

Long Term Monitoring of the European Herring Gull (*Argentatus larus*) on the Wexford Coastline

Rationale:

The main objective of this study is to observe, and to some extent quantify the value of human influence on the herring gull (*Argentatus larus*) through its contemporary environments. County Wexford has an extensive history dating back thousands of years. Different forms of site management have been used over the generations and have shaped the landscape (particularly the coastline). Recent shift away from primary industry in the docks has left various marks on the land, notably, Ballast Bank; a man-made structure which has now been abandoned. (NBHS, 2020). Studying the role that this land feature plays in regard to the herring gull could provide information about their place in urban landscapes. Ardavan beach is the control site in this study, giving us a method of comparing data with a natural landscape (albeit with its own forms of land use).

Research Questions:

1. What is the population size of herring gulls at each site
2. What site features attract herring gulls

Justification:

Although herring gulls are a species of least concern on the IUCN Red List, recent knowledge has suggested an overall declining trend. (IUCN Red List, 2021). This study aims to investigate the relationship between herring gull population, and the various features of land use. This information (in conjunction with other data) may provide some insight into the decreasing population of the herring gull and the niche they inhabit in the Anthropocene. (Louise, 2020).

Previous results from related studies have found extensive links between human and gull behaviour (interactions generally being studied as “nuisance events”) – most notably in the mating season. (Beasley and Dickins, 2023).

Considerations / Control Factors:

- Season – in order to eliminate variation, data collection of both sites will occur during the same month
- Accessibility – exposure (both human and animal) will affect the data collected on the sites
- Area for data collection – land area for data must remain equal
- Land use – some environments are not suitable for nesting
- Presence of other birds species – territories may encroach on each other
- Varying extent of human influence (different impacts)

Site Description:

Both sites are situated roughly 3km from one another along the Wexford coastline and have had various human influences.

Site One (brownfield):

An abandoned, man-made structure (island) just over 100m offshore. Originally built to facilitate trade in the Wexford Port (stored sand used to balance weight removed from ships offloading). Multiple repairs were made in the early 1800s and there was subsequent threat of demolition in the 1840s. (NBHS, 2020). In the late 1800s, the site was used to store coal before the danger of silting ended in the port closing in 1963. Since 2009 the site has been legally protected by the Record of Protected Structures of County Wexford. Although various proposals have been put forward, no further work has been done to Ballast Bank. (Wexford County Archive, 2001). The site is inaccessible and would have to be viewed from boat.

Site two (greenfield):

A stony beach located at the mouth of a small river north of Wexford town. The site is popular for crab fishing and is also frequented by dog walkers. (Wexford Hub, 2018). Surrounding land mainly consists of agricultural fields (rural setting).



Protocol:

- Distance sampling
- Stratified sampling
- Indirect counts
- Group based counts
- Territory mapping
- Point counts
- Marking and tagging

(five references to support – indicate existing protocols)

Survey Design:

Passive Techniques:

1. Indirect Counts – There are many advantages of this technique, particularly for answering research question two (e.g. potential for studying nesting patterns). The main drawback is the lack of accuracy / reliability when obtaining quantitative data.

2. Group Based Counts – These may present some issues associated with identifying the specific bird the study is aimed at. Despite this, the technique is one of the easiest methods of data collection and could provide broad information pertinent to question three.
3. Territory Mapping – This technique would offer useful data for question three, showing the effect of land use (bias from different sites). It would however, only function in conjunction with other data collection methods. The reliability of this information would improve over time as more information is collected (requires multiple visits).
4. Point Counts – Another useful method for question one due to the easily observable nature of herring gulls (main limitation being identifying the particular type of gull).
5. Area Searches – Use of point counts makes area searches unnecessary.

Non-Passive Techniques:

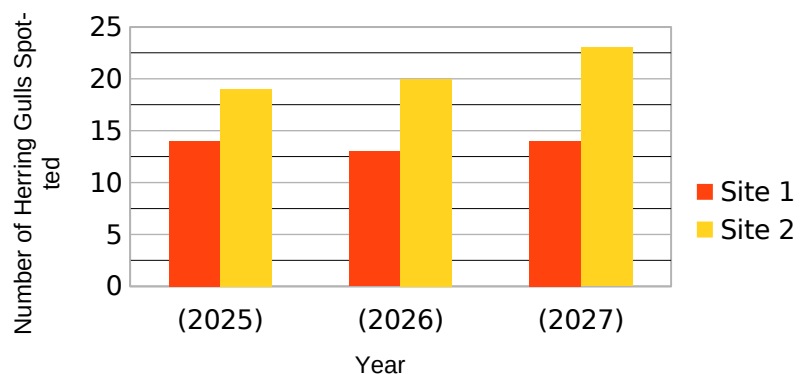
1. Playback – Not applicable for this study as the herring gull is easily observable.
2. Catching Birds – Catching birds for this study is largely unnecessary. This is mainly because morphological data doesn't directly pertain to the research questions but also because of the type of bird being studied.
3. Mist Netting – Not applicable due to the size of the bird.
4. Cannon Netting – Not applicable due to the size of the bird.
5. Nooses and Traps – Generally not practical for use on large populations of birds considering the work and skill required + risk of injury.
6. Morphological Data – Not applicable for the research questions in this study.
7. Marking and Tagging – This method, particularly mark and recapture, has many benefits for research questions one and two as it can be applied over time and gives a general outline for population size. Pit tags could have similar benefits. Both of these techniques however, require a method of capturing the birds which brings associated risks, costs and general impracticalities.

Survey Method:

1. Transects – Due to the size of location and the nature of the study, manoeuvring around the site wouldn't provide any significant benefit over stationary point counts.
2. Distance Sampling – applying this method in conjunction with point counts will provide more comprehensive data collection at no extra expense or effort (provides added background data for question one).
3. Aerial Surveys – These would be impractical to carry out in this survey due to site size.
4. Counting Migrants – Not applicable for the bird being studied.
5. Stratified / Random Sampling – Stratified sampling will be used in this case to gauge temporal change (research questions one and three).

Point Count Results Table and Graph:

Number of Birds Seen	Site 1 Ballast Bank	Site 2 Ardavan Beach
Date 1	14	19
Date 2	13	20
Date 3	14	23



Point Count (distance sampling) Data Sheet:

Site	Date 1	Date 2	Date 3	Date 4
1 (Ballast Bank)	1 – 20-30m 2 – 40-50m 3 – 20-30m ...	1 – 10-20m 2 – 10-20m 3 – 50-60m ...	1 – 20-30m 2 – 20-30m 3 – 20-30m ...	1 – 20-30m 2 – 40-50m 3 – 20-30m ...
2 (Ardcavan Beach)	1 – 30-40m 2 – 10-20m 3 – 20-30m ...	1 – 0-10m 2 – 60-70m 3 – 30-40m ...	1 – 20-30m 2 – 30-40m 3 – 30-40m ...	1 – 20-30m 2 – 40-50m 3 – 20-30m ...

Referencing:

Google Maps. (2019). Google Maps. [online] Google Maps. Available at: <https://www.google.co.uk/maps/@52.3425204>. [Accessed 5.11.24].

In text citation:
(Google Maps, 2019)

Wexford Hub. (2018). Ardcavan Beach, Wexford. [online] Available at: <https://wexfordhub.com/places/ardcavan-beach/>. [Accessed 5.11.24].

In text citation:
(Wexford Hub, 2018)

Wikipedia Contributors. (2023). Ballast Bank. [online] Wikipedia. Available at: https://en.wikipedia.org/wiki/Ballast_Bank. [Accessed 5.11.24].

In text citation:
(Wikipedia Contributors, 2023)

Sutherland, W.J., Newton, I., Green, R. (2004). *Bird ecology and conservation : a handbook of techniques*. Oxford ; Oxford University Press. Available at: [Bird ecology and conservation : a handbook of techniques - University of Wales Trinity Saint David](#). [Accessed 13.11.24].

General reading on ecology and conservation. In text citation:
(Sutherland, Newton and Green, 2004)

Booth Jones, K., Thaxter, C., Clewley, G., Wolsey, S., Calbrade, N., Atkinson, P., Calladine, J., Burton, N.H.K. (2022). [Belfast's urban gulls: an assessment of breeding populations, breeding season movements and winter population](#). British Trust for Ornithology (BTO). [Accessed 13.11.24].

Example of related study. In text citation:
(Booth Jones et al, 2022)

Clewley, G.D., Barber, L.J., Conway, G.J., Clark, N.A., Donato, B.J., Thaxter, C.B., Burton, N.H.K. (2021). [Foraging habitat selection by breeding Herring Gulls \(*Larus argentatus*\) from a declining coastal colony in the United Kingdom](#). Estuarine, Coastal and Shelf Science, 261, p.107564.

Example of related study. In text citation:
(Clewley et al, 2021)

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Red list info – links with rationale / justification. In text citation:
(IUCN Red List, 2021)

East Ayrshire Council. (2008). Seagull Population Report – East Ayrshire Council; gov.uk. Available at: [Seagull Population Report](#). [Accessed 13.11.24].

Applies to survey design. In text citation:
(East Ayrshire Council, 2008)

Natural England. (2022). *Biodiversity code of practice for planning and development*. CIEEM ; gov.uk. Available at: [Wild birds: advice for making planning decisions - GOV.UK](#). [Accessed 13.11.24].

Code of practice. In text citation:
(Natural England, 2022)

Beasley, E.R., Dickins, T.E. (2023). *Gull-human interactions in an urban population of Herring Gulls *Larus argentatus* and Lesser Black-backed Gulls *Larus fuscus**. Bird Study, 70(1-2), pp.55-58.

Herring gull behaviour in relation to human interaction. In text citation:
(Beasley and Dickins, 2023)

Monaghan, P. (1980). *Dominance and dispersal between feeding sites in the herring gull (*Larus argentatus*)*. Animal Behaviour, 28(2), pp.521-527.

Herring gull feeding behaviour. In text citation:
(Monaghan, 1980)

Kim, S.Y. and Monaghan, P. (2005). *Interacting effects of nest shelter and breeder quality on behaviour and breeding performance of herring gulls*. Animal Behaviour, 69(2), pp.301-306.

Herring gull mating behaviour. In text citation:
(Kim and Monaghan, 2005)

Louise, H.G. (2020). *Thinking with Gulls: Multi-species Interactions in the Anthropocene*. The Elphinstone Review, 80, pp.80-166.

Impacts of gulls on site management, justification of study. In text citation:
(Louise, 2020)

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Additional support material for rationale and protocol. In text citation:
(Fowler, Cohen and Jarvis, 2013)

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Additional support material for rationale, justification and protocol. In text citation:
(Raven and Coulson, 1997)

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Wexford County Records. (2001). Wexford Harbour Commissioners' Archive – Wexford Maritime Records. Available at: [Maritime records | Wexford County Archive](#). [Accessed 15.11.24].