Tracking birds of the Humber Estuary: a study of a near-threatened species – The Curlew (*Numenius arquata*)

Lucas Mander\(^1\), Rodney Forster\(^1\) and Niall Burton\(^2\)

\(^1\)Institute of Estuarine & Coastal Studies (IECS), School of Environmental Sciences, University of Hull, Hull, HU6 7RX

\(^2\)British Trust for Ornithology (BTO)

E-mail: L.mander@hull.ac.uk – Twitter: @lucasmander
Nine major shorebirds flyways

Shorebird decline along the East Asian Australasian Flyway linked to habitat deterioration and degradation in the Yellow Sea.

**Carry-over effects** occur when processes in one season influence the success of an individual in the following season.
The tribe of Numeniini: a group prone to extinction

<table>
<thead>
<tr>
<th>Numeniini</th>
<th>IUCN Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eskimo Curlew</td>
<td>Critically endangered (Possibly extinct in the case of Eskimo Curlew)</td>
</tr>
<tr>
<td>Slender-billed Curlew</td>
<td></td>
</tr>
<tr>
<td>Far Eastern Curlew</td>
<td>Endangered</td>
</tr>
<tr>
<td>Bristle-thighed Curlew</td>
<td>Vulnerable</td>
</tr>
<tr>
<td>Eurasian Curlew</td>
<td>Near-threatened</td>
</tr>
<tr>
<td>Bar-tailed Godwit</td>
<td></td>
</tr>
<tr>
<td>Black-tailed Godwit</td>
<td></td>
</tr>
<tr>
<td>Upland Sandpiper</td>
<td>Least concern</td>
</tr>
<tr>
<td>Whimbrel</td>
<td></td>
</tr>
<tr>
<td>Little Curlew</td>
<td></td>
</tr>
<tr>
<td>Long-billed Curlew</td>
<td></td>
</tr>
<tr>
<td>Marbled Godwit</td>
<td></td>
</tr>
<tr>
<td>Hudsonian Godwit</td>
<td></td>
</tr>
</tbody>
</table>

Tribe of 13 species, of which 2 are probably extinct:

- Eskimo Curlew
- Slender-billed Curlew
Breeding distribution / winter distribution

UK breeding population: 68,000 pairs ~ 25% of the European population

In winter, Britain and Ireland supports ~ 50% of the European population of Curlew with 210,000 birds.

UK has important role to play in Curlew conservation

Source: BTO
Breeding birds

Wintering birds

Curlew: UK annual

Shooting stops in England, Scotland and Wales
Decline in breeding birds

- Habitat change (loss and deterioration of breeding habitats).

- Predation pressure linked to afforestation and predator control.

- Climate change.

*Douglas et al. 2014 J Applied Ecology*

*Renwick et al. 2012 Diversity & Distributions*
Tracking of wintering curlew to improve our understanding of their habitat requirements and their use of newly created habitats i.e. realignment sites on the Humber Estuary.
1- Humber Curlew population

- Seventh sites in the UK for wintering Curlew
- Latest five-year average of 2,806 birds
- Stable population

2- Tracking pilot study


Cook et al. 2016 BTO report

3- Proposed and existing managed realignment sites
Curlew in estuaries: what do we know?

Different strategies: tidal flats vs. terrestrial fields.

(i) Birds feed on the tidal flats more or less through the winter.

(ii) Feed on the fields throughout the winter.

(iii) Feed on tidal flats in autumn and then, as the temperature dropped, move to the fields only returning to tidal flats in bad weather (deep snow, frozen ground) and/or in spring.

Townshend, D.J. 1981, Unpublished Thesis
Sexual dimorphic species

Male and female Curlew side by side
Pete Short (RSBP)

Example of small-scale sexual segregation: Male more frequently recorded field feeding e.g. Tees estuary.

Summer et al. 2012. Wader study group

Townshend, D.J. 1981, Unpublished Thesis
Availability of grassland around the Humber Estuary

Coastal and Floodplain Grazing Marsh

Good quality semi-improved grassland

Source: https://magic.defra.gov.uk/MagicMap.aspx
Aim of the study

- Examine nocturnal activity
- Connectivity between tidal flats and terrestrial habitats
- Use of managed realignment sites

Deploy 20 GPS tag on Curlew on the Humber Estuary
A bit about the tracking technology

- Increasing price and weight
  - VHF radio tags
  - Geolocators
  - GPS loggers
  - PTT (Platform Transmitting Terminal)
GPS/UHF tag

GPS/UHF tags with small solar panel

Glue-mounted on the back between the wings

Transmit data via UHF signal to a base station

Data download from the base station
Mist-netting at Welwick Saltmarsh with the Humber Wader Ringing Group

@lucasmander
Welwick Saltmarsh and ABP Welwick Realignment site
Long Bank Marsh and Klinsea Wetlands
Welwick Curlew
- 961 fixes between 03 February and 05 April (62 days of tracking).

Long Bank Marsh Curlew
- 346 fixes between 17 February and 8 March (20 days of tracking)
Proportion of fixes (%) recorded in farmland and on intertidal habitats

<table>
<thead>
<tr>
<th>Habitats</th>
<th>Welwick Adult – unknown sex</th>
<th>Long Bank Marsh Immature Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved grassland</td>
<td>0.00%</td>
<td>1.45%</td>
</tr>
<tr>
<td>Unimproved grassland</td>
<td>0.00%</td>
<td>52.02%</td>
</tr>
<tr>
<td>Fallow fields</td>
<td>0.00%</td>
<td>15.61%</td>
</tr>
<tr>
<td>Autumn cereals</td>
<td>1.35%</td>
<td>0.29%</td>
</tr>
<tr>
<td>Oil seed rape</td>
<td>4.06%</td>
<td>13.87%</td>
</tr>
<tr>
<td>Intertidal habitats</td>
<td><strong>94.59%</strong></td>
<td><strong>16.76%</strong></td>
</tr>
</tbody>
</table>

- The Welwick Curlew held a territory on the intertidal area.
- The Long Bank Marsh Curlew was more frequently recorded in farmland.
Effect of weather

bird switched roost during ‘beast from the East’
Summary of findings

- High level of site fidelity
- Little use of terrestrial habitats except for short-billed males
- Daytime use of terrestrial fields
- Reliance on ABP welwick realignment site as a roosting site
- Curlew appeared to be territorial when foraging on tidal flats
Examine survival rates of Curlew on the Humber Estuary

**Individual-based Model** follow the decision of each individual in a population as they attempt to meet their daily energy requirement


Curlew feeding on earthworm – Pete Short (RSPB)
Thank you to all bird ringers and helpers:


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