 1	7	10
5th May '23	2-5	0.05	8	13
27th Oct '23	2-5	0.05 - 1	7	14
19th March '24	2-5	0.05 - 1	7	12.5