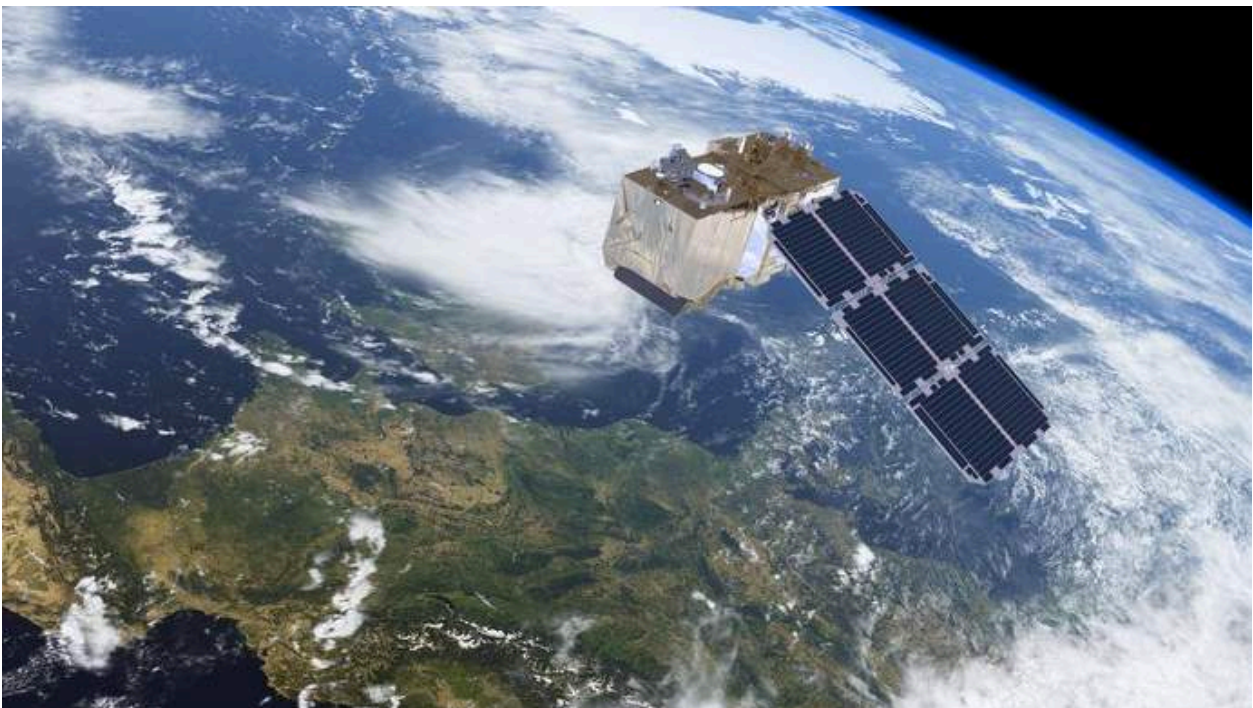


# Luton Airport

June 2017

## Site Monitoring Report



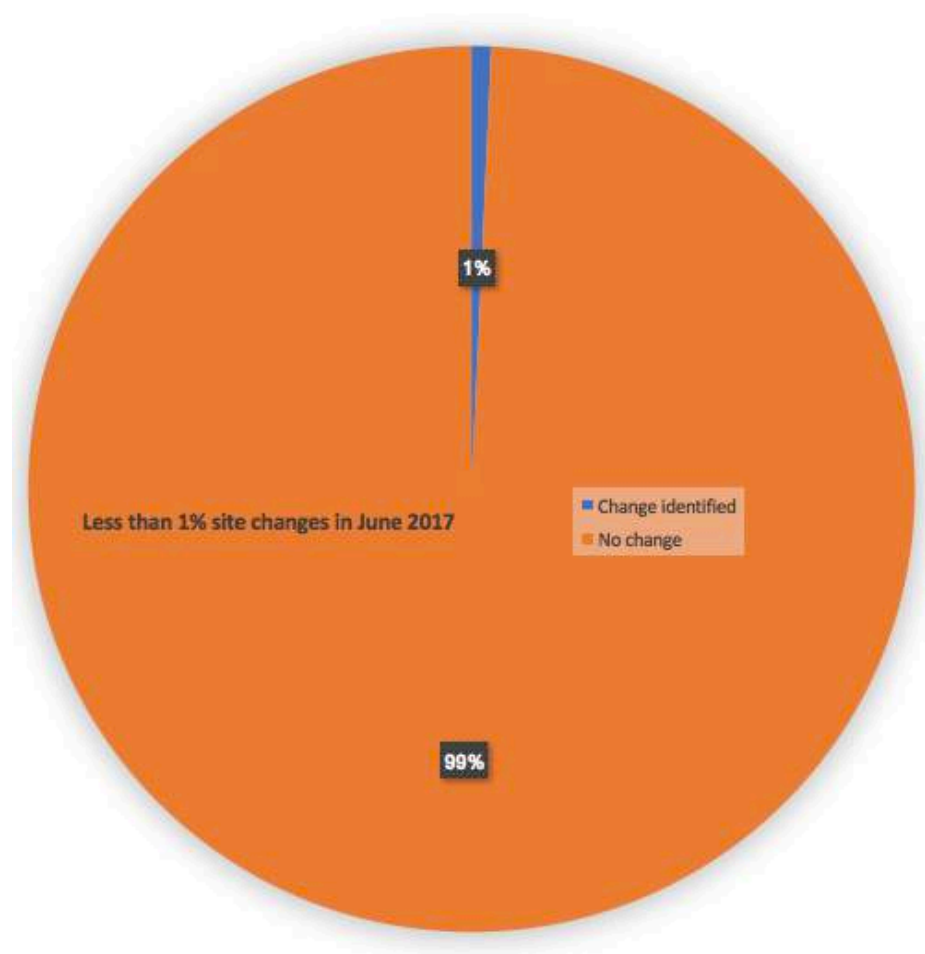
<b>Content</b>	<b>Page</b>
Introduction	2
Sites changed in June 2017	2
Sites monitored June 2017	6
Sites to be monitored the next 12 months	7
<b>APPENDIX 1</b>	
Surveillance method	8
Analytics of the 13k site registration species based site distribution	8
<i>Herring Gull</i>	9
<i>Cormorant</i>	10
<i>Great Black Backed Gull</i>	10
<i>Graylag Goose</i>	11
<i>Crow</i>	11
<i>Pheasant</i>	12
<i>Heron</i>	12
<i>Cormorant</i>	13
<i>Sand Martin</i>	13
<i>Wood Pigeon</i>	14
<i>Kestrel</i>	14
<i>Tufted Duck</i>	15
<i>Buzzard</i>	15
<i>Domestic Dove</i>	16
<i>Teal</i>	16
<i>Black-headed Gull</i>	17
<i>Mute Swan</i>	17
<i>Oystercatcher</i>	18
<i>Golden Plover</i>	18
<i>Common Gull</i>	19
<i>Shel duck</i>	19
<i>Sterling</i>	20
<i>Lapwing</i>	20
Site type description and distribution	21
<i>Golf course</i>	21
<i>Pasture</i>	21
<i>Water retention pond</i>	22
<i>Sewage works</i>	22
<i>Natural lake</i>	23
<i>Basin bog</i>	23
<i>Mineral extraction point</i>	24
<i>Meadow</i>	24
<i>Margel excavation pond</i>	24
<i>Playing fields</i>	24

## Introduction to satellite based monitoring

With the Ascend XYZ service Luton Airport is now able to monitor landscape changes that could impact wildlife behaviour in the 13 km zone. If a change is identified it will be included and assessed in the monthly monitoring report.

### Sites changed in June 2017: 2 out of 280

Changes are in this context defined as changes that can be identified in the sentinel 2 satellite maps. This means that the changes need to measure more than a minimum of 40x40 meters to be detected. General changes in agricultural fields, are not defined as a change in the report. A “site” is a general expression for habitats that attracts wildlife.



### Site change 1

Below a change in a pasture has been identified. In the satellite data you can see that there is a change to the site from November 20, 2016 to May 22, 2017.



**Site location:** In the map below you can see the site position.

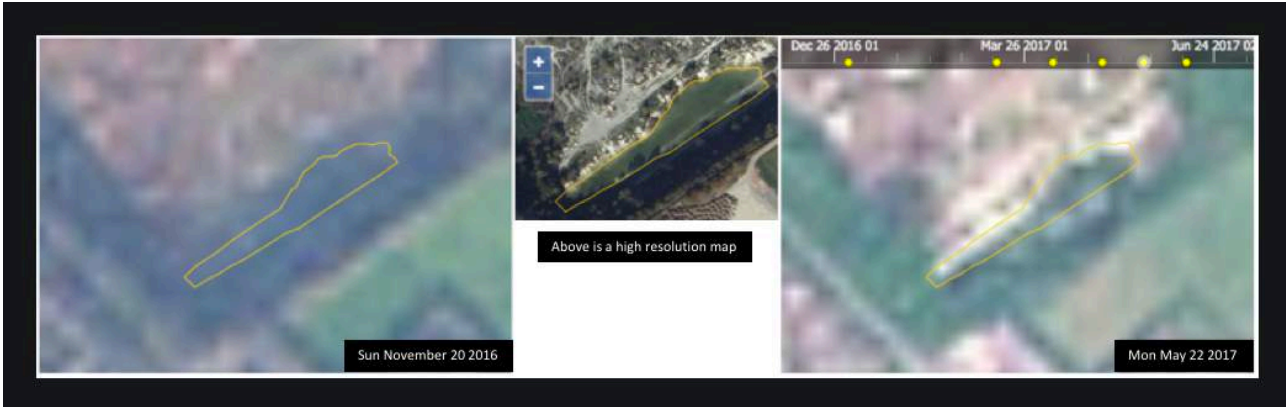


**Conclusion:** The site development is to be continuously monitored. The inspection cycle is 6 months. If the changes continue the need for an onsite inspection will be evaluated.

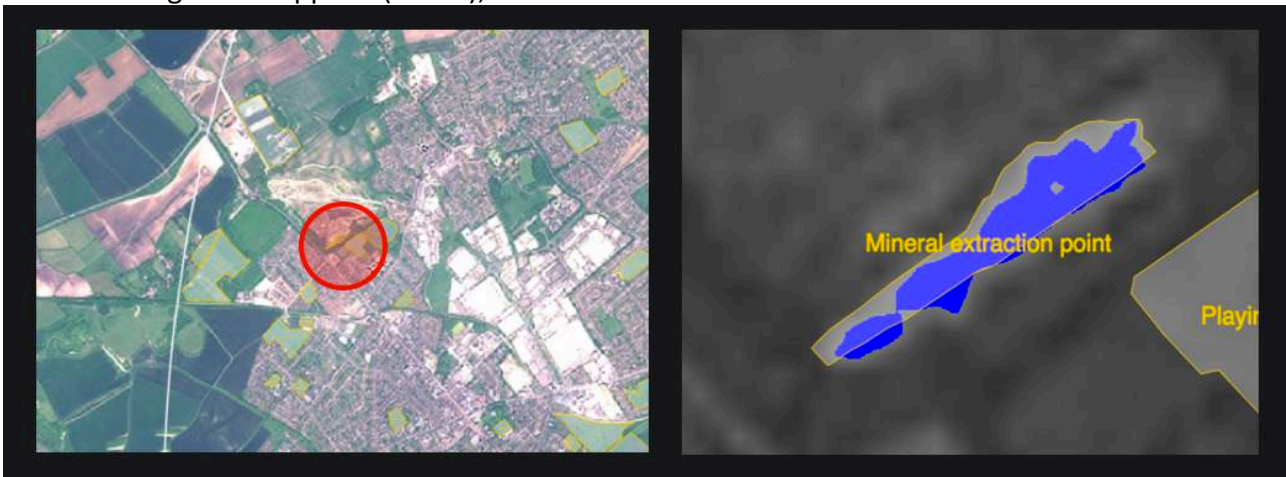
**Action:** Continually monitoring

**Site change 2**

**Observation:** A change in a Mineral extraction point has been identified. In the satellite data you can see that there is a change to the site from November 20. 2016 to May 22. 2017. It looks like the water surface is reduced.



**Site location:** In the map below you can see the site position to the left. On the right you see the find water algorithm applied (NDWI), this also indicates a reduction in the water surface.

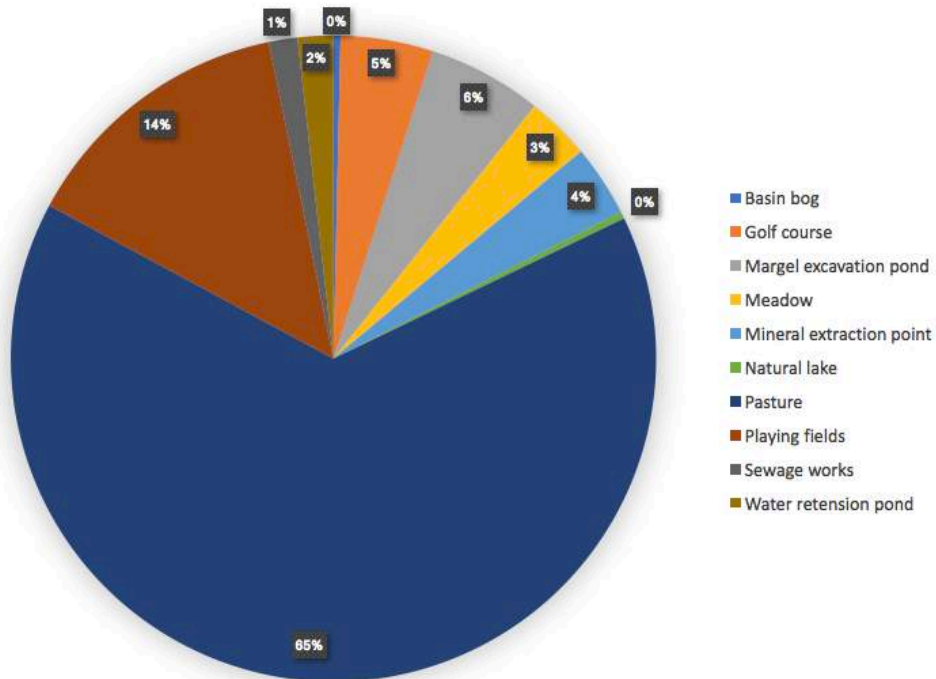


**Action:** Continually monitoring

## Sites monitored June 2017: 280

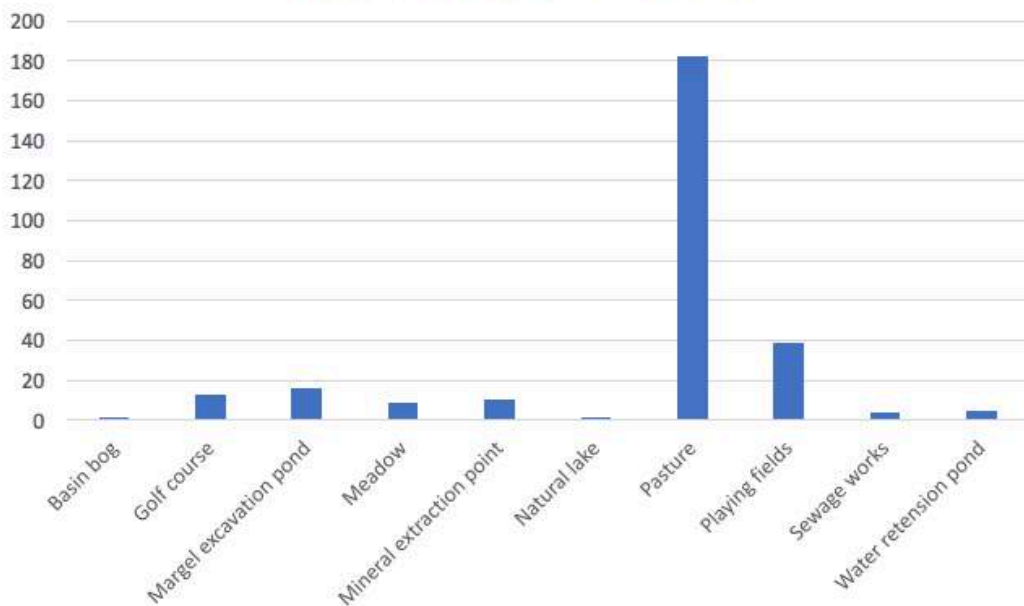
Below, you see a diagram visualising the distribution of types of sites monitored in June 2017.

Distribution in monitored sites June 2017



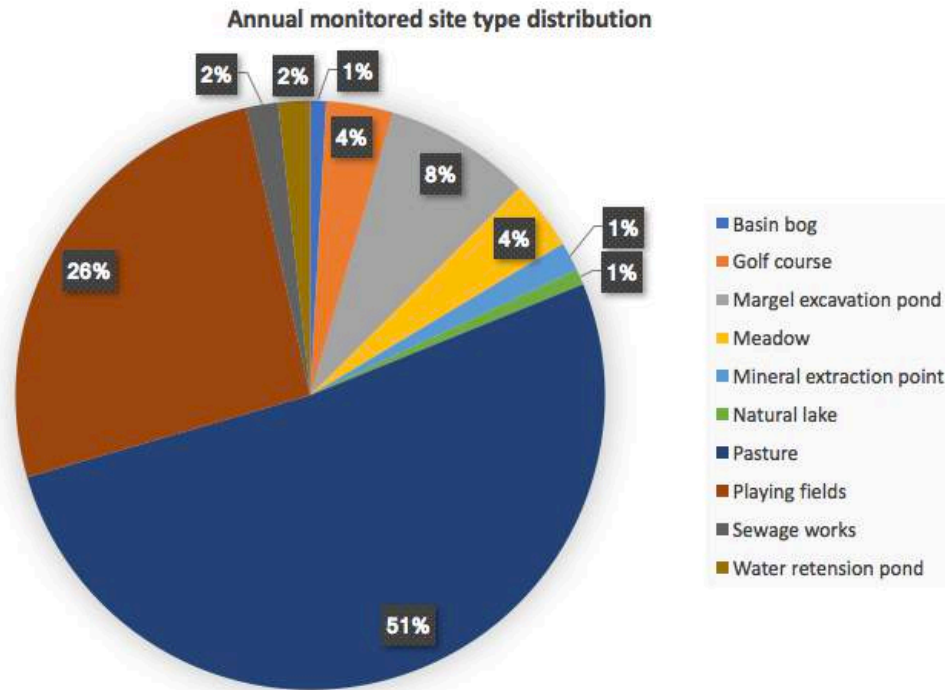
Below, you see a diagram visualising the number of sites, based on type, monitored in June 2017.

Monitored sites in numbers for June 2017

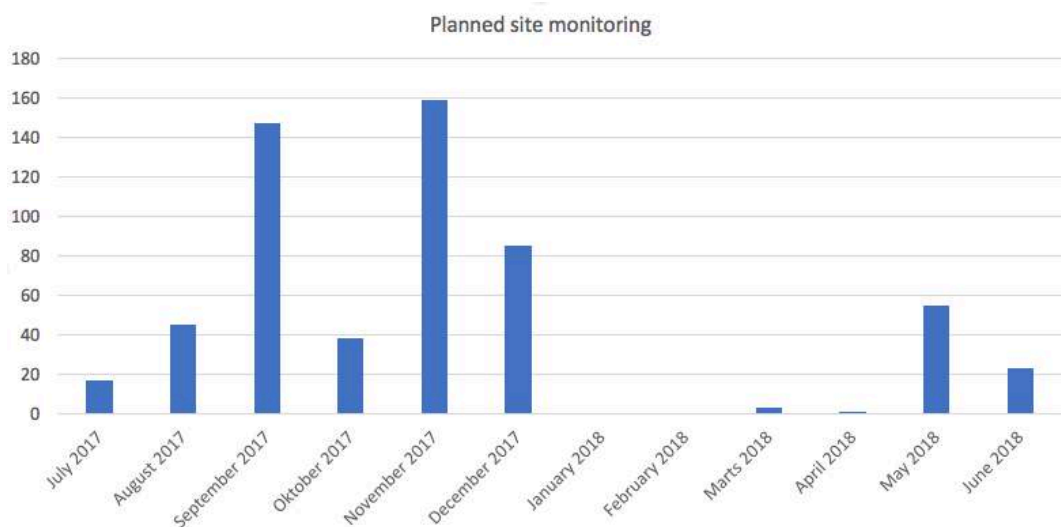


## Sites to be monitored the next 12 months: 577

Below, you see a diagram visualising the number of sites, based on type, that are planned to be monitored in the next 12 months



Below, you see a diagram visualising the number of sites, based on type, planned to be monitored in the next 12 months.



## APPENDIX 1

### Surveillance method

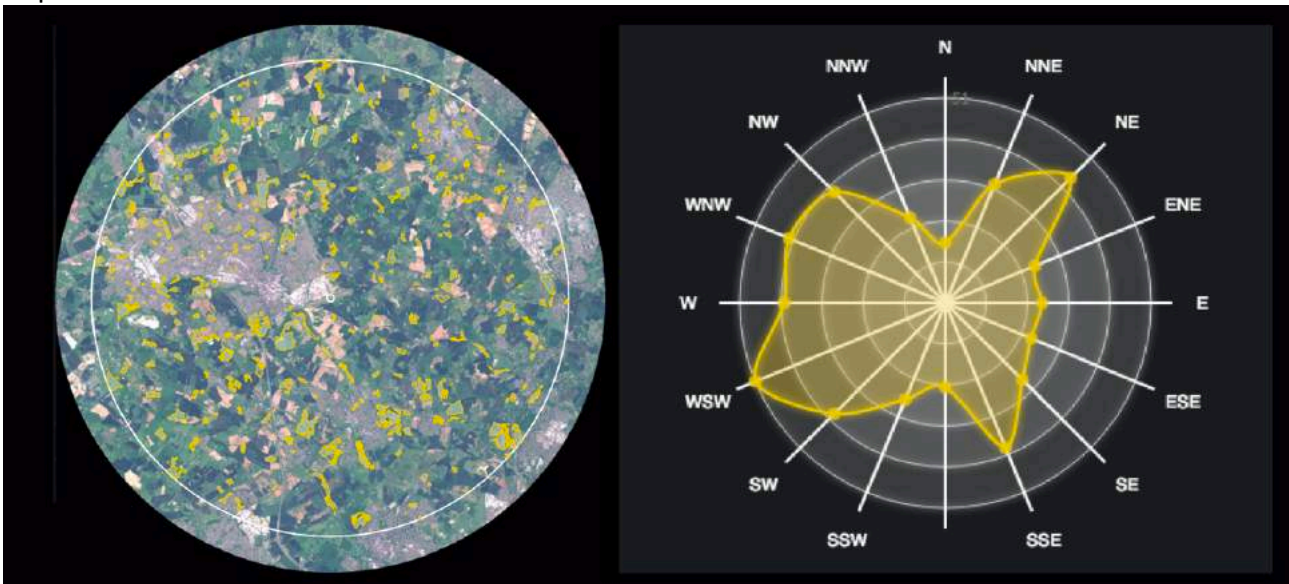
Based on the Ascend Wildlife Site Monitoring software, sites potentially attracting hazardous birds have been registered inside the safeguarding zone. The sites were drawn with polygons along their borders according to the habitat type in concern using a combination of the Bing Map, satellite maps and analysis of data from the sentinel satellites and GIS tools in the software. Every habitat type was described with their potential presence of bird species most hazardous to aviation.

Most of the sites in the safeguarding zone have no direct impact to the flight safety of the airport. However, the more sites there are and their cumulative area increase in the 13 km. safeguarding zone, the more birds will be present near the airport. Many bird species use these sites on a large-scale implying that they must fly over longer distance between the sites searching for feeding possibilities. Such feeding movements of birds may result that the birds will cross the flight corridors of aircraft or even intrude the airport area for feeding.

### Analytics of the 13k site registration

The Ascend Wildlife Site Monitoring software produces graphic presentations of the sites registered and drawn as polygons.

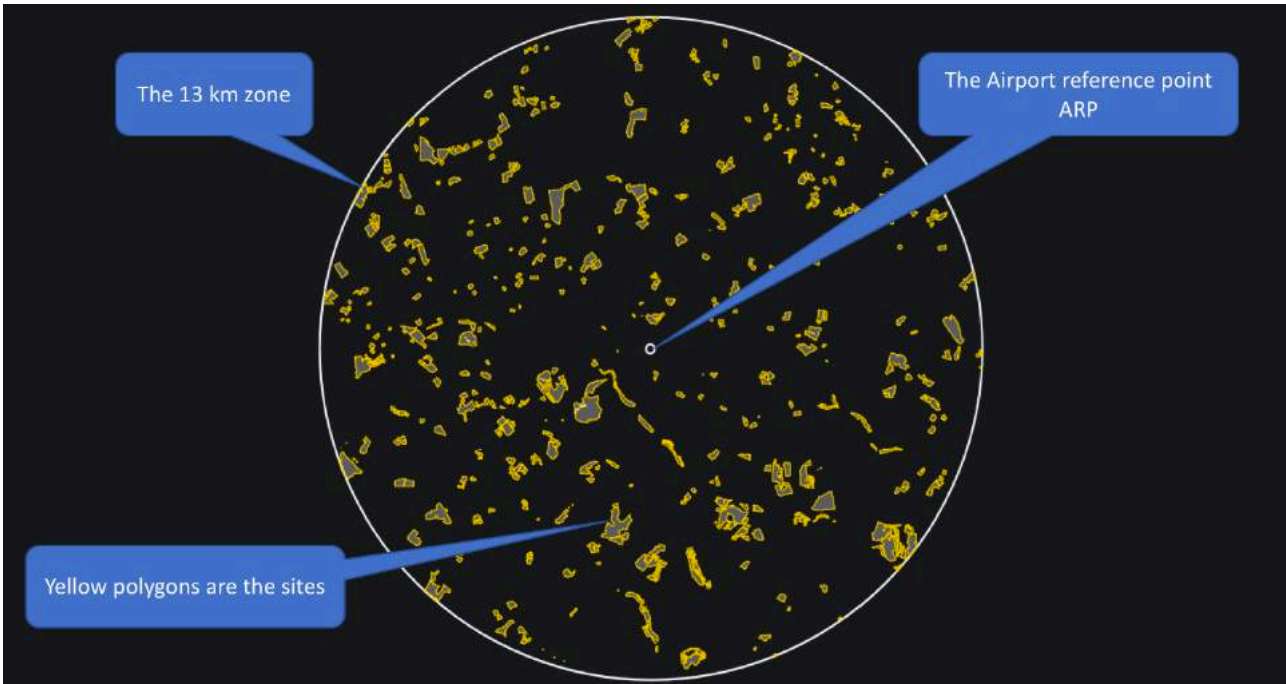
The 13 km safeguarding zone and all sites registered in the zone is visualized to the left in the image below. To the right, registered sites in relation to 16 compass directions is shown, centre is the APR. This gives an easy overview of the distributions of sites depending on direction from the airport.



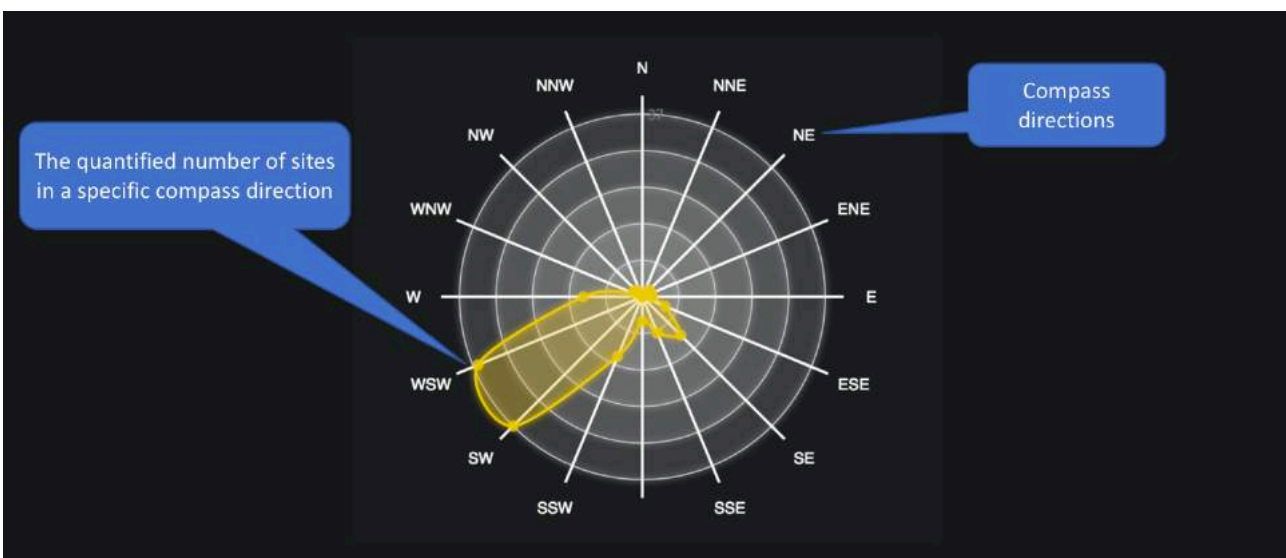


## Species based site distribution

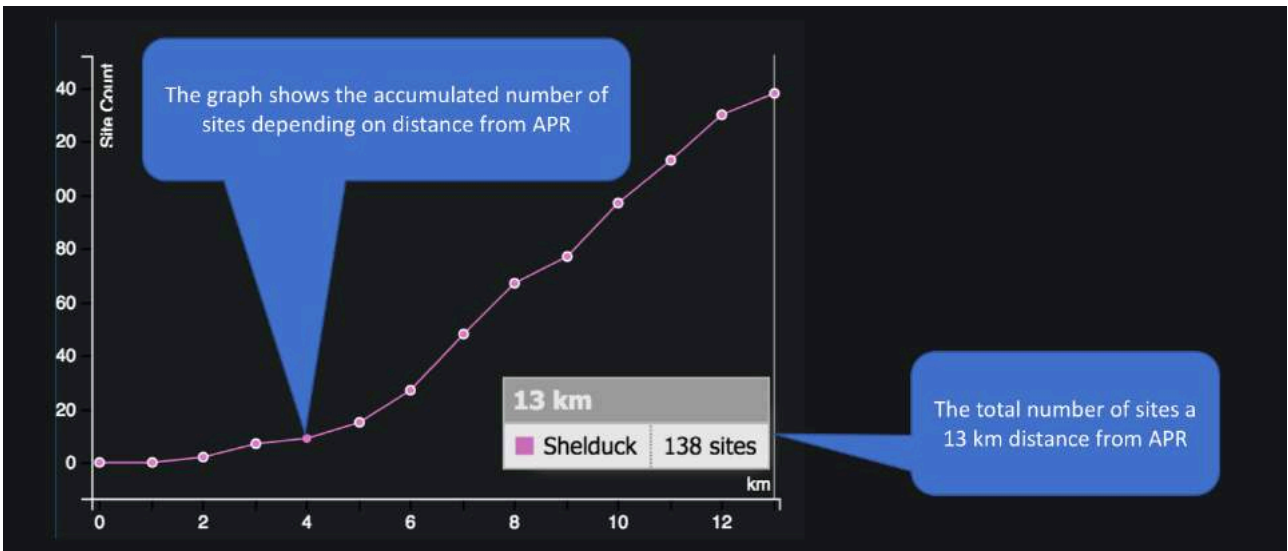
In this section the focus has been on sites that attract specific species. In the image below you can see the “13 km zone”, the ARP and the sites.



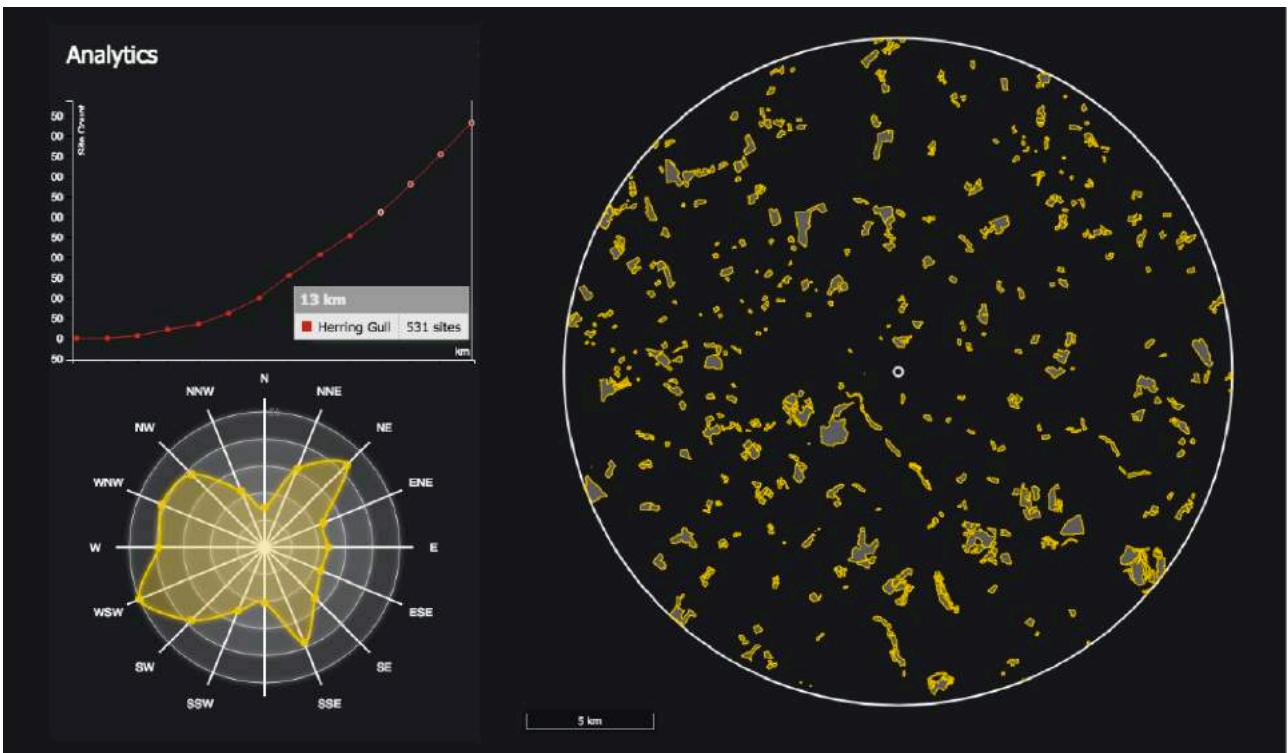
The site distribution depending on direction from the ARP is shown in the figure below with the 16 compass directions.



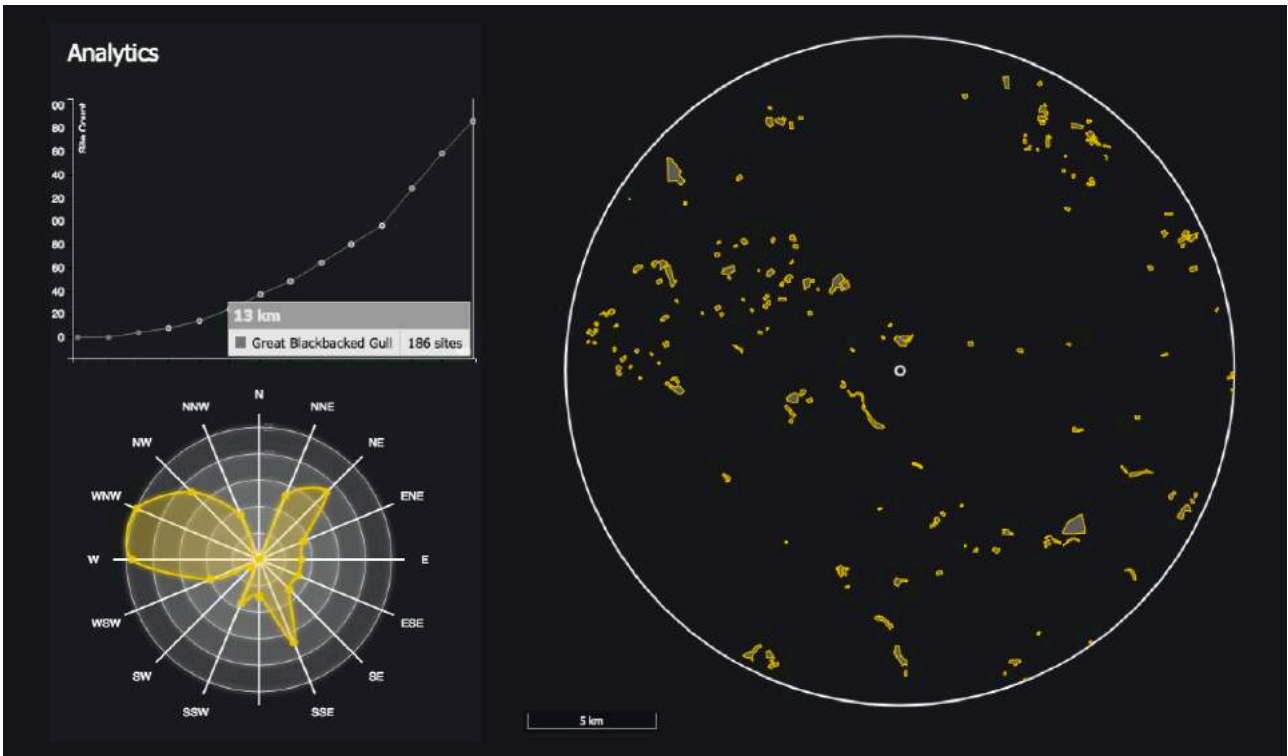
The Graph visualizes the number of sites depending on distance from the ARP as well as the total number of sites in the 13 km zone.



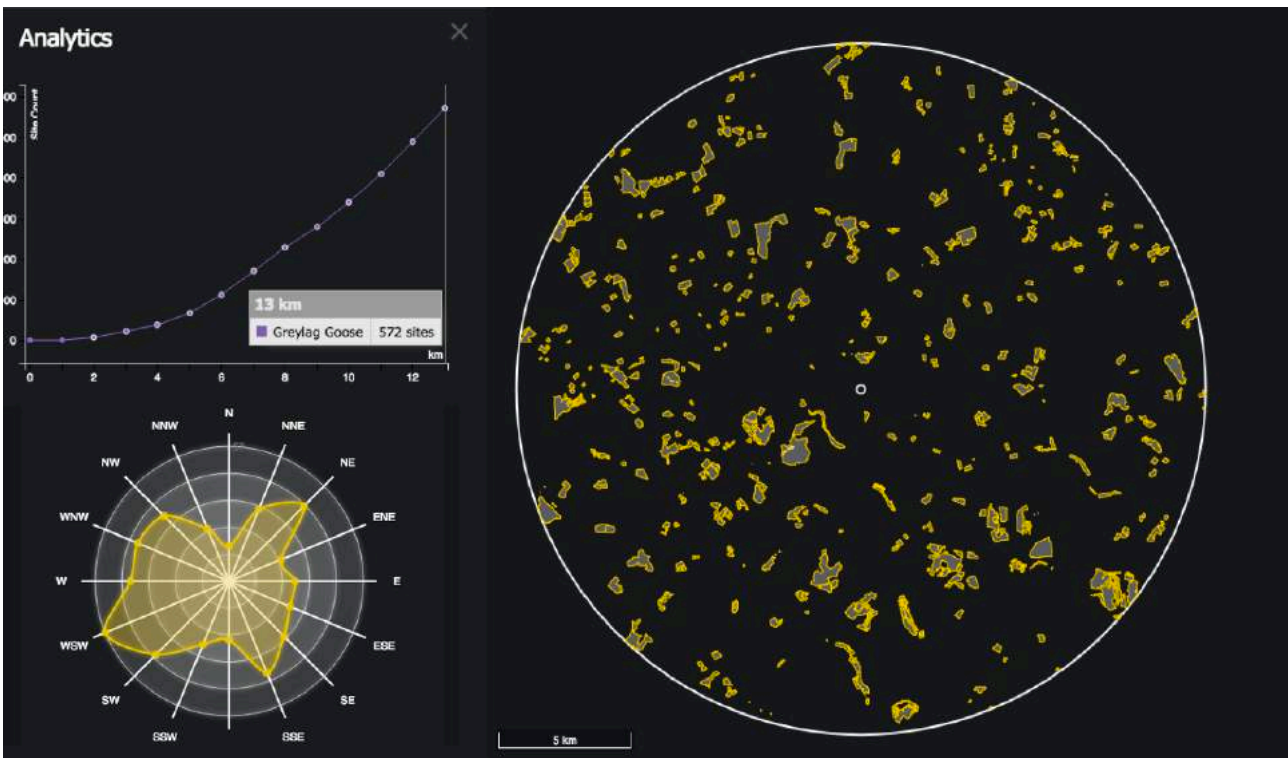
Herring Gull sites are described below:



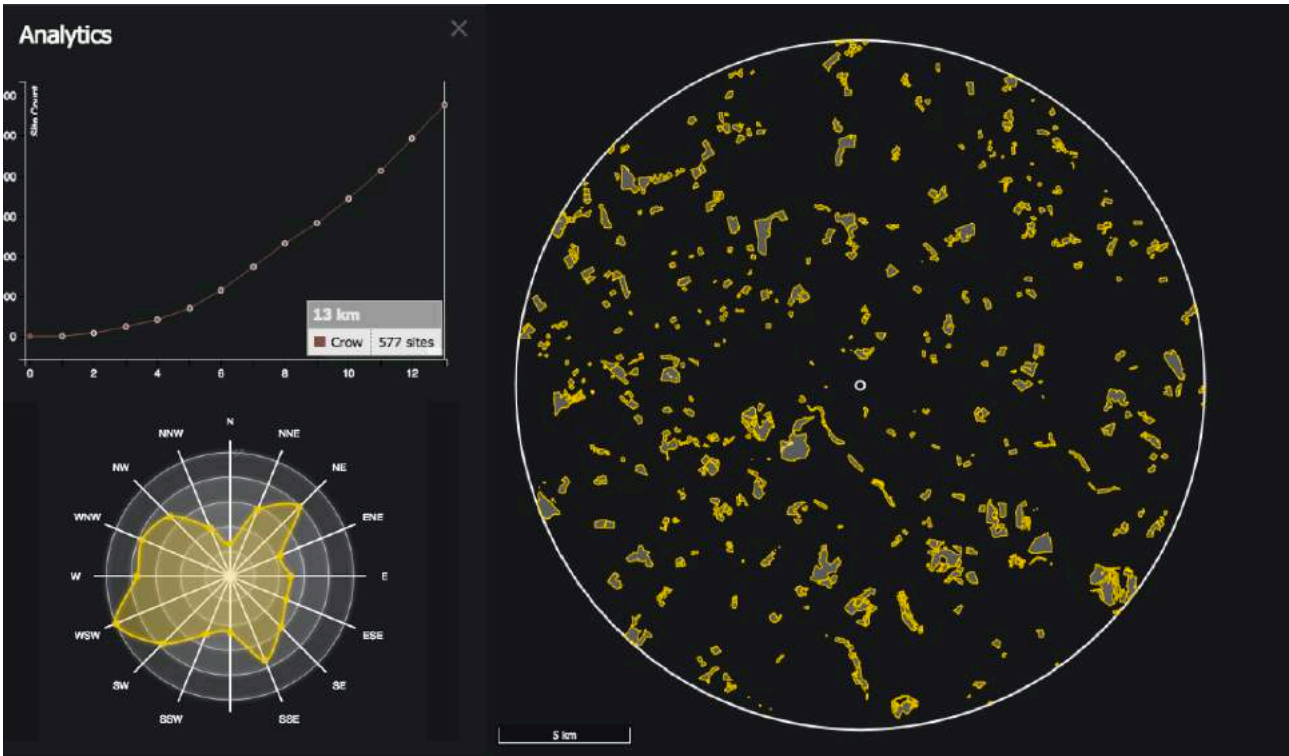
Great Black Backed Gull sites are described below:



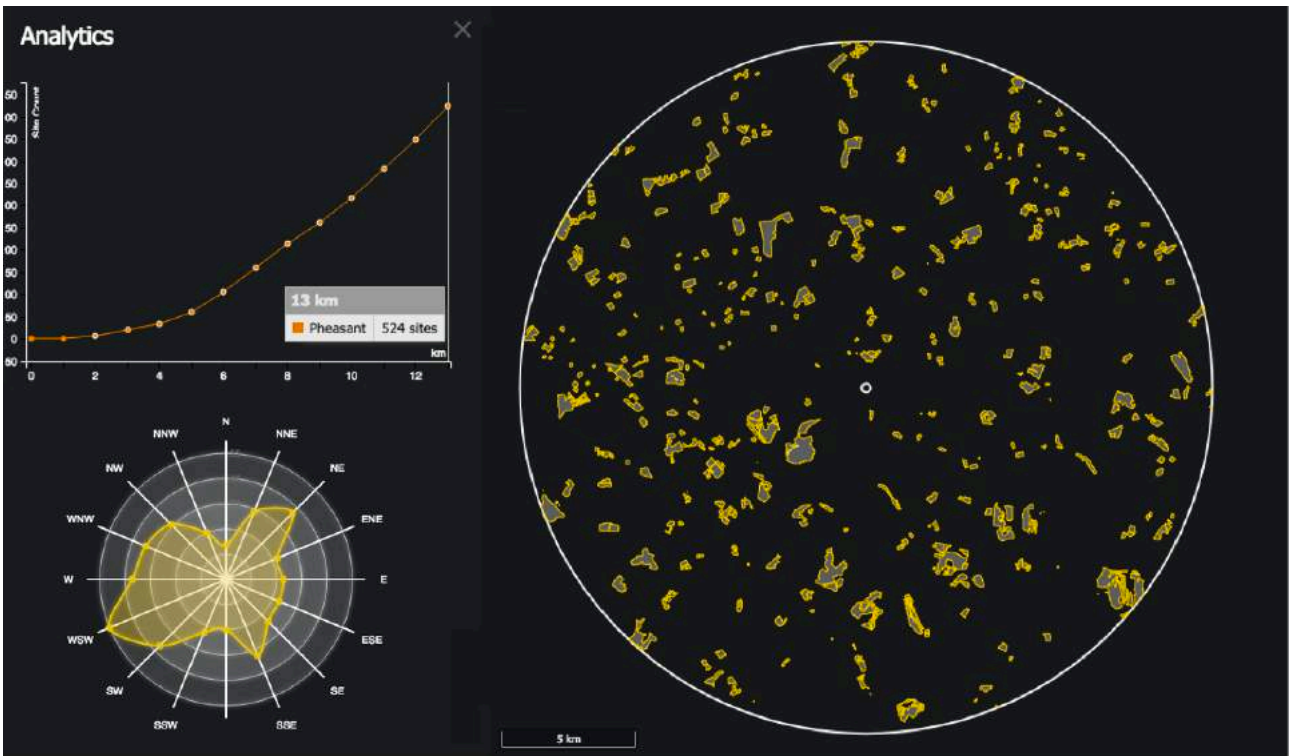
Greylag Goose sites are described below:



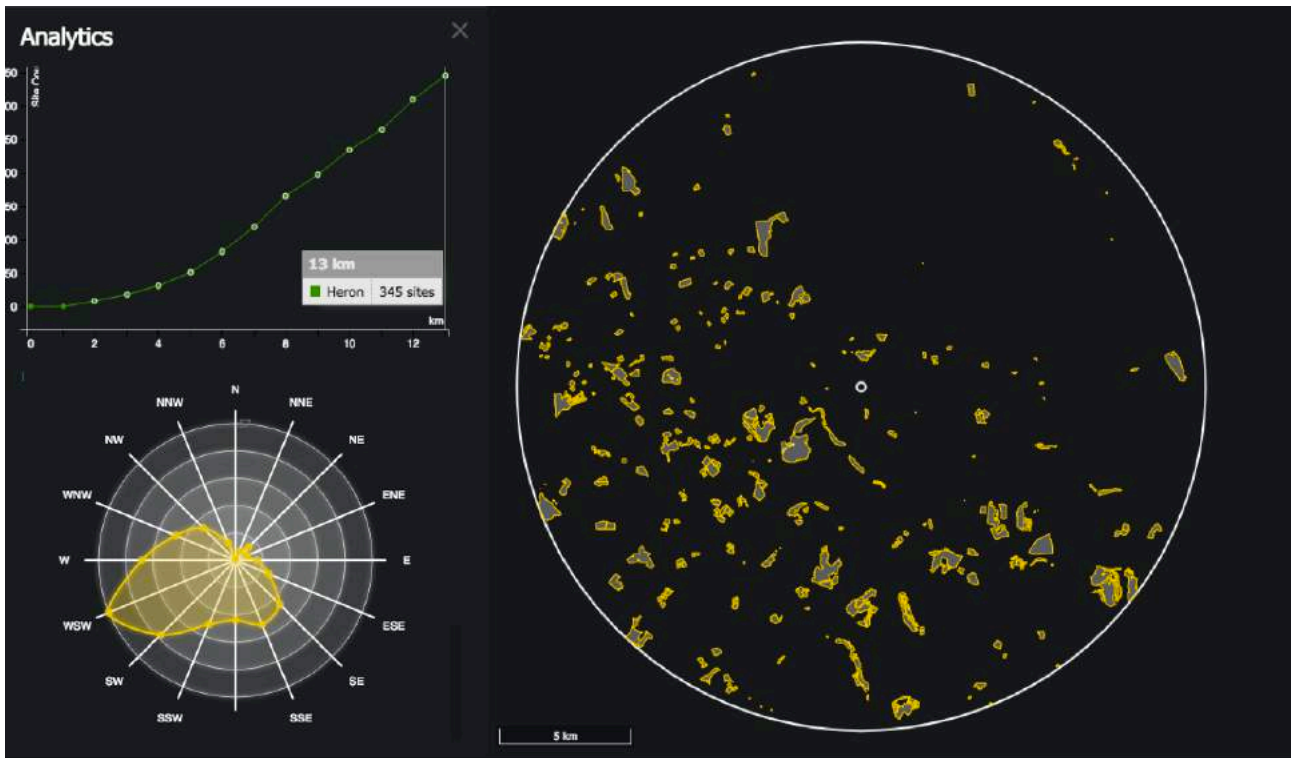
Crow sites are described below:



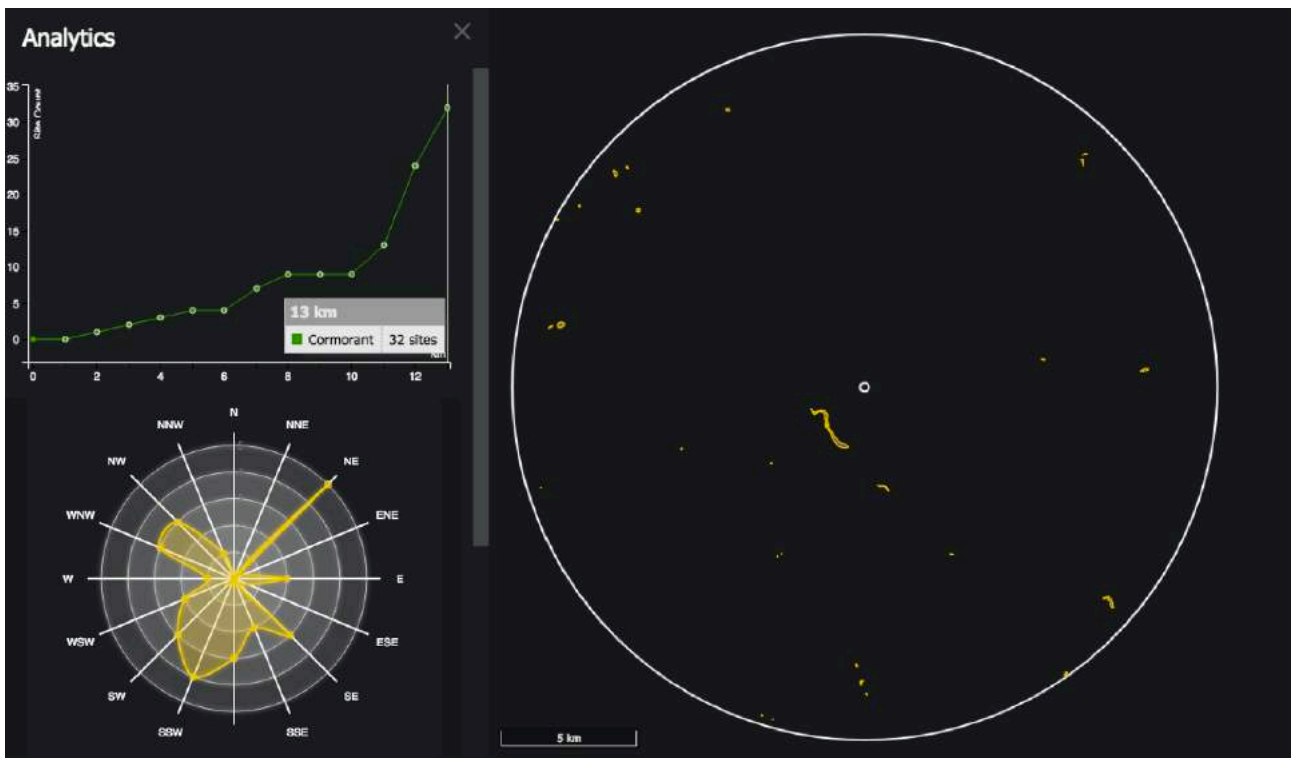
Pheasant sites are described below:



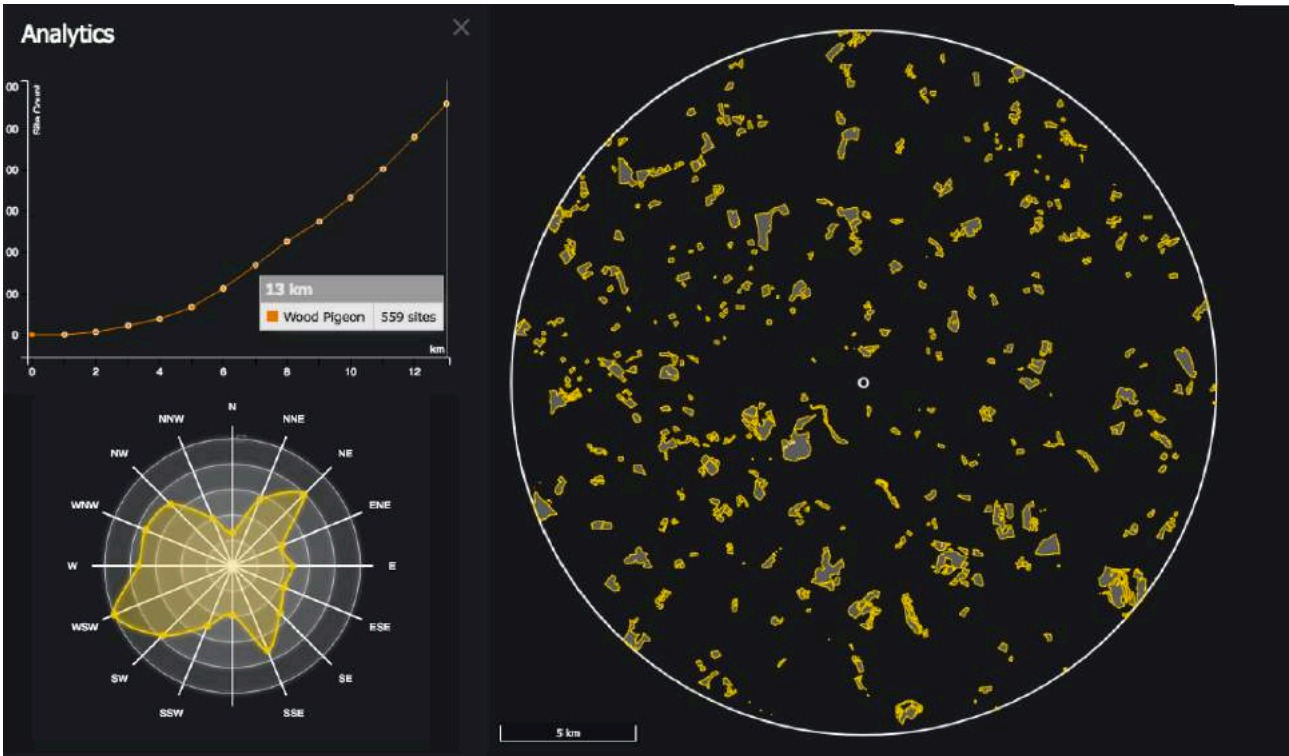
Heron sites are described below:



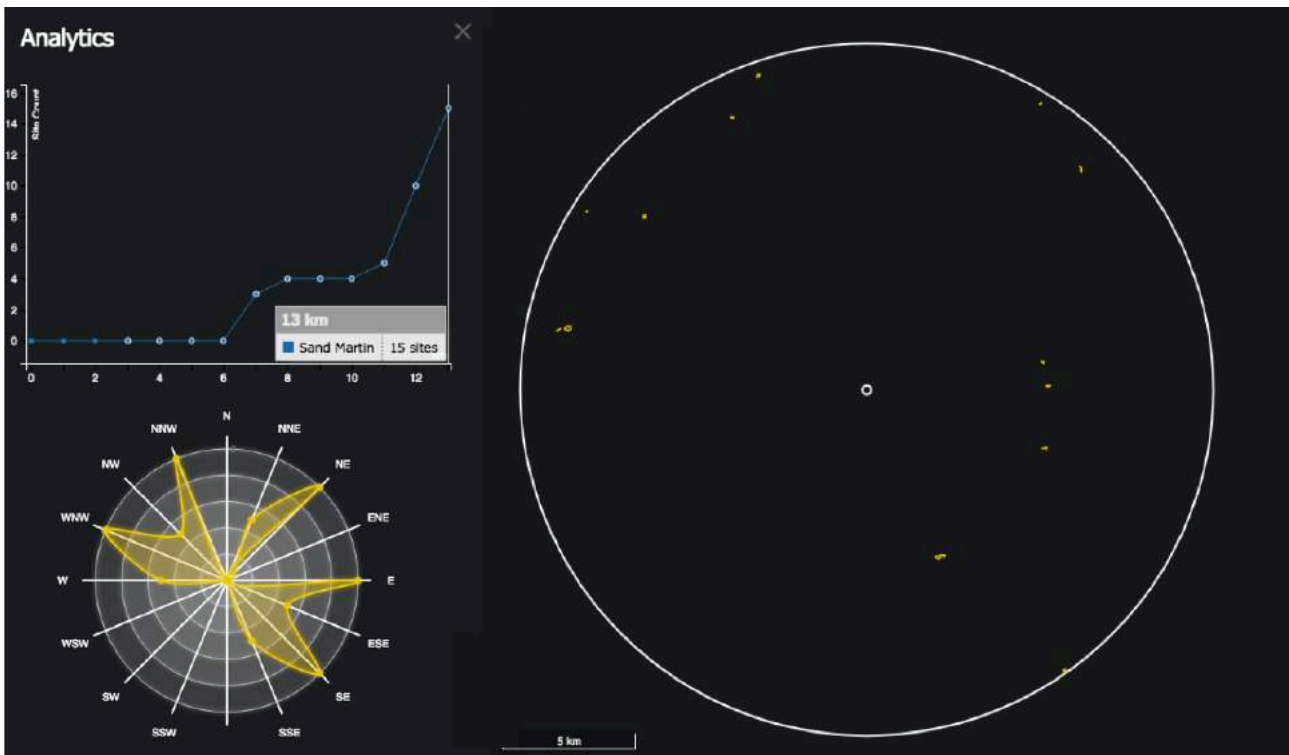
Cormorant sites are described below:



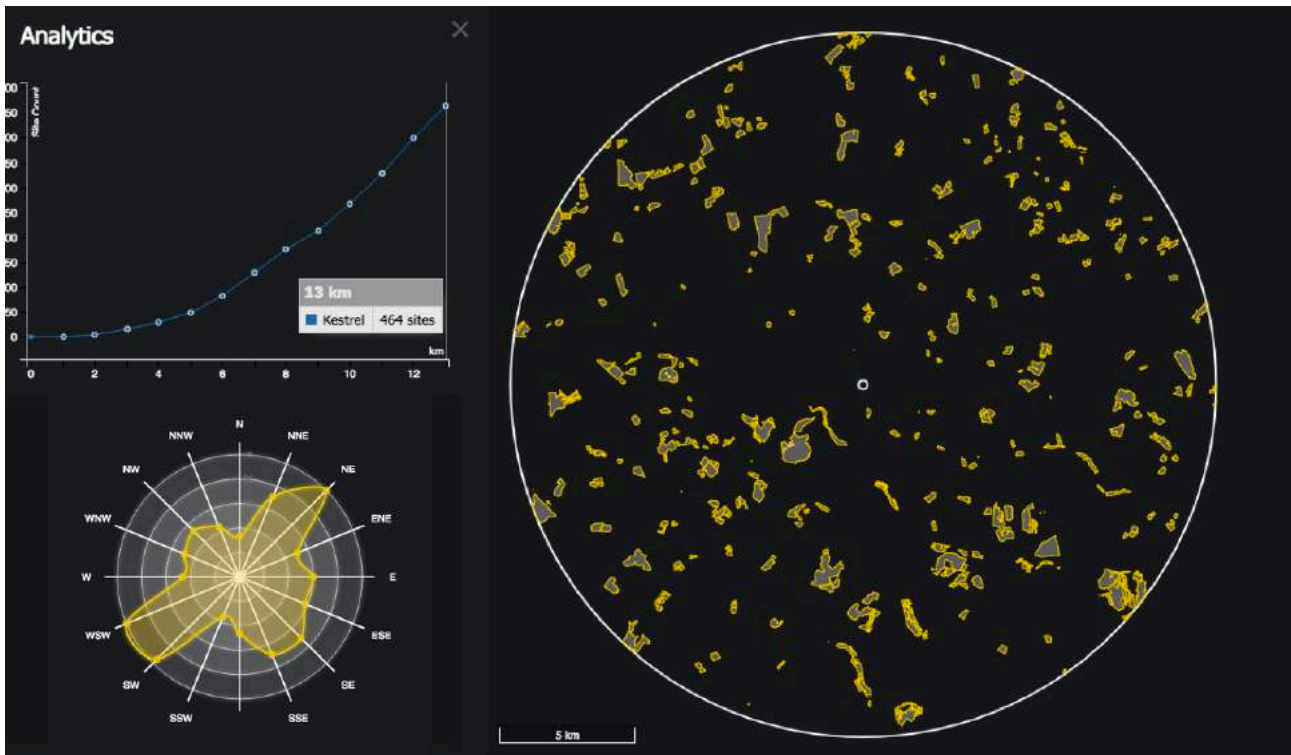
Wood Pigeon sites are described below:



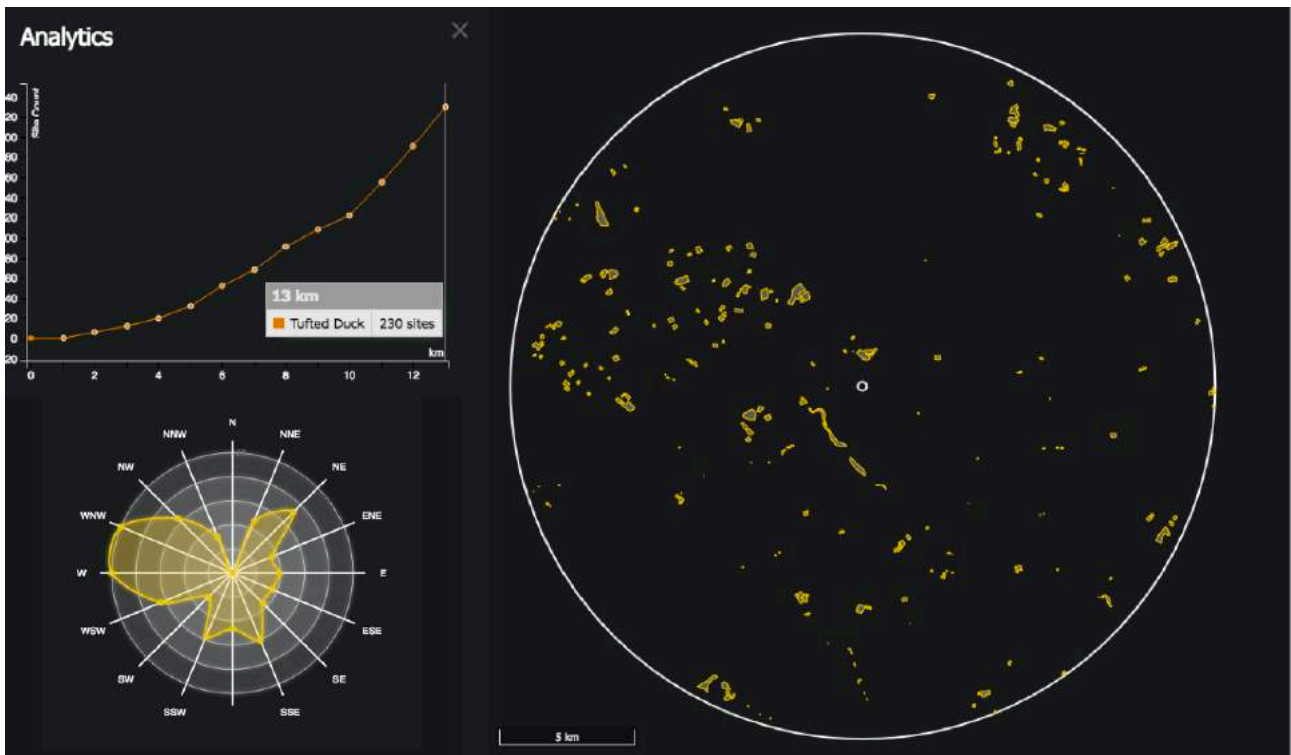
Sand Martin sites are described below:



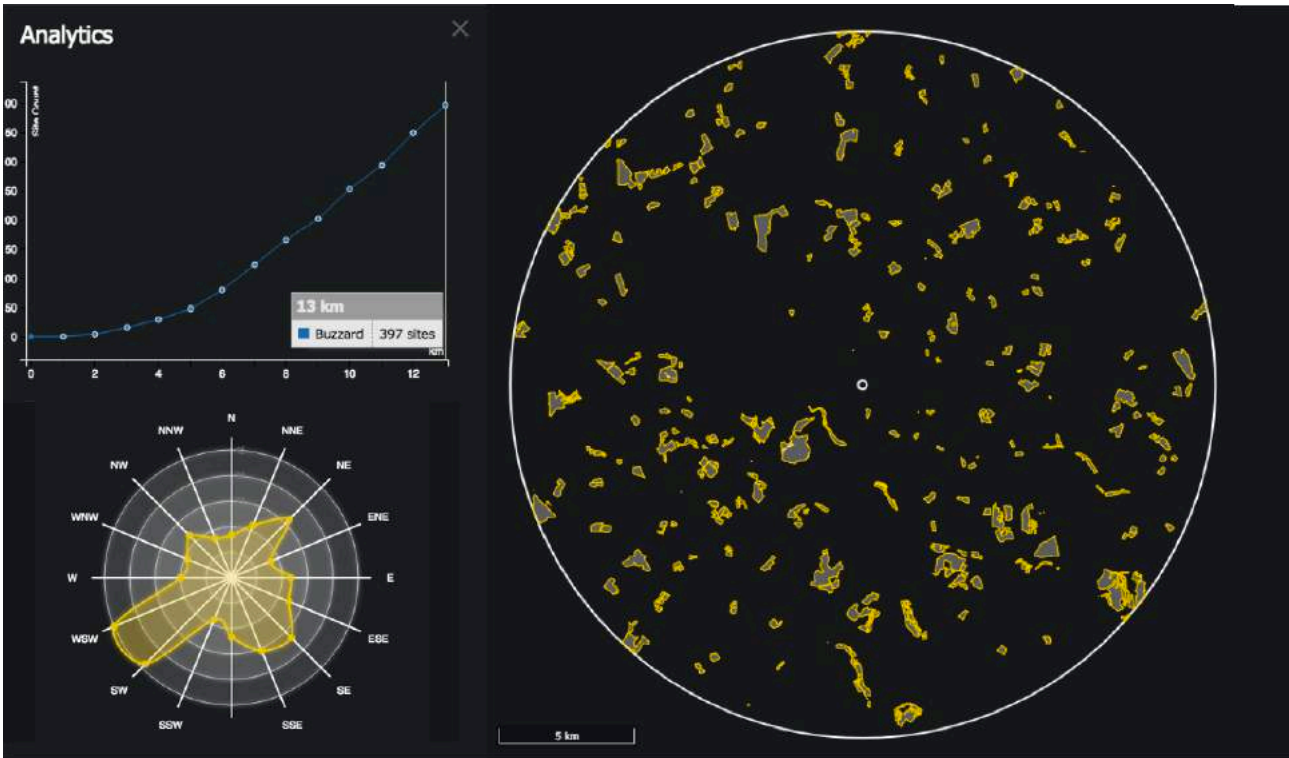
Kestrel sites are described below:



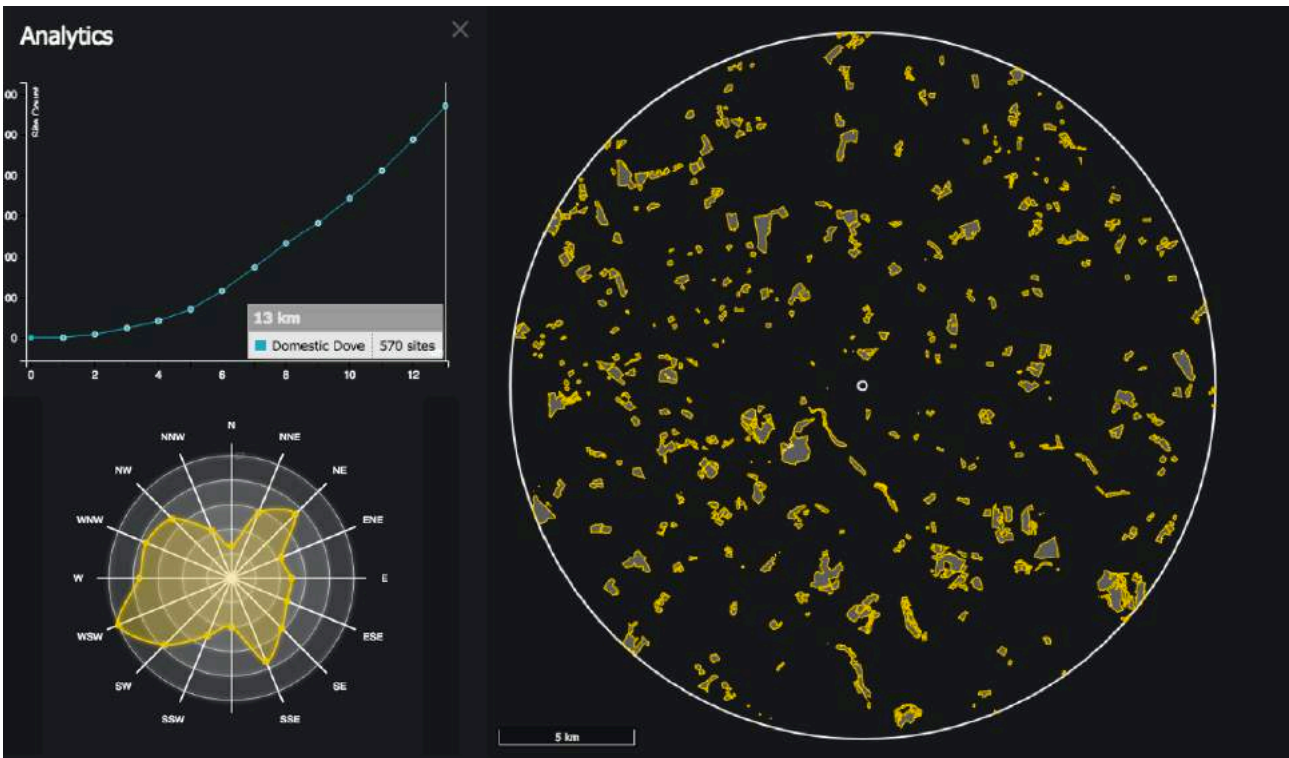
Tufted Duck sites are described below:



Buzzard sites are described below:

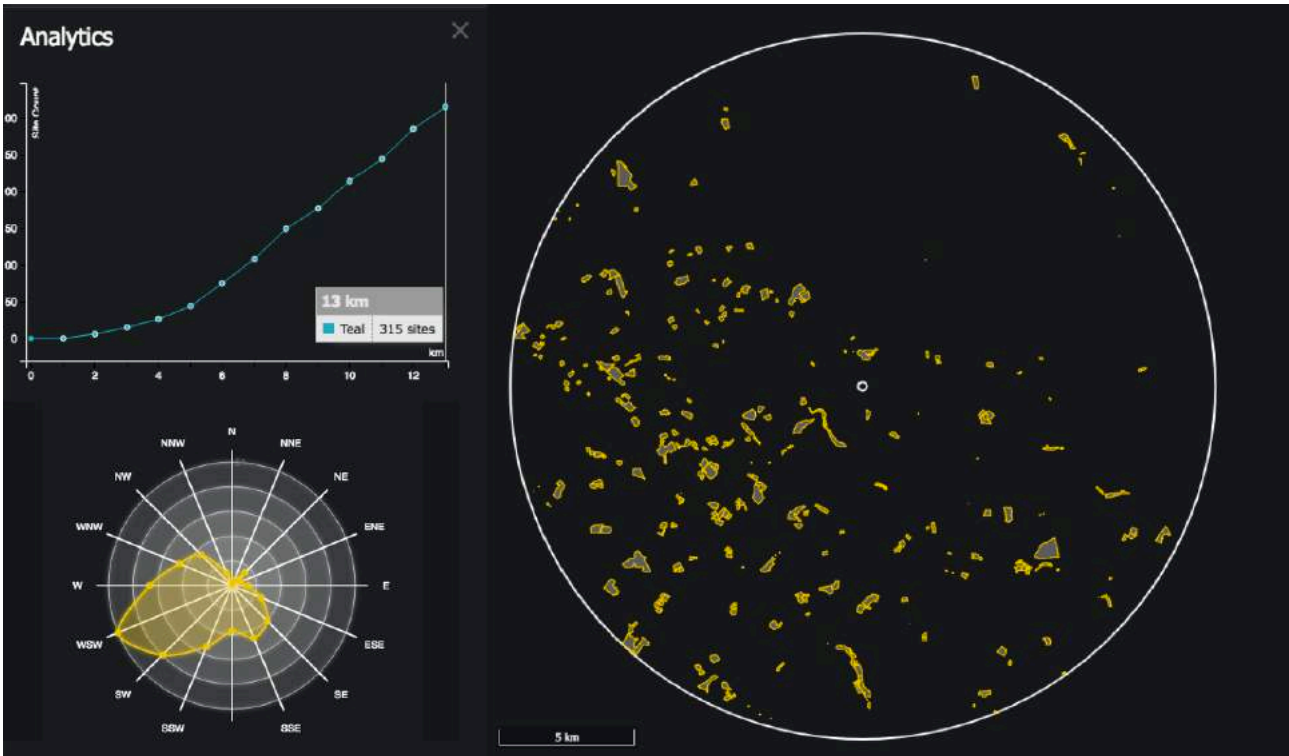


Domestic Dove sites are described below:

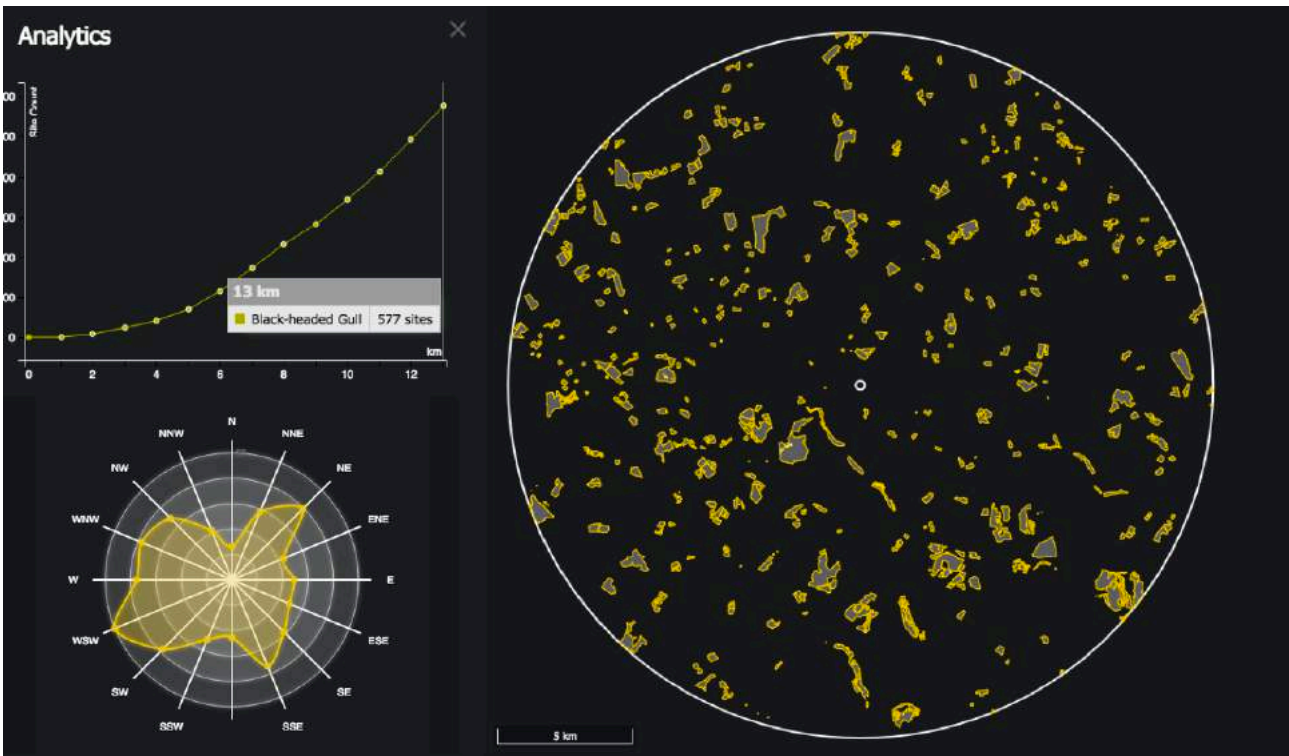




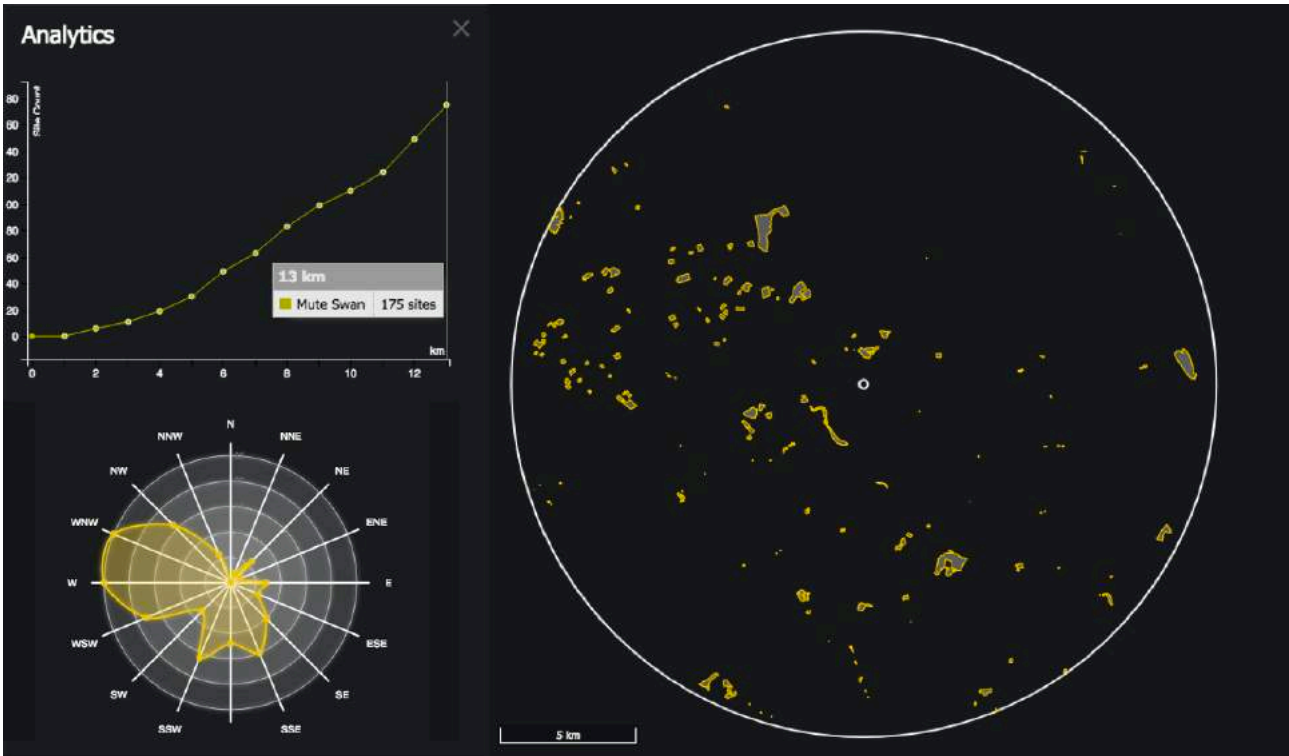
Teal sites are described below:



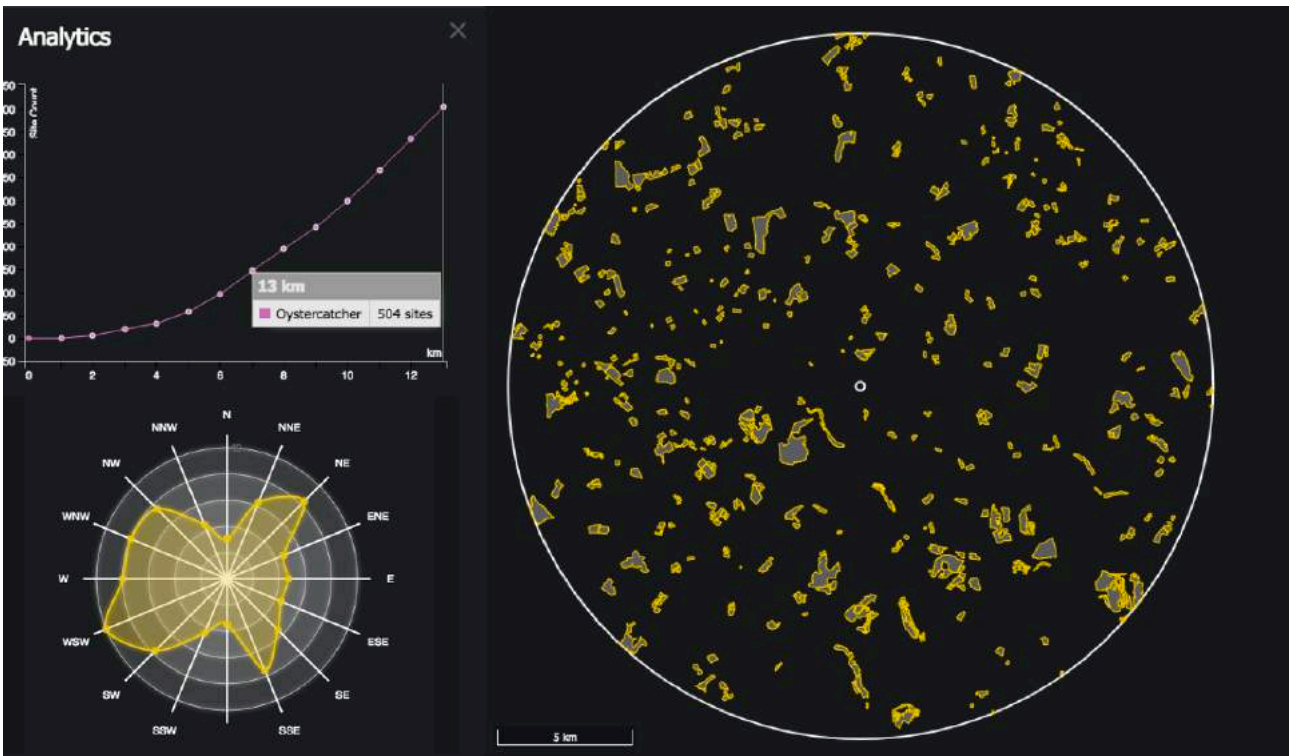
Black-headed Gull sites are described below:



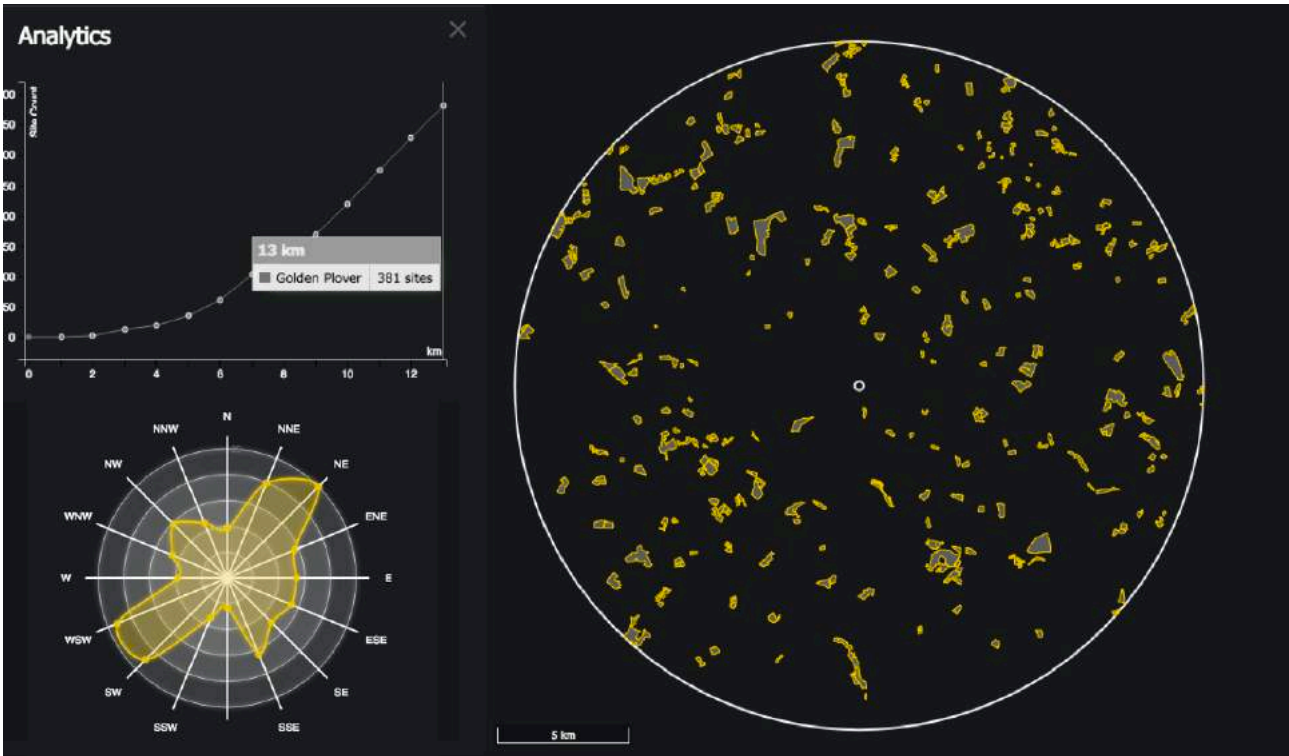
Mute Swan sites are described below:



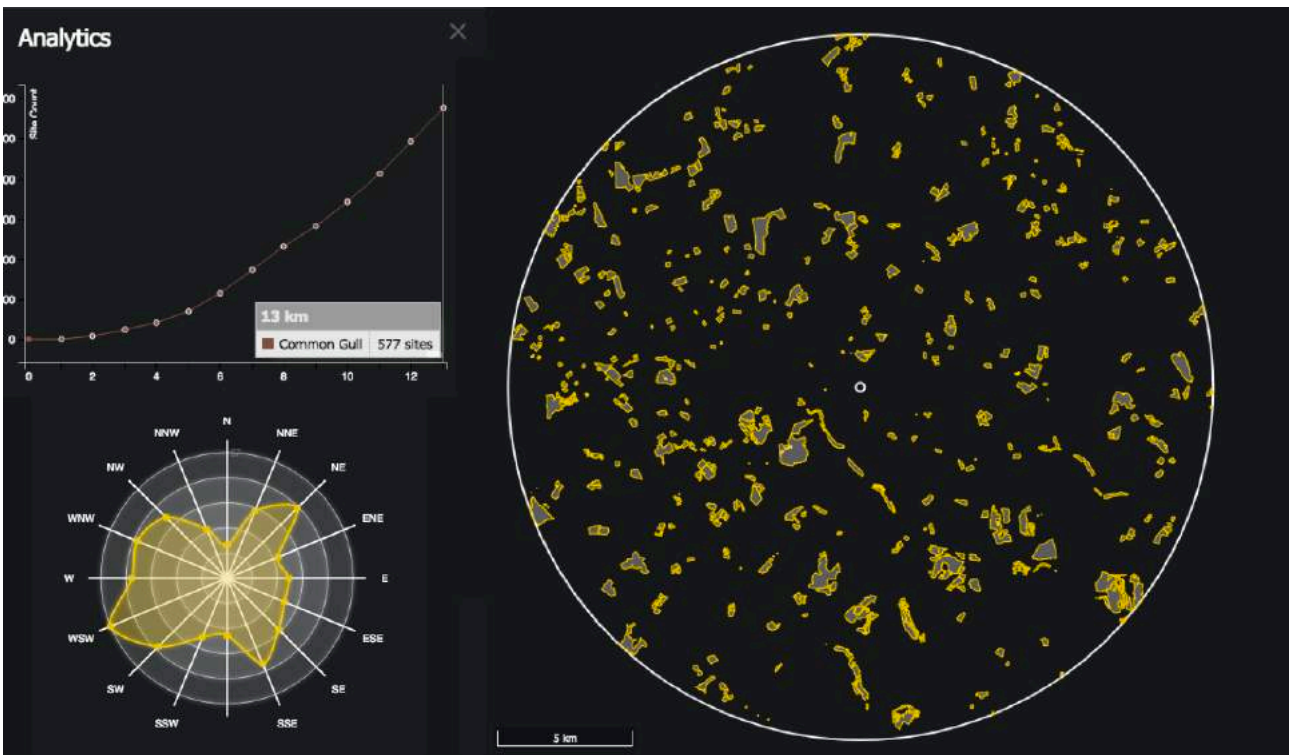
Oystercatcher sites are described below:



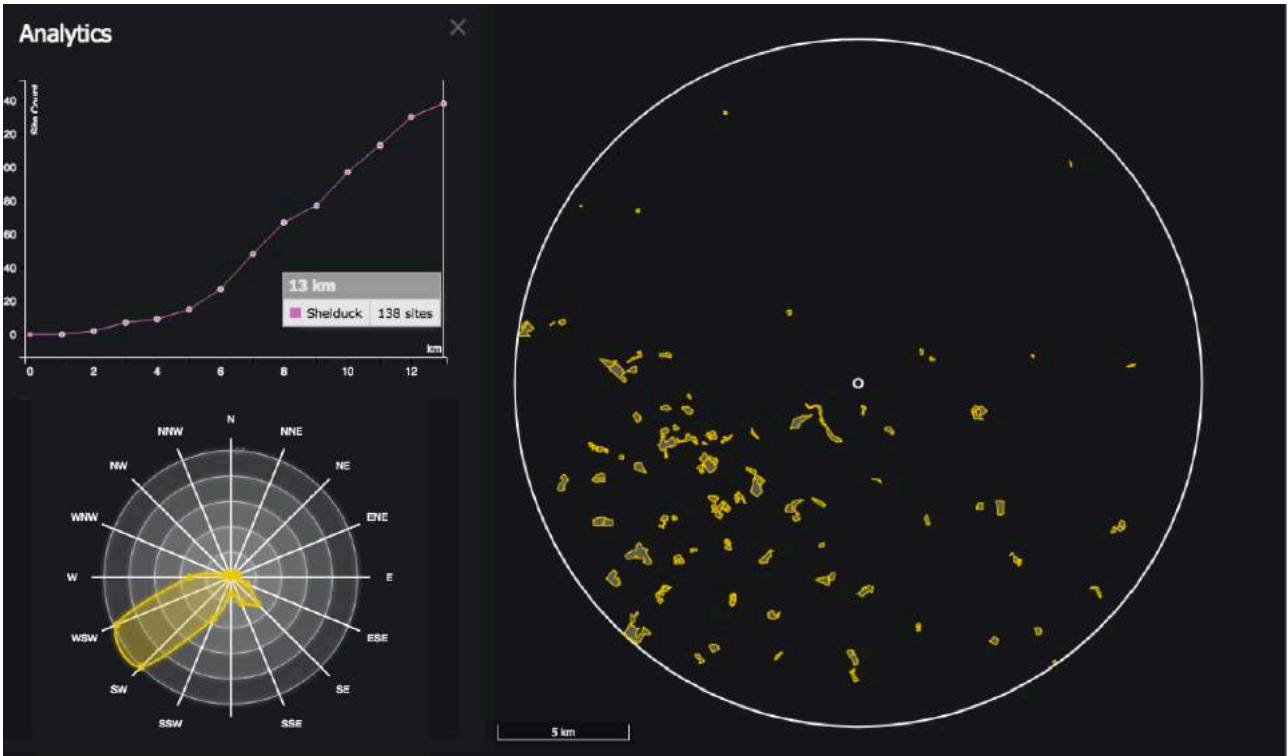
Golden Glover sites are described below:



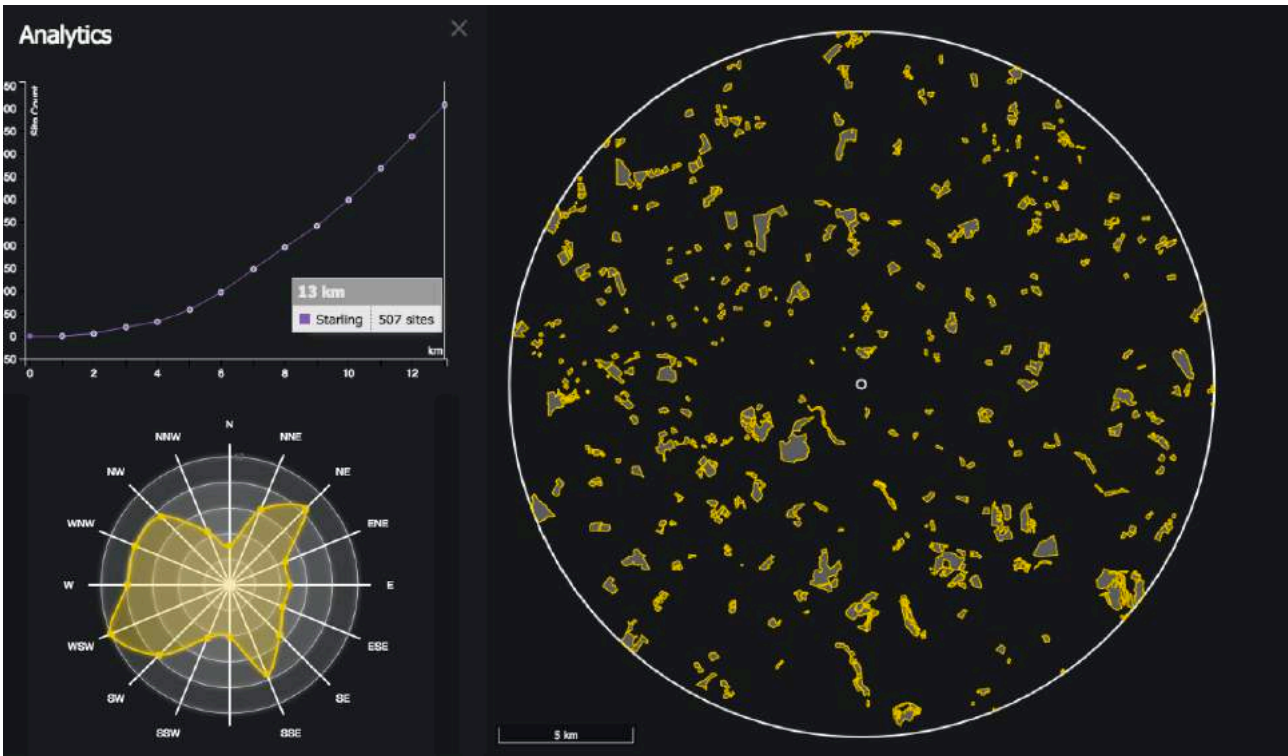
Common Gull sites are described below:



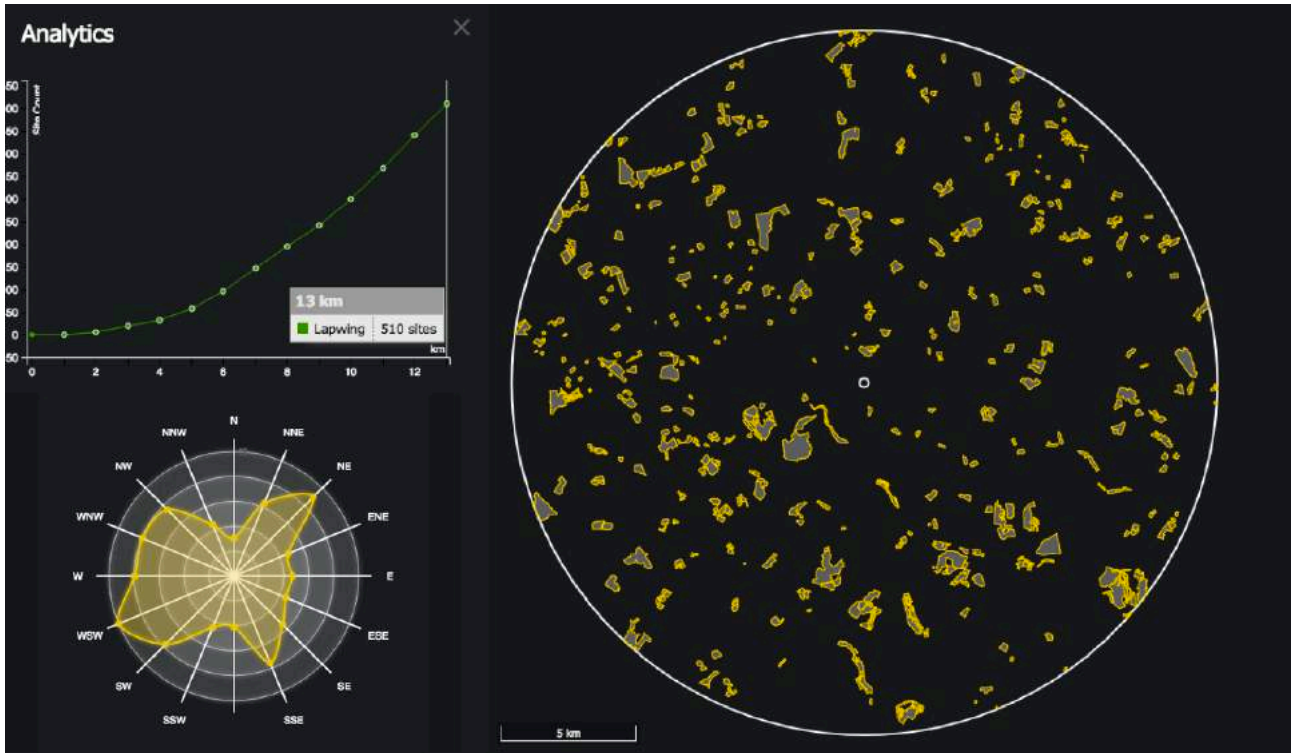
Shelduck sites are described below:



Starling sites are described below:



Lapwing sites are described below:

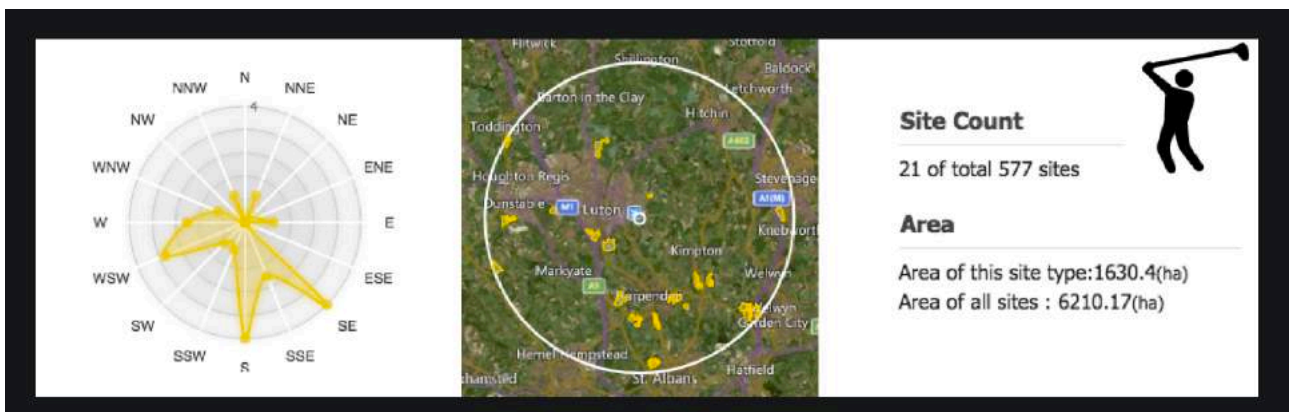


### Site type description and distribution

In this section we will go through the individual site types and look at the distribution of the specific sites, density of sites and the total area covered in the 13 km zone.

#### Golf course

Open area scattered with ponds and covered by very short and well managed grass



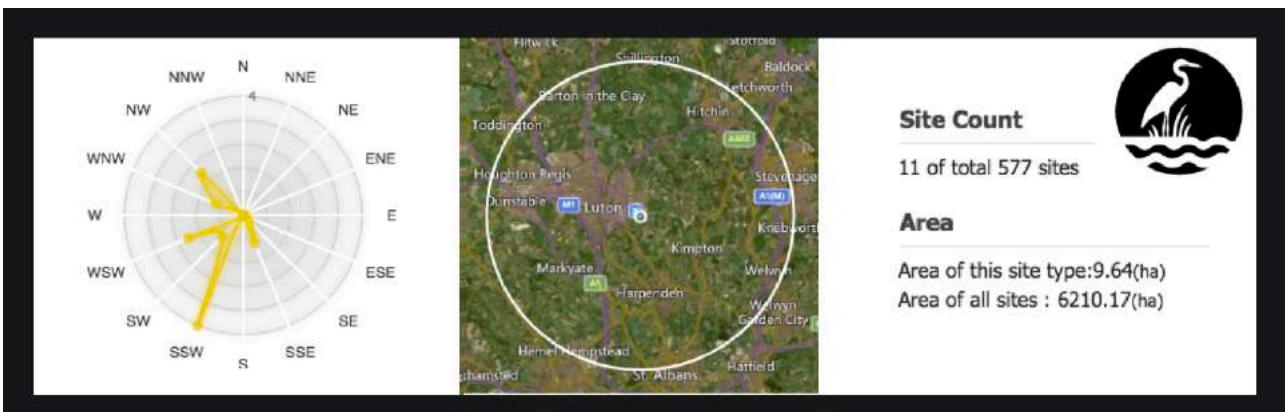
### Pasture

Sown grass area used for livestock grassing



### Water retention pond

An artificial pond created to collect and store surplus water



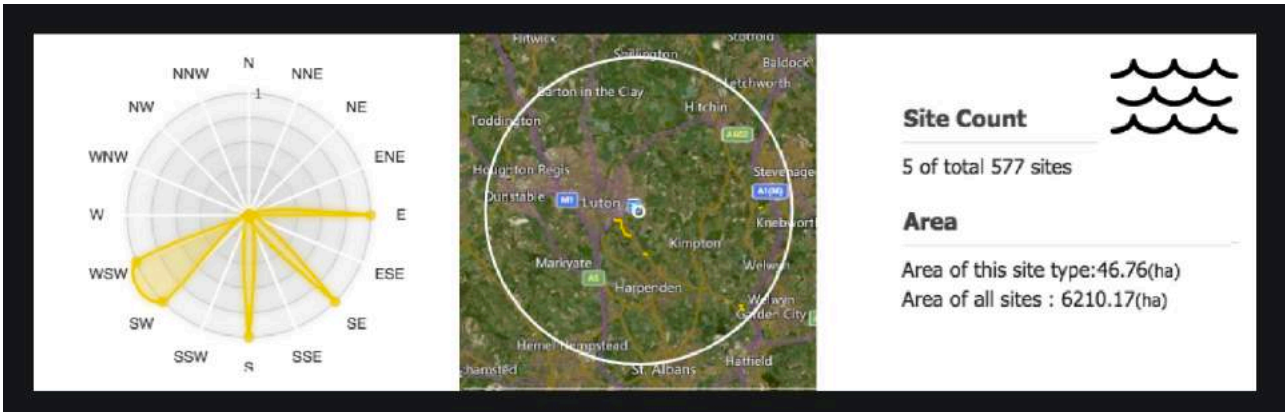
### Sewage works

Open management of sewage and water in the process of being recycled



### Natural lake

Water body not created by excavation



### Basin bog

Water body caused by a natural depression in the bog



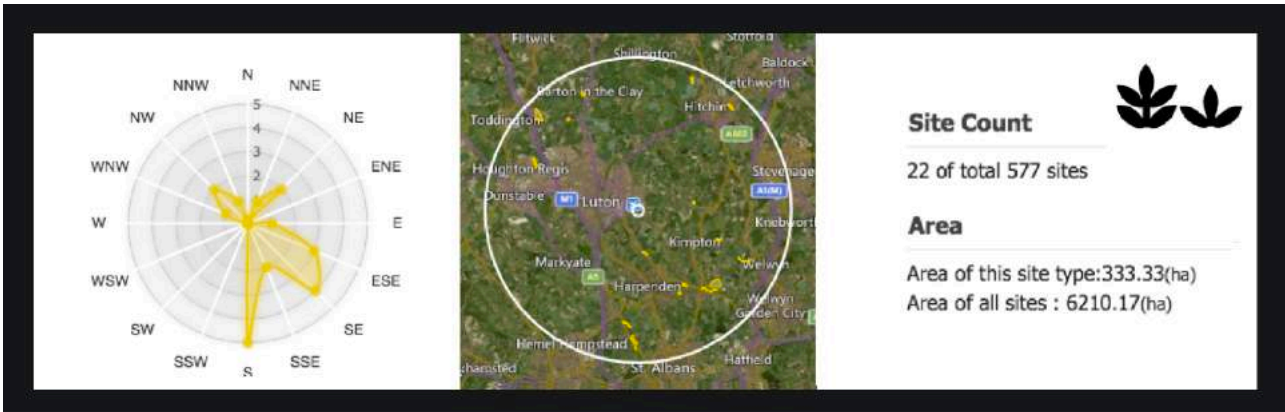
### Mineral extraction point

Mining is the extraction of valuable minerals or other geological materials from the earth from an orebody, lode, vein, seam, reef or placer deposits which forms the mineralized package of economic interest to the miner.



### Meadow

Moist area covered by low natural light-open vegetation.



### Margel excavation pond

Permanent water body created by excavation of margel.



### Playing fields

Open area covered by short grass mostly used for football playing.

