

Birds in the long grass-the emergence of the Curlew (*Numenius arquata*) as an airfield bird hazard species in autumn and winter



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BIRDS IN THE LONG GRASS

- Consensus emerging that the airfield problem has been more or less “solved”
- But what we present here is a cautionary tale of an unexpected development- where long grass in the autumn and winter, heretofore a highly effective deterrent, has proven not to be the case
- Against a “novel” long legged shorebird species- the Eurasian Curlew
- Cascade of consequential problems - starlings

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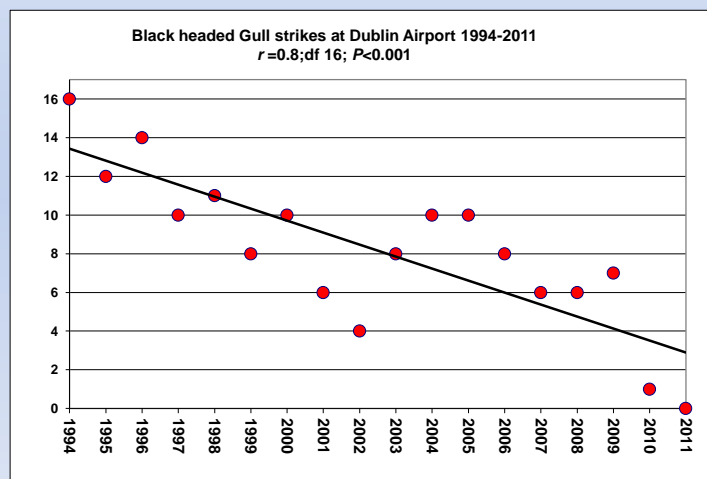
LONG GRASS AT DUBLIN AIRPORT

- First introduced in 1986
- Rigorously maintained ever since
- Three year cycle (“butt-out” every 3 years) + chemical controls including insecticides and lumbricides
- Very successful
- Major decline in multiple strikes and in number of collisions involving starlings, gulls and plover

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DECLINE IN BLACK HEADED GULL (*Chroicocephalus ridibundus*) STRIKES 1994 TO 2011



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THE EURASIAN CURLEW



PHOTO - MICK
MACKEY

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CURLEW (*Numenius arquata arquata*) ARRIVES!

- Occasional sightings of curlew flocks in autumn and winter 1990'S
- But rare and did not stay
- Curlew increasingly seen outside airfield and over-flying active runways
- From 2006 – 2007 visits to airfield more frequent and of longer duration- increased active scaring (hazing)
- 1ST strike November 11TH 2007
- Situation sharply worsened in 2008-2009-through to 2012

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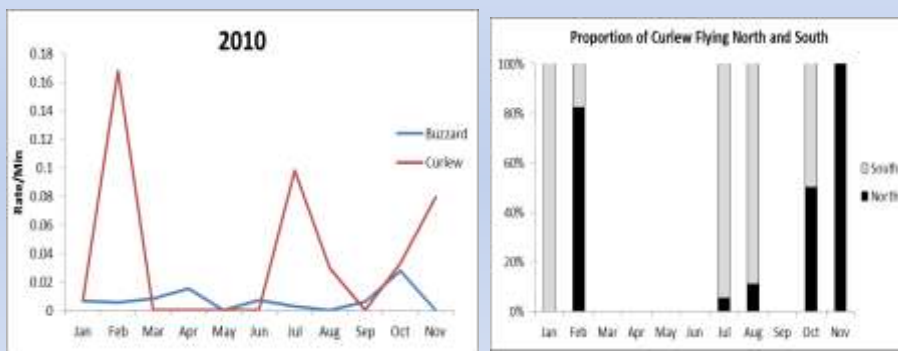
EURASIAN CURLEW

- Large flocking shorebird
- Female maximum weight 1.36KG; male 1.1KG (BWPi V2)
- Primarily estuarine in autumn and winter
- But well known to exploit inland habitats—especially males (e.g. Townshend, 1981)
- Decurved bill well adapted to feeding in fields



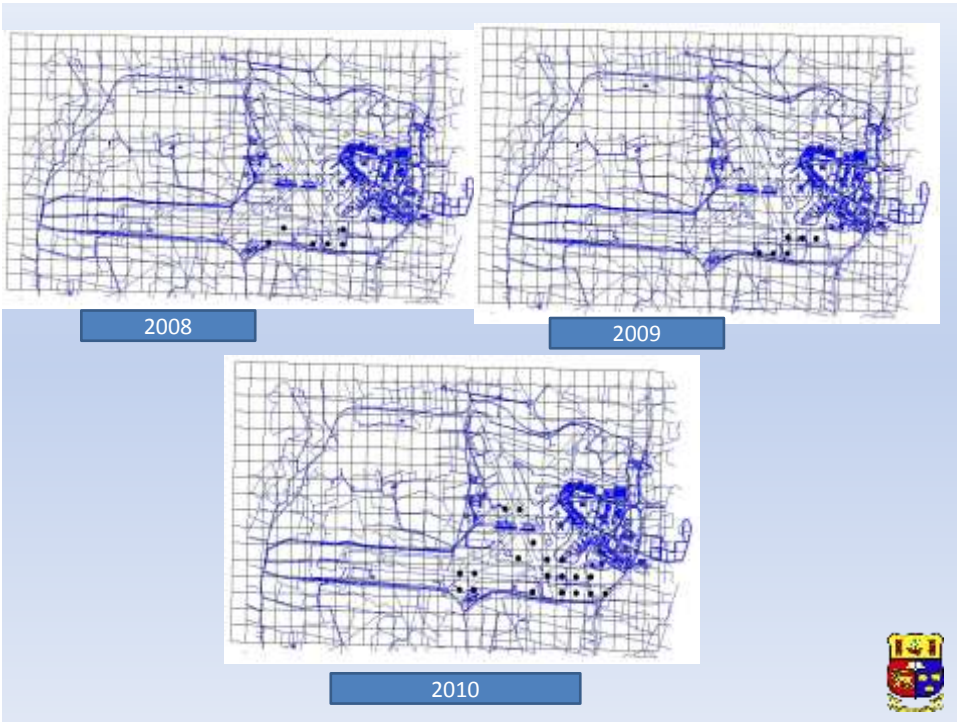
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CURLEW OVER-FLY ACTIVE RUNWAYS

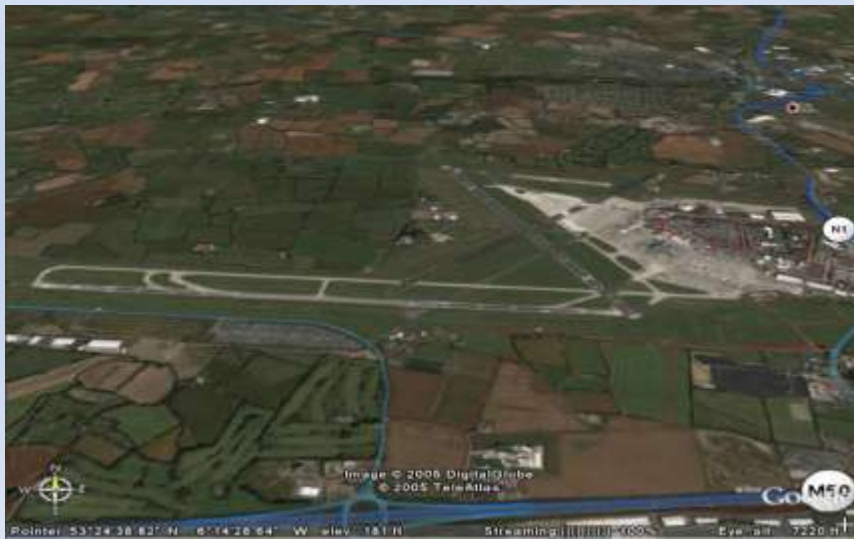


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DUBLIN AIRPORT



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CURLEW STRIKES 2007-2012

YEAR	NUMBER OF STRIKES	DAMAGE*	PERCENT DAMAGE
2007	1	0	0
2008	1	1	100
2009	3	0	0
2010	2	1	50
2011	0	0	0
2012	1	1	100
TOTALS	8	3	37.5

*NOTE : 3 DAMAGING STRIKES ALL OCCURRED AT TAKE-OFF ; 2 (2008 AND 2010-IDENTIFIED BY DNA)



DAMAGE TO AIRCRAFT

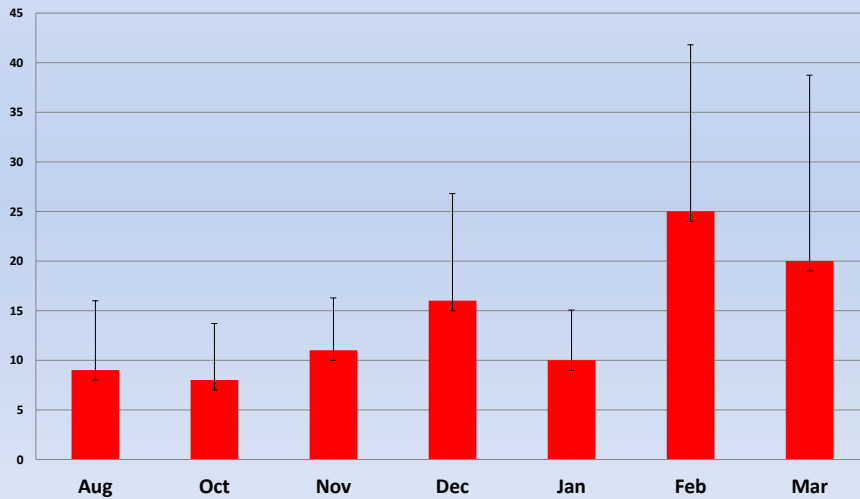


ENGINE INGESTION + DAMAGE TO WING OF A320 ON AUGUST 15TH 2010 DURING TAKE-OFF (DNA ID)



Number of Curlew (Median \pm 95%CI) counted per day in each month 2008 to 2012

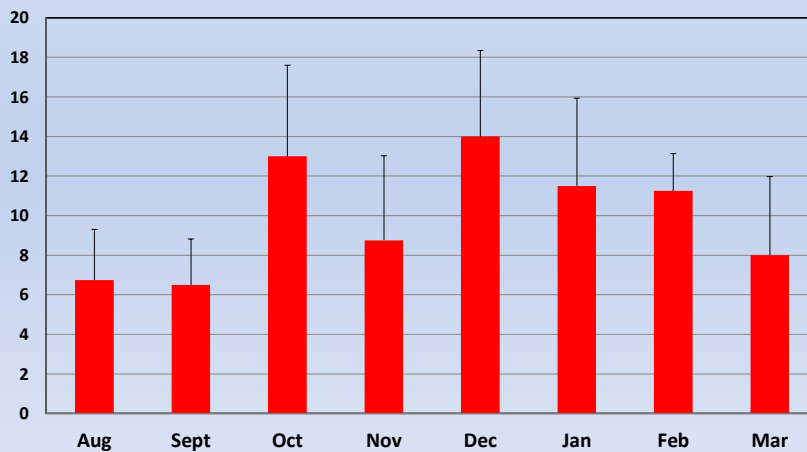
(Note-Zero counts omitted, and too few counts in September to display)



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AVERAGE (\pm SE) NUMBER OF DAYS IN EACH MONTH CURLEW DETECTED AT AIRFIELD 2008 TO 2012

Mean (\pm SE) number of days that Curlew were detected at the airfield 2008-2012 (Data from Bird Scaring Log D-AP)



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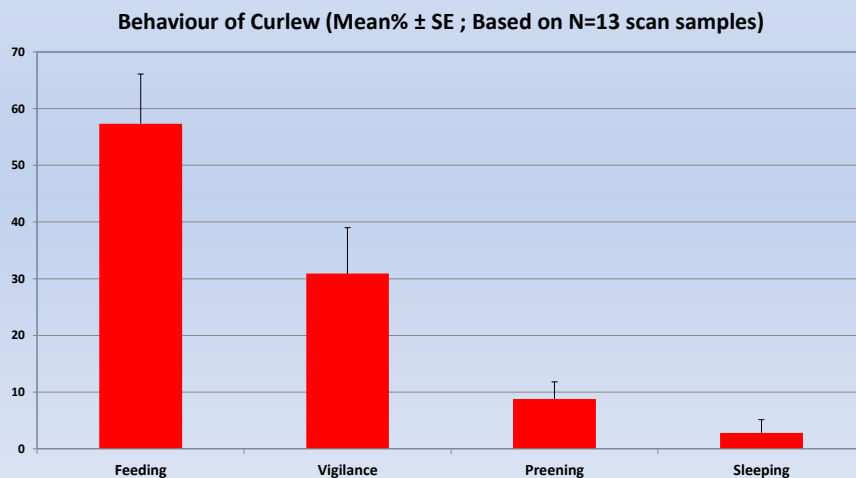
CURLEW PHENOLOGY

- Arrive back on airfield August – though birds may over-fly from June onwards
- None in August in 2008 – not until October 24TH (bird scaring log)
- Most 3RD week of August, but recently in the 1ST week of August
- Remain until March 25TH (2010) but March 9TH 2012



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BEHAVIOUR OF CURLEW AT DUBLIN AIRPORT



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CURLEW BEHAVIOUR

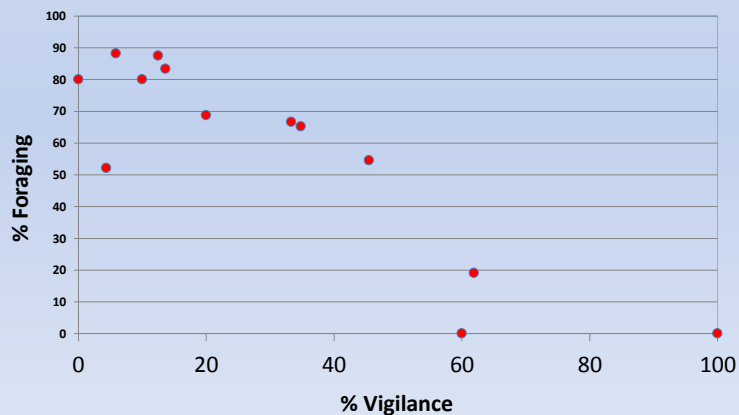
- It is clear that the majority of curlew are feeding on the grasslands
- The long-grasslands habitat is not a deterrent
- Aircraft do not scare the curlew
- Comfort behaviours (preening and sleeping = > 10 but <20% of all behaviours)

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FEEDING AND VIGILANCE OF CURLEW

Feeding and vigilance are inversely correlated



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STARLINGS JOIN THE CURLEW



PHOTO : MICK MACKEY –
NOT TAKEN AT DUBLIN
AIRPORT !!

STARLINGS

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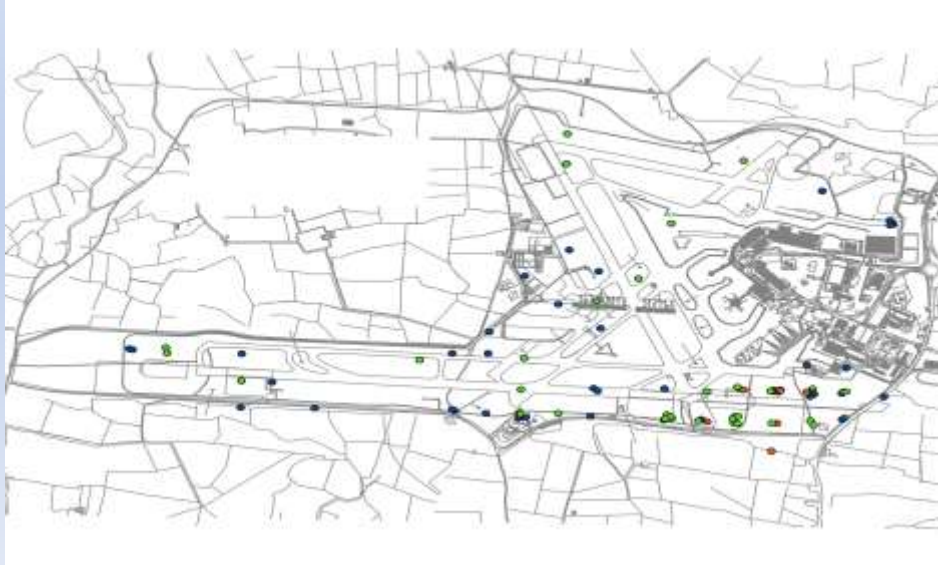
THE ARRIVAL OF THE STARLING

- As curlew flocks became more frequent – starling flocks began to join them in the long grass
- Thus increasing the hazard to aviation
- Starlings present in most months but in small flocks around periphery – mostly after grass cutting
- Now in the area of the flight strip with the curlew
- 1ST multiple starling strike (4 birds) – in October 2011 – since 1990

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CURLEW AND STARLING DISTRIBUTION



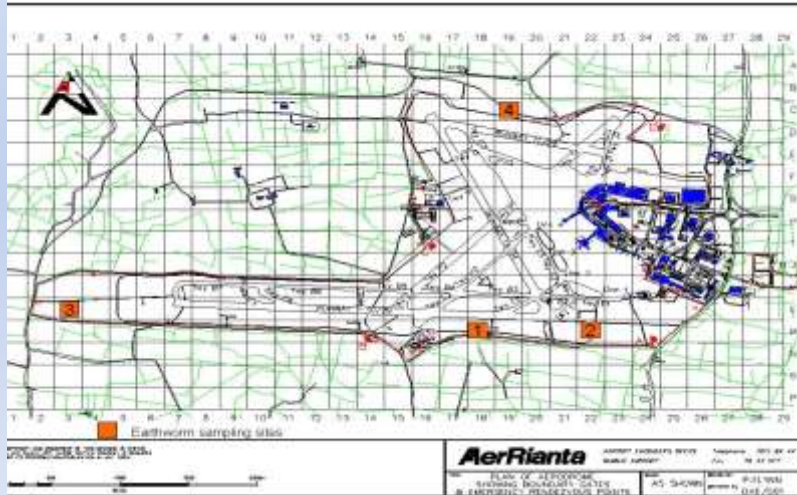
WHAT IS THE PREY OF GRASSLAND FEEDING CURLEW (AND STARLING)?

- Earthworms (Annelida; Oligochaeta; Lumbricidae) main prey of field feeding curlew (e.g. Townshend, 1981)
- Leatherjackets (Insecta; Diptera; Tipulidae) - main prey of starling (e.g. Feare, 1984)
- 10cm³ *20; N per m²
- No tipulid larvae or foliar inverts
- All earthworm and a few beetle larvae

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SURVEY OF SOIL INVERTS –CURLEW AND STARLING PREY



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ABUNDANCE (PER M² TO A DEPTH OF 10CM) AND DIVERSITY OF EARTHWORMS (LUMBRICIDAE) AT DUBLIN AIRPORT

	Site 1		Site 2		Site 3		Site 4	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total Abundance per m²	435	143.2	340	133.0	360	152.7	310	151.7
Species								
<i>Allolobophora chlorotica</i>	3	2.8	3	4.5	0	0.5	0	0.0
<i>Aporrectodea rosea</i>	2	1.3	0	0.4	3	1.5	3	2.2
<i>Aporrectodea caliginosa</i>	2	2.6	1	0.8	4	1.6	2	3.4
<i>Aporrectodea longa</i>	1	1.0	1	1.1	0	0.0	0	0.0
<i>Murchieona minuscula</i>	0	0.4	0	0.4	0	0.0	0	0.0
<i>Satchellius mammalis</i>	0	0.0	0	0.0	1	1.1	0	0.9
<i>Dendrobaena octaedra</i>	1	0.5	0	0.4	0	0.0	0	0.0
<i>Epilobic juveniles/sub adults</i>	4	4.0	3	1.8	1	2.2	2	2.7
<i>Lumbricus festivus</i>	0	0.0	0	0.0	0	0.9	0	0.0
<i>Lumbricus rubellus</i>	1	1.3	1	1.0	2	1.9	2	1.8
<i>Lumbricus castaneus</i>	1	2.2	3	1.1	0	0.4	0	0.0
<i>Tanylobic juveniles/sub adults</i>	2	2.1	2	1.1	2	1.5	2	1.9
<i>Megascolecidae</i>	1	0.9	0	0.0	0	0.0	0	0.0
No. of species per site	5	0.5	4	0.5	5	1.5	2	0.5

FUNCTIONAL GROUPS OF EARTHWORMS AT AIRFIELD

<u>Functional groups as % of total abundance per m2</u>	<u>Site 1</u>	<u>Site 2</u>	<u>Site 3</u>	<u>Site 4</u>
Epigeic (largely surface feeders)	18	28	29	23
Endogeic (within soil feeders)	39	31	50	42
Anecic (deep borrowing, surface feeding)	6	10	0	0

Proportional distribution of functional groups in the population, given as % of epigeic*/endogeic**/anecic*** earthworms at each site

*Epigeic species (largely surface feeders) include *Satchellius mammalis*, *Dendrobaena octaedra*, *Lumbricus festivus*, *Lumbricus rubellus*, and *Lumbricus castaneus*.

** Endogeic species (those that live and feed within the upper soil layer) include *Allolobophora chlorotica*, *Aporrectodea rosea*, *Aporrectodea caliginosa*, and *Murchieona minuscula*.

***Anecic species (those which make permanent burrows deeper into the soil), include *Lumbricus terrestris* and *Aporrectodea longa*.

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PROBABLE PREY

- Earthworm numbers high
- Especially endogeic species
- But epigeic also abundant and probably are the prey of starlings
- Foliar inverts very few and leatherjackets absent
- But earthworm distribution looks relatively uniform – so starlings not using curlew to identify food concentrations
- Using curlew as “early warning” of predators? Thus allowing them to exploit the long grass
- Mimic curlew call but no previous mention in the literature of such marked association

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MANAGING CURLEW

- Curlew is a quarry species in Ireland (not GB) with short open season
- Curlew is an annex 2 species (EU 2007)
- Breeding population has almost completely disappeared from Ireland over the past decade (decrease of 95%)
- Optimally foraging at the airfield – much more feeding than vigilance
- Control should aim to reverse this

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CONTROLS

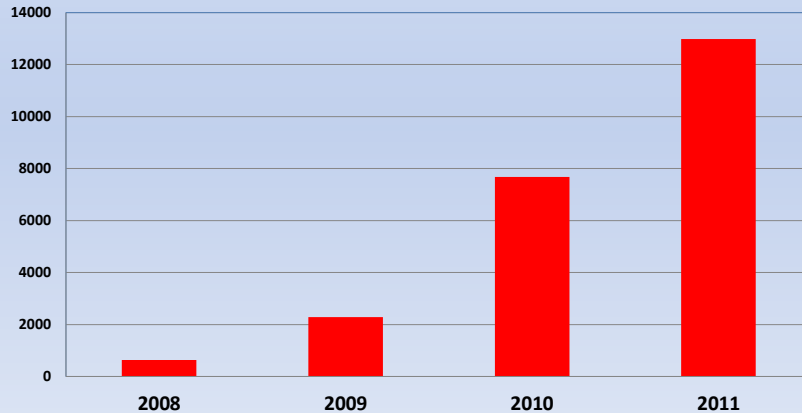
- General insecticide sprayed in late autumn of 2010
- Brief respite in terms of curlew and starling numbers
- But entered non-sprayed areas
- Intense scaring using shell crackers
- Two teams working together
- Starling and curlew very difficult to frighten off

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SCARING (HAZING) ACTIONS AGAINST CURLEW AUG TO DEC 2008 TO 2011

Scaring Actions (August to December interval only) 2008 to 2011



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WHY HAS THE PROBLEM ARISEN?

- Land take during Celtic Tiger
- Decline in “natural” prey species in estuarine habitat
- Field-feeding of males well known but poorly understood
- Tides?
- Lumbricides used up to 2006-2007 now banned (EU regulations)
- Change in traffic-use of the airfield
- Starlings becoming more numerous – more murmurations being seen of late

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NORTH COUNTY DUBLIN



STARLING MURMURATION



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CONCLUSION

- **Recent arrival of curlew – a species not deterred by long grass**
- **Starling exploits presence of curlew = double hazard**
- **Lumbricides available in past now banned**
- **Experiments in progress with new generation of lumbricides**

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