



# Maximising the Biodiversity Impacts of REPS

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This is a joint BirdWatch Ireland/UCC project, funded by the Department of Agriculture and Food (under the Research Stimulus Fund of the National Development Plan) and by The Heritage Council.



# Project Objectives

- **Investigate current biodiversity impacts of REPS (using birds as indicators)**
- **Research links between bird species and farmland habitats in summer and winter**
- **Develop management prescriptions beneficial for birds, for incorporation into future agri-environment measures**

# Methods: Site Selection I

- **Each site is one continuous farm unit**
- **Minimum size of 10 hectares**
  - **No forestry**
  - **No commonage**
  - **No designated land**
- **No organic/conversion farms**
- **REPS farms: in scheme at least one year**
- **Non-REPS farms: never in scheme**

# Methods: Site Selection II

- **To control for external effects (soil, climate, farming enterprise and intensity), all sites paired REPS/ non-REPS. These pairs are based on:**
  - **Farm enterprise**
  - **Farm size**
  - **Location**

# Methods: Habitats

- **Divide farm in to habitat ‘patches’**
  - A patch is a continuous habitat block (e.g. field, farmyard, etc.)
- **Identify boundary units**
  - Boundary units are continuous habitats between intersections
  - Each boundary may consist of several habitat features (hedge, wall, ditch, etc.)
- **Record data on each habitat unit:**
  - Patch Interiors (area & habitat)
  - Boundaries (length, width, height & habitat)

# Methods: Birds

- **Fieldwork carried out twice annually**
- **Two visits per farm per season**
  - **Start at dawn**
  - **Maximum of four hours per visit**
- **All boundaries are walked and (for large/dense patches) interior transects**
- **Location of all birds recorded on maps**
- **All bird records assigned to habitats**

# Results: Farm Numbers

**Table 1: Number of farms surveyed during winter fieldwork**

<b>Region</b>	<b>North-west</b>			<b>Midlands</b>			<b>South-east</b>			<b>All Regions</b>		
<b>Season</b>	<b>03-04</b>	<b>04-05</b>	<b>Total</b>	<b>03-04</b>	<b>04-05</b>	<b>Total</b>	<b>03-04</b>	<b>04-05</b>	<b>Total</b>	<b>03-04</b>	<b>04-05</b>	<b>Total</b>
REPS	6	8	14	7	7	14	7	6	13	20	21	41
Non-REPS	6	8	14	7	7	14	7	6	13	20	21	41
Total	12	16	28	14	14	28	14	12	26	40	42	82

- **Total of 82 farms surveyed during the two winters:**
  - **40 farms in winter 03-04**
  - **42 farms in winter 04-05**
- **All REPS farmed paired, hence ratio of 1:1, REPS:non-REPS**

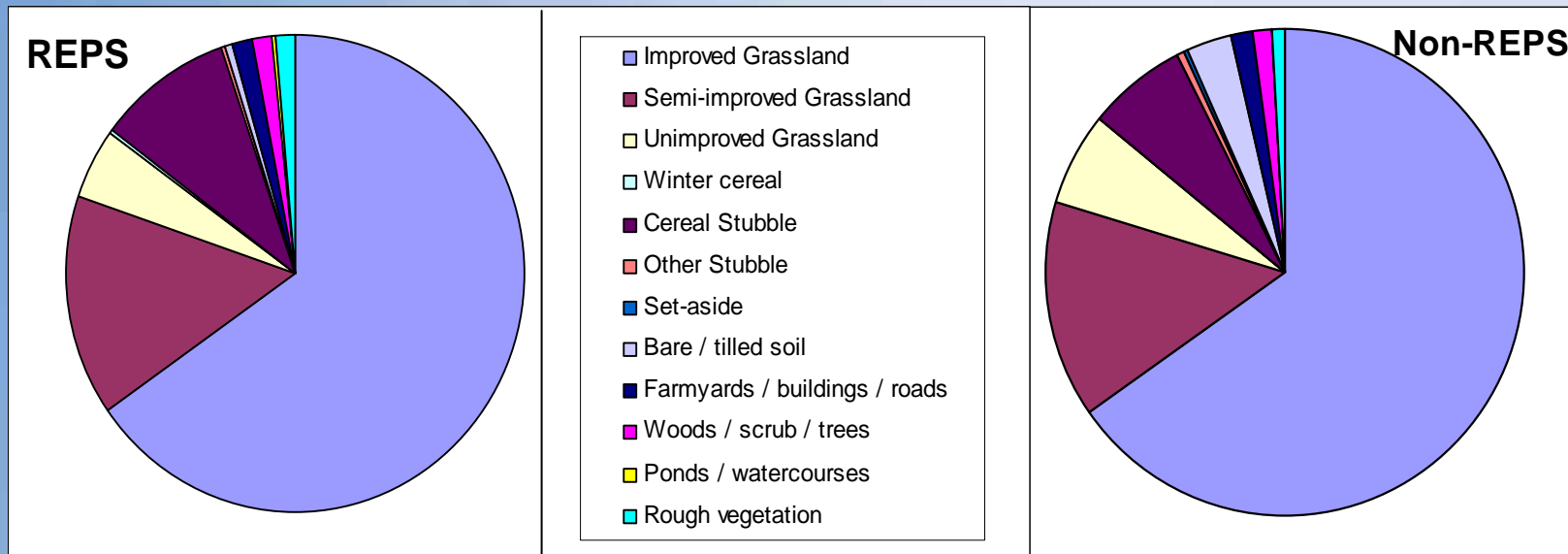
# Results: Survey area

**Table 2: Area of land surveyed (ha) during winter fieldwork**

Region	North-west			Midlands			South-east			All Regions			
	Year	03-04	04-05	Total	03-04	04-05	Total	03-04	04-05	Total	03-04	04-05	Total
<b>REPS</b>		163.68	155.88	319.56	176.75	224.45	401.20	216.18	183.07	399.25	556.61	563.40	1,120.01
<b>Non-REPS</b>		150.47	136.22	286.69	200.03	203.03	403.06	199.80	168.70	368.50	550.30	507.95	1,058.25
<b>Total</b>		314.15	292.10	606.25	376.78	427.48	804.26	415.98	351.77	767.75	1,106.91	1,071.35	2,178.26

- **Total of 2,178.26 hectares surveyed on all farms during winter:**
  - 1,120.01ha on REPS farms
  - 1,058.25ha on non-REPS farms
- **Large difference in areas surveyed between regions:**
  - 606.25ha in North-west (28 farms)
  - 804.26ha in Midlands (28 farms)
  - 767.75ha in South-east (26 farms)

# Results: Interior habitat composition



65.22	Improved Grassland	65.31
15.06	Semi-improved Grassland	14.55
4.83	Unimproved Grassland	5.84
0.27	Winter cereal	0
9.34	Cereal Stubble	6.81
0.29	Other Stubble	0.49
0	Set-aside	0.25
0.63	Bare / tilled soil	3.08
1.21	Farmyards / buildings / roads	1.39
1.58	Woods / scrub / trees	1.54
0.07	Ponds / watercourses	0.03
1.5	Rough vegetation	0.71

# Results: Boundary lengths

Table 4: Length (m) of boundary habitats surveyed during winter fieldwork

Region	North-west			Midlands			South-east			All Regions		
Season	03-04	04-05	Total	03-04	04-05	Total	03-04	04-05	Total	03-04	04-05	Total
REPS	42,050	40,060	82,110	38,625	46,225	84,880	43,110	35,155	78,265	123,785	121,440	245,225
Non-REPS	26,010	36,530	62,540	39,175	38,560	77,735	39,235	37,005	76,240	104,420	112,095	216,515
Total	68,060	76590	144,650	77,800	84,785	162,615	82,345	72,160	154,505	228205	233,535	461,740

- **Total of 461,740m of boundary surveyed on all farms in winter:**
  - 245,225m on REPS farms (53.1% of total)
  - 216,515m on non-REPS farms (46.9% of total)
- **Small differences between regions:**
  - As expected, the smaller farms in the North-west also have smaller fields.

# Results: Boundary lengths

**Table 5: Density of Boundary Habitat features (m/ha) of boundaries surveyed**

REPS	Habitat Type	Non-REPS
174.0	Hedgerow	155.5
17.3	Road / track	20.2
3.9	Bare soil	4.5
156.0	Fence	137.1
22.6	Wall	19.2
40.7	Bank	42.8
54.2	Grass (vegetated) strip	41.0
67.6	Drain / watercourse	53.2

- **Note higher densities of hedgerows, grass strips and drains/ watercourses on REPS farms (typically ‘good’ bird habitats)**
- **Also, higher densities of fences on REPS farms (perhaps ‘good’ management)**

# Results: Bird Data

**Table 6: Mean and standard deviation of bird densities (birds/ha)**

Region	North-west			Midlands			South-east			All Regions		
	mean	sd	n	mean	sd	n	mean	sd	n	mean	sd	n
REPS	6.29	2.97	14	6.04	2.41	14	6.36	2.74	13	6.22	2.65	41
Non-REPS	6.53	2.63	14	5.76	2.90	14	6.61	2.15	13	6.29	2.55	41
Total	6.41	2.76	28	5.90	2.62	28	6.48	2.42	26	6.26	2.59	82

- **No difference in densities between REPS and non-REPS farms:**
  - This also applies when interior and boundary habitats are analysed individually
  - Analysis at farm-level scale

# Results: Bird Data

**Table 7: Mean and standard deviation of hedgerow bird densities (birds/100m)**

Region	North-west			Midlands			South-east			All Regions		
	mean	sd	n	mean	sd	n	mean	sd	n	mean	sd	n
REPS	2.00	1.08	14	2.00	0.66	14	2.30	0.68	13	2.10	0.82	41
Non-REPS	2.09	0.83	14	2.39	0.72	14	2.62	0.62	13	2.36	0.75	41
Total	2.05	0.95	28	2.19	0.71	28	2.46	0.66	26	2.23	0.79	82

- **No significant difference between REPS and non-REPS farms:**
  - **Non-REPS hedgerows all have higher densities of birds**
  - **Reason not clear (REPS farms have slightly higher hedgerow densities: could carrying capacity be a factor?) Need further research! Summer data may be different again.**

# **Preliminary Observations**

- **Different farming produces different communities of birds (as expected) – birds therefore a good indicator**
- **There appears to be few differences between REPS and non-REPS farms in terms of habitat composition or bird numbers (at a farm scale).**
- **Some patterns are emerging, with higher densities of certain habitats on REPS boundaries (this may also be important for summer data)**
- **REPS management may have both positive or negative impacts on habitats and biodiversity – need to look at detailed habitat data to determine if this is the case**
- **Need to examine individual bird species or species groups – REPS may benefit some species but not others (some analysis suggests this may be the case)**

# Conclusion

- **Considerable analysis remains to be done:**
  - Effects of management on habitats and birds
  - Species habitat preferences
  - Summer data analysis
  - *(Summer/winter comparison (same, paired sites))*
- **Identify areas for detailed investigation**
- **Circulate results for discussion**
- **Develop practical recommendations for future REPS (REPS4?):**
  - Biodiversity options
  - Supplementary measures

# Acknowledgements

## **Advisory Group Members:**

**John Carty, Catherine Casey, John Finn, Gerry Gunning, Liam Lysaght, John Muldowney, Darid Norriss & Jeremy Wilson**

## **Fieldworkers and Project staff:**

**John Lusby, Mabel Cheung, Jerry Wray, Ivan Lang, Katherine Kelleher, Karen Moore, Brian Caffrey & Maggie Hall**

## **Technical & Administrative Support:**

**Eugene Ryan (Teagasc)**

**BirdWatch Ireland staff Oran O'Sullivan & Triona Franks**

**DAF staff Shane McCarrick, Maurice Condon, Mary Duffy & Mary Cullinane**

## **REPS Advisors and Planners:**

**Christy Byrne, Bernard Doorley, Sean Fallon, Jim Kirwan, Tom Larkin, Bernadette Leahy, P.J. McLoughlin, Majella Moloney, Seamus Nolan, Paddy O'Brien, Jerry O'Riordan, P.J. Phelan, David Tarpey, Tom Turley & Ben Wilkinson**

**All the Farmers involved in the project, our sincerest thanks.**



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