

Overland migration of Arctic Terns through Scarborough

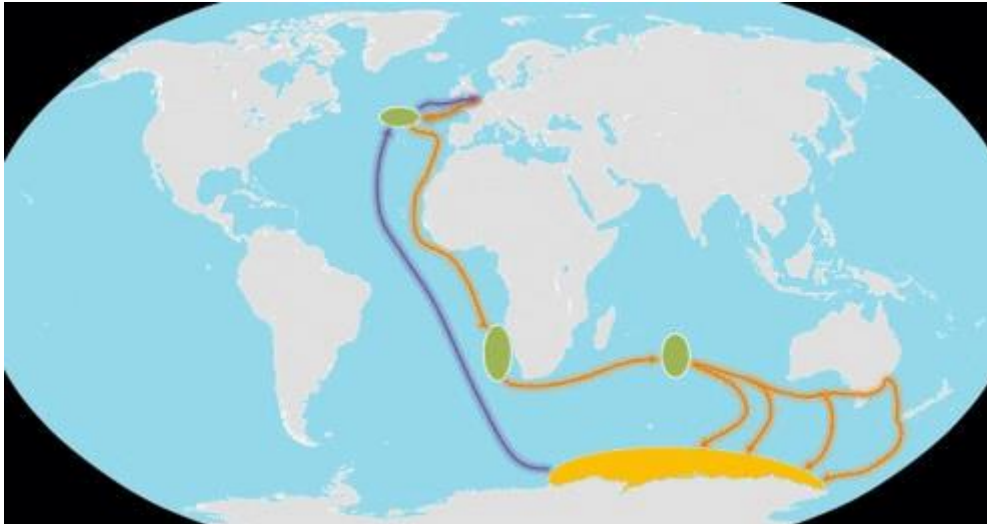
April 2020 witnessed a previously undetected overland movement of Arctic Terns entering the North Sea around Cayton Bay. This triggered off the usual speculation of why here? where do they cross northern England? are there particular weather conditions involved? etc.



Photo – Chris Bell

The Arctic Tern has one of the most amazing migrations on our planet, many breeding colonies are in the Arctic Circle and they undertake an incredible journey to spend the winter in Antarctica. It's a total privilege to witness a tiny part of this journey.

In 2011 five Arctic Terns breeding in Holland were fitted with geolocators, and these were recovered the following summer. The journey they took was remarkable as shown on the map.



Annual migration route of Dutch Arctic Terns as discovered by geolocators (Fijn 2013)

After leaving Holland in late July they flew west to a staging area out in the northern mid-Atlantic where they joined birds from Greenland and Iceland, this mid-Ocean staging area was only discovered in 2007 during similar studies of Greenland and Icelandic breeding Arctic Terns also fitted with geolocators. They then flew south past the west coast of Africa before pausing off Namibia then flying round the tip of South Africa before reaching a previously unknown staging area in the middle of the Indian Ocean. They then flew south-east to spend the winter on the Antarctica coast south of Australia, with one bird getting as far as New Zealand (Fijn 2013). So they flew to Wilkes Land which is on **the far side of Antarctica from the south Atlantic!** Total flying distance from leaving Holland in the summer of 2011 and returning the following spring was around **56,000 miles**, compare this with the circumference of the Earth which is 25,000 miles. Just incredible.

Flying overland across northern England is a straightforward hop in comparison.

Recent studies of this species in the UK, using geolocators, have shown that birds nesting on The Farne Islands, Northumberland cross overland on a broad front from the Irish Sea. An analysis of some 9,054 BTO Birdtrack inland records 1966-2017 for this species was also made as part of this study. This showed the majority of records were in mid to southern England, and concentrations in data along three southwest to northeast orientations. These three lowland orientations corresponded to the River Trent and floodplain, north of the North Wessex Downs and Chiltern escarpment, and The Thames floodplain (Redfern 2019).

In April 2020 the Covid-19 Lockdown restrictions resulted in increased observer coverage at Cayton Bay, Scarborough and the area of Gristhorpe Cliffs at the south end of the bay. The period 20th to 22nd April experienced fresh easterly winds, clear skies with high pressure dominating (force 5 easterly on the first two days, force 3 ENE on 22nd). A total of 273 Arctic Terns were counted moving out into the North Sea in an easterly or south-easterly direction, with smaller numbers taking a more northeast line on the 22nd as the winds had

veered to a ENE direction. This is an unprecedented movement for Scarborough. The daily totals for Cayton Bay from morning observations of 3-4 hours:-

20th April – 157

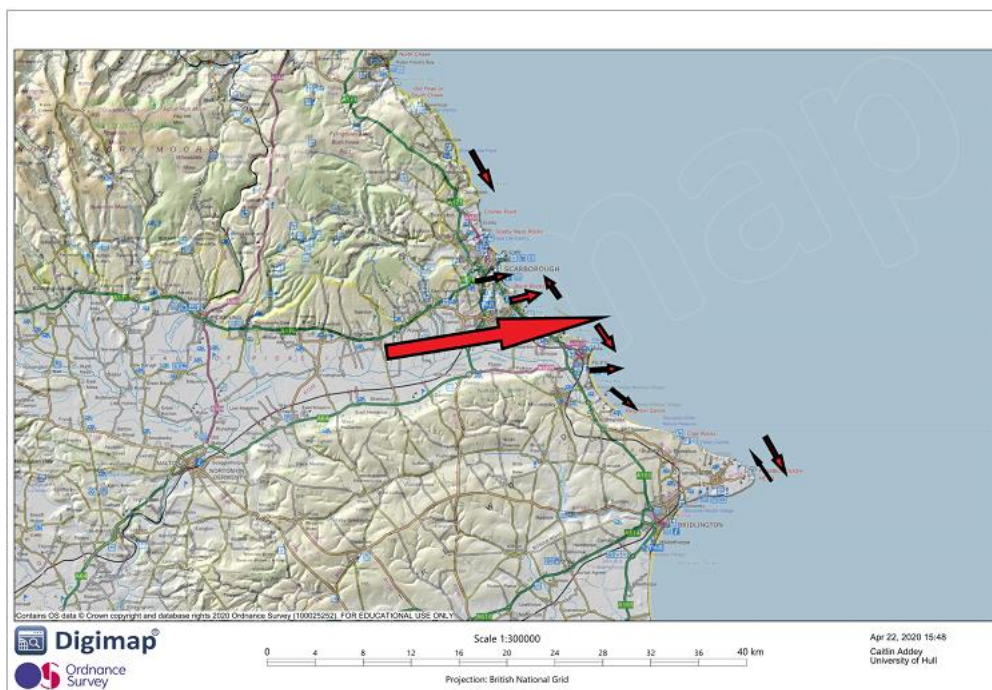
21st April – 7

22nd April – 109

The majority were observed coming out from central Cayton Bay although on one occasion three flew directly over one observer coming from inland at Gristhorpe Cliff. Cayton Bay sits at the eastern edge of the Vale of Pickering, a low-lying area of land running west to east between the higher North Yorkshire Moors to the north and Yorkshire Wolds to the south.

In previous years on news of good spring inland tern movements observers have often spent time at Wykeham Lakes which is located roughly 10Km to the west of Cayton Bay. Arctic Terns were often observed arriving from the southwest and west and leaving to the east or northeast. It seems logical to assume that the Wykeham Lakes complex is a draw to the species and has a channelling effect concentrating flocks, particularly in easterly winds, towards Cayton Bay. **Figure 1** shows records and directions of birds published in Scarborough and YNU Bird Reports 1995-2019 (2017 & 2019 Scarborough Reports in prep). **Figure 2** shows other Scarborough inland Arctic Tern observations.

On these three days in April 2020 observers at another five coastal watchpoints were present from Long Nab, Burniston in the north to Flamborough Head in the south, some 32km of coastline. In addition one observer was covering the valley running west from South Bay, Scarborough. The totals at other coastal sites locally were small in comparison to the numbers moving out east at Cayton Bay, this has always been the case in comparison to much larger numbers moving out further south in Yorkshire at The Humber. It was clear from these observations that birds as suspected were not moving on a broad front when hitting the east coast in these conditions but seemed to have been funnelled into the eastern section of The Vale of Pickering.



Flight direction of Arctic Terns along the mid Yorkshire coast 20th-22nd April 2020

Totals of Arctic Terns 20th-22nd April along the mid Yorkshire coast plus counts at Spurn Bird Observatory for comparison.

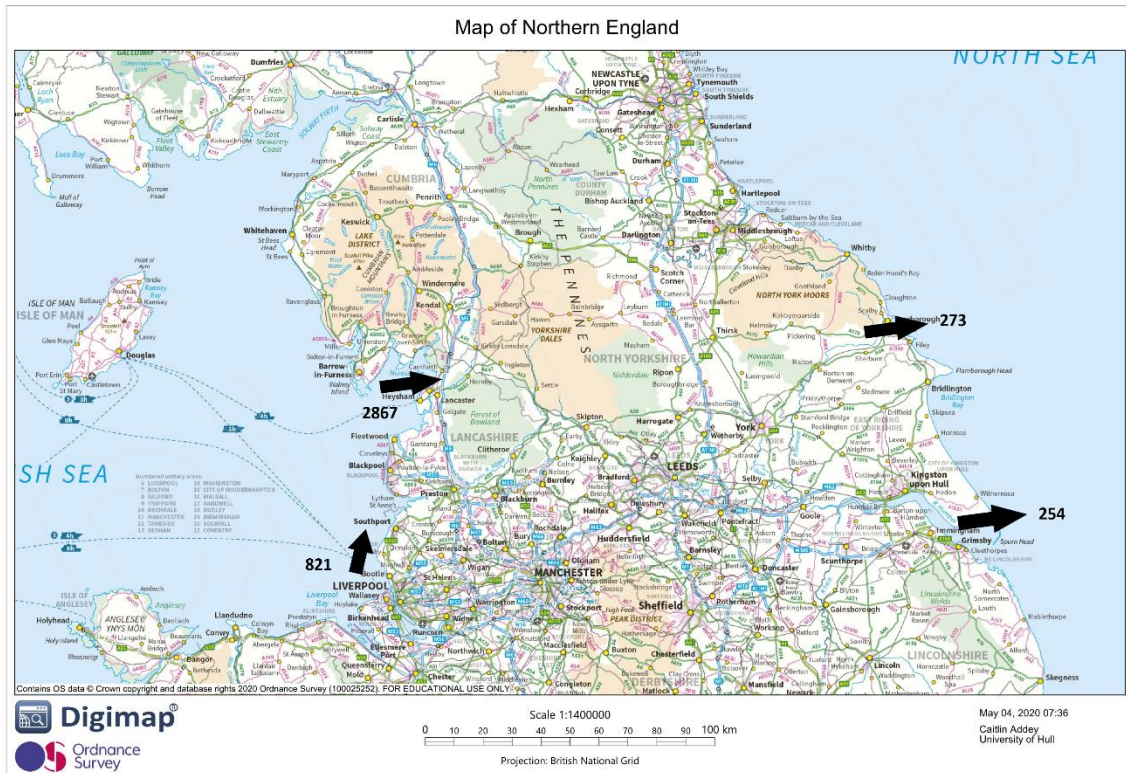
Site	20 th April	21 st April	22 nd April	Observer(s)
Long Nab	2 south	None	5 south	Nick Addey
Scarborough	2 east	None	1 east	Michael McNaghten
South Cliff	1 north	None	13 ENE, 9 north	Chris Bradshaw
Filey Brigg	4 south	9 south	2 south	John Sanderson
Hunmanby Gap	5 east (Filey Bay)	None	4 south	Keith Clarkson
Flamborough	1 north, 1 south	None	3 south	Brett Richards
Cayton Bay	157 east	7 east	109 east	Dave Bywater/John Harwood
Spurn Head	85 east	13 east	156 east	Jacob Spinks



Sites with daily morning observations 20th-22nd April 2020

The Lancashire link?

During 20th to 22nd April Lancashire too observed morning movements of Arctic Terns heading into the easterly winds. The three days in question had daily coverage at Formby Point and Heysham Bird Observatory. Both sites experienced a sudden increase in Arctic Terns. Heysham observed birds leaving in easterly and north-easterly directions whereas Formby Point logged most north on Trektellen.org but did comment based on their experience of the site that they were birds about to leave east on their inland movement.



Arctic Tern movements out of the Irish Sea and into the North Sea 20th-22nd April 2020 (cumulative 3 day totals from Formby Point, Heysham Bird Observatory, Cayton Bay and Spurn Bird Observatory)

Discussion

Results using geolocators suggest that the overland route to and from the Irish Sea is a consistent migration strategy and not a result of particular weather conditions. However good feeding conditions in the Irish Sea and North Atlantic may also be a factor encouraging migration via an overland route across the UK rather than via the English Channel. Hromadkova (2020) using results from Svalbard Arctic Terns fitted with geolocators found that they take advantage of tailwind support on both spring and autumn migrations. Based on these findings a south-west to north-east or west to east route would be expected for birds exiting the North Atlantic to breeding grounds in the North Sea and further east. It is interesting that the geocator positions for Farne Island birds has a south-west to north-westerly bias, further north than the inland *BirdTrack* records, raising the question of whether the *BirdTrack* records across south and east England relate to birds from Scandinavian and Baltic populations (Redfern 2019). Vinicombe (2014) having analysed data from Cap Gris Nez and Dungeness confirmed that Arctic Terns do not use the English

Channel in significant numbers, maximum counts in the low hundreds rather than thousands.

Observations from inland waterbodies suggest it is often adverse weather condition that sees an increase in records, particularly in the peak spring migration period of late April to mid-May. A very significant overland passage in 1947 was thought to result after a period of strong south-westerly winds blowing flocks moving up the Irish Sea into the Bristol Channel and then overland on a wide front from Lancashire to the south Midlands (Kramer D, 1995). Vinicombe (2014) came to the conclusion that strong westerlies played a part during Arctic Tern influxes into the Severn estuary. Kramer looked at weather patterns versus influxes and came to the conclusion that Arctic Terns normally migrate across England, but probably at such a height that they are not usually recorded unless brought down by adverse winds. He also highlighted another potential regular route as in 1991 a flock of 438 were observed flying east along The Solway. **Figure 1** shows that 16 out of 18 records of birds observed moving through Wykeham Lakes occurred when winds were anywhere between north and southeast, 68% of these in fresh to strong winds (Force 4 or more). Roadhouse (2016) comments that movements east out of the Humber at Spurn Head occur more frequently in easterly or north-easterly winds, flying directly into the wind. The largest spring movement there was in 2006 when 2,061 flew east. The highest day counts were 1,030 on 2nd May 1998, 974 on 30th April 2006 and 507 on 30th April 1995.

Smith (2015) analysed Arctic Terns recorded in spring past Heysham Bird Observatory in Lancashire. He found that three-figure daily totals from mid-April into May are commonplace there. Maximum counts are usually around the 400 to 500 mark but 2011, to quote the Lancashire Bird Report, was 'phenomenal' with a total of 14,157 birds counted and the max count an amazing 8,153 on May 3rd. Sight observations strongly suggest that these birds gain height in the evening before heading north-east, so presumably crossing the country to the North Sea over-night; it therefore seems likely that these birds are part of the very large population breeding in Scandinavia and Baltic States. He stated the birds on the Dee estuary in spring are probably part of this same movement but much smaller numbers are involved with a total of just 12 double-figure counts in April and May for the years 2005 to 2013.

Mather (1986) gave details of two chicks ringed at an Estonian breeding colony being found dead in August in Yorkshire, plus birds ringed in Germany and Sweden have been recovered in Yorkshire.

I was rather surprised that observations suggested birds leaving Heysham in the evening. This may be the case for some but a read of the Heysham Bird Observatory blog for 3rd May 2011 stated that all but 195 of the 8,153 birds had moved off east or northeast between 06.00-10.30 hrs. This area of the Irish Sea is due west of Scarborough so may well be the starting point for some of the Vale of Pickering birds, particularly in easterly winds, assuming the birds are flying predominantly directly into the wind.

Sizeable flocks moving over the Yorkshire Wolds to the southwest of Scarborough have been observed going in a northeast direction in spring highlighting flocks moving on a broad front

over the Wolds. These too occurred in periods of northeast winds and the flock size was often 70 or more (A Hutt *pers comm*). A northeast line from Middleton-on-the -Wolds takes you to the head of the Vale of Pickering.

The North Yorkshire Moors rising higher than the Yorkshire Wolds may act as a barrier in fresh winds and deflect birds east along the Vale of Pickering.

I expect we would be amazed at the number of Arctic Terns that actually pass through the Irish Sea and overland on migration if only we could track them all - unfortunately most fly over at great height or migrate at night.

I'm sure more attention will be paid in future to birds moving out at Cayton Bay. A co-ordinated watch with someone at Wykeham Lakes would be interesting to compare numbers. Based on previous observations at the lakes I suspect only a small proportion of the Vale of Pickering birds are visible from there. One to find out.



Photo – Chris Bell

Figure 1. Observations of Arctic Terns moving through Wykeham Lakes in spring 1995-2019 (feeding birds excluded).

Date	Number	Flight direction	Wind
29/04/2011	17	East	N4
02/05/2011	2	East	E4/5
29/04/2012	2	East	NE8
02/05/2012	9	Northeast	NE6
20/04/2014	5	Northeast	NE4/5
21/04/2014	3	Northeast	ENE4
04/05/2014	1	North	SW3
08/05/2016	9	East	E3
09/05/2016	18	East	ENE3
11/05/2016	37	Northeast	NE4
27/05/2016	2	Northeast	NE2
29/05/2016	1	Northeast	N4
30/04/2017	41	Northeast	SE3/4
01/05/2017	3	South	ESE3
01/05/2017	24	East	ESE3
04/05/2019	3	Northeast	N7
05/05/2019	2	North	NNW4
08/05/2019	3	East	ESE5/6

Figure2. Observations of inland Arctic Terns at sites in the Scarborough district east of Wykeham Lakes.

Date	Site	Number	Direction	Winds
25/05/2012	Lebberston Carr	15	East	E2
27/04/2014	Spring Bank, Scarborough	12	Northeast	ENE2
14/05/2016	Burton Riggs	15	East	NNW5
30/04/2017	Crossgates	4	East	SE3/4
17/04/2019	Seamer Tip	14	East	NE3

Acknowledgements

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All observers had to abide by Covid-19 government social distancing guidelines which meant that Cayton Bay observations were done in shifts to avoid two observers present at one time.

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