

# Bird Sensitivity Mapping *for wind energy developments in Ireland*

*Development & Implementation of the mapping tool*



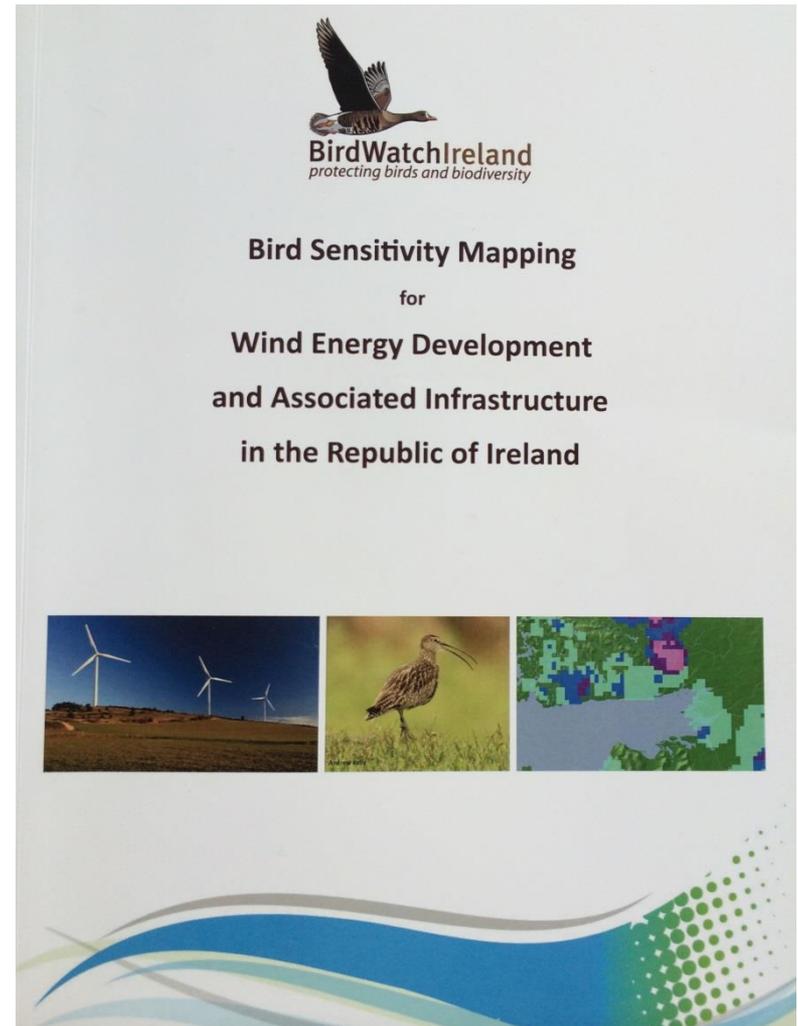
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# Guidance document

- Detailed guidance document  
Requirement for mapping
  - Existing research
  - Detailed methodology
  - Species-level guidance

[http://www.birdwatchireland.ie/portals/0/POLICY/Guidance\\_document.pdf](http://www.birdwatchireland.ie/portals/0/POLICY/Guidance_document.pdf)



# Bird Sensitivity Mapping

*For Wind Energy Developments in Ireland*

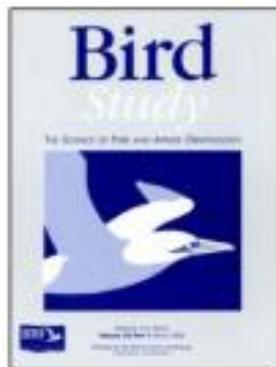
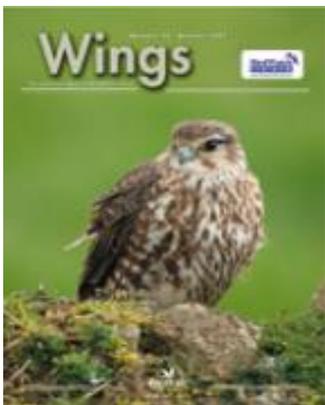
- Our position on Wind Energy
- Development of the mapping tool
- Science behind the map
- Access to information – making the tool available to end-users
- Stakeholder involvement
- Roll out of Training
- Next steps



# BirdWatch Ireland

*Membership supported, science-based*

- > 15,000 members and 28 branches
- Funded by membership subscriptions, donations, grants and sponsorship.
- Active in research and monitoring, practical conservation work, education, policy and advocacy.



## Bird Study

Publication details, including instructions for authors and subscription information:  
<http://www.informaworld.com/supp/title-content=1904369352>

## Population trends of widespread breeding birds in the Republic of Ireland 1998-2008

Olivia Crowe<sup>a</sup>, Richard H. Coombes<sup>b</sup>, Liam Lysaght<sup>c</sup>, Cliona O'Brien<sup>d</sup>, Kingshek Roy Choudhury<sup>e</sup>, Alyn J. Walsh<sup>f</sup>, John H. Wilson<sup>g</sup>, John O'Halloran<sup>h</sup>  
<sup>a</sup> BirdWatch Ireland, Unit 20 Block D, Bullford Business Campus, Kilcoole, Co. Wicklow, Ireland <sup>b</sup> Department of Zoology, Ecology & Plant Science, University College Cork, Cork, Ireland <sup>c</sup> National Biodiversity Data Centre, Beechfield House, Carrigrohane WIT West Campus, County Waterford, Ireland <sup>d</sup> The Heritage Council, Áras na hOidhreachta, Killoenny, Ireland <sup>e</sup> Statistics Department, University College Cork, Cork, Ireland <sup>f</sup> Wexford Wildfowl Reserve, Noerla Slob, Wexford, Ireland <sup>g</sup> National Parks and Wildlife Service, Dublin 2, Ireland



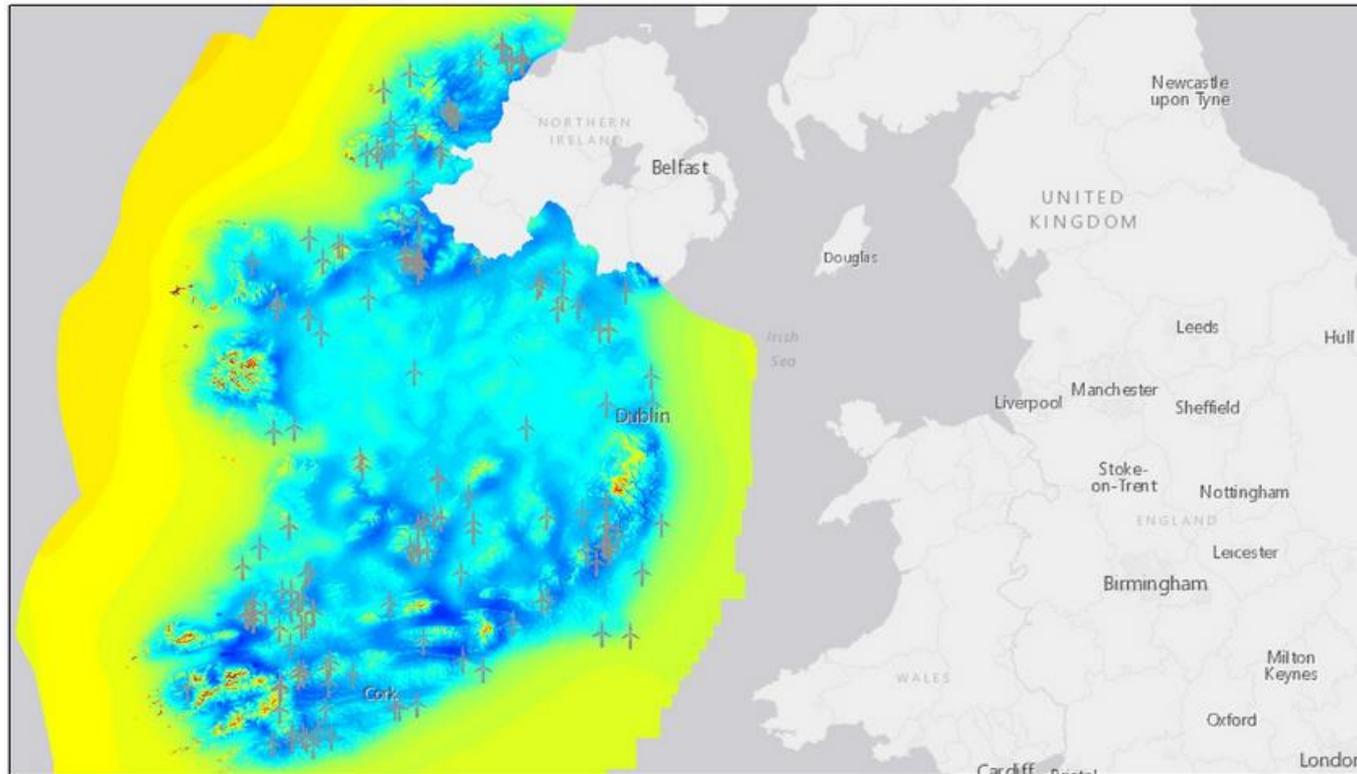
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# Potential for Wind Energy

*In Ireland*

## SEAI Wind Atlas

Wind Mapping System - windspeeds up to 100m



September 25, 2015

 Wind Farms

1:4,622,324  
0 37.5 75 150 mi  
0 62.5 125 250 km  
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



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# In favour of wind energy

## Supporting Ireland's renewable energy targets – Policy & legislative framework

- Climate change – threat to global biodiversity and human well-being.
- Obligations under the European Union's Birds and Habitats Directives. The **Birds and Habitats Directives** form the cornerstones of Europe's legislation on nature conservation.
- *“wildlife sensitivity maps will also help to avoid potential conflicts with the provisions of article 5 of the Birds Directive and 12 & 13 of the Habitats Directive as regards the need to protect species of EU importance throughout their entire natural range within the EU.”*

European Commission's Guidance on Wind Energy Development and Natura 2000 (2011)



# In favour of wind energy

*Ensuring compliance and strengthening protection*

European Court of Justice Case "**The Birds Case**" (C-418/04):

Ireland found guilty of failing to properly transpose and implement obligations of **Birds (2009/147/EC)** and **Habitats (92/43/EEC) Directives** into Irish legislation

Key issue: **Lack of coherent strategy** for protection of "*priority, migratory and dispersed*" bird species in the **wider countryside (i.e. outside of protected areas)**

Led to *Group Species Action Plans for Birds in Ireland 2011* – cross-cutting action ‘need for spatial planning tools such as sensitivity mapping by 2015’



**ACTION PLAN FOR  
UPLAND BIRDS  
IN IRELAND 2011-2020**



**ACTION PLAN FOR  
MARINE AND SEA CLIFF BIRDS  
IN IRELAND 2011-2020**



**ACTION PLAN FOR  
WOODLAND AND SCRUB BIRDS  
IN IRELAND 2011-2020**



**ACTION PLAN FOR  
LAKE, FEN AND TURLOUGH BIRDS  
IN IRELAND 2011-2020**



**ACTION PLAN FOR  
LOWLAND FARMLAND BIRDS  
IN IRELAND 2011-2020**



# What is Sensitivity Mapping?

## *Spatial planning tool*

- A means to achieving our renewable energy targets without adversely impacting on our obligations under the European Union's Nature Directives
- Measured spatial indication of where protected species are likely to be perturbed by change
- Does not create no-go areas
- Not indicative of species presence/absence
- Uses existing data
- Scientific-basis for scoring sensitivity
- Species Experts & other Stakeholder involvement



# Potential impacts of wind energy on birds

- Collision
- Displacement disturbance
- Habitat loss/habitat change
- Barrier effects







# Project development

## **Piloting Sensitivity Mapping for Irish birds**

- Pilot approach for Whooper Swan
- Funded by Irish Environmental Network, 2010

## **Scoping best practice and methodology required for a breeding wader Sensitivity Map**

- Scoping methodology for mapping breeding waders
- Funded by the Heritage Council, 2012

## **Bird Sensitivity Map for Ireland (Phase 1)**

- Methodology determined, three draft layers produced, High Level Stakeholder Group established
- Funded by Sustainable Energy Authority of Ireland, 2012

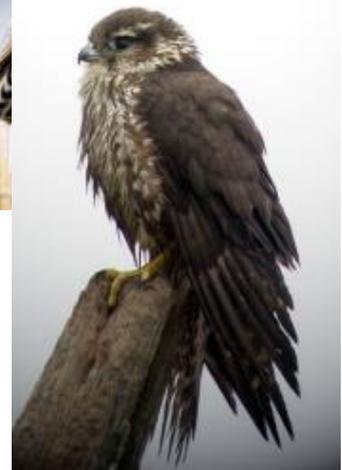
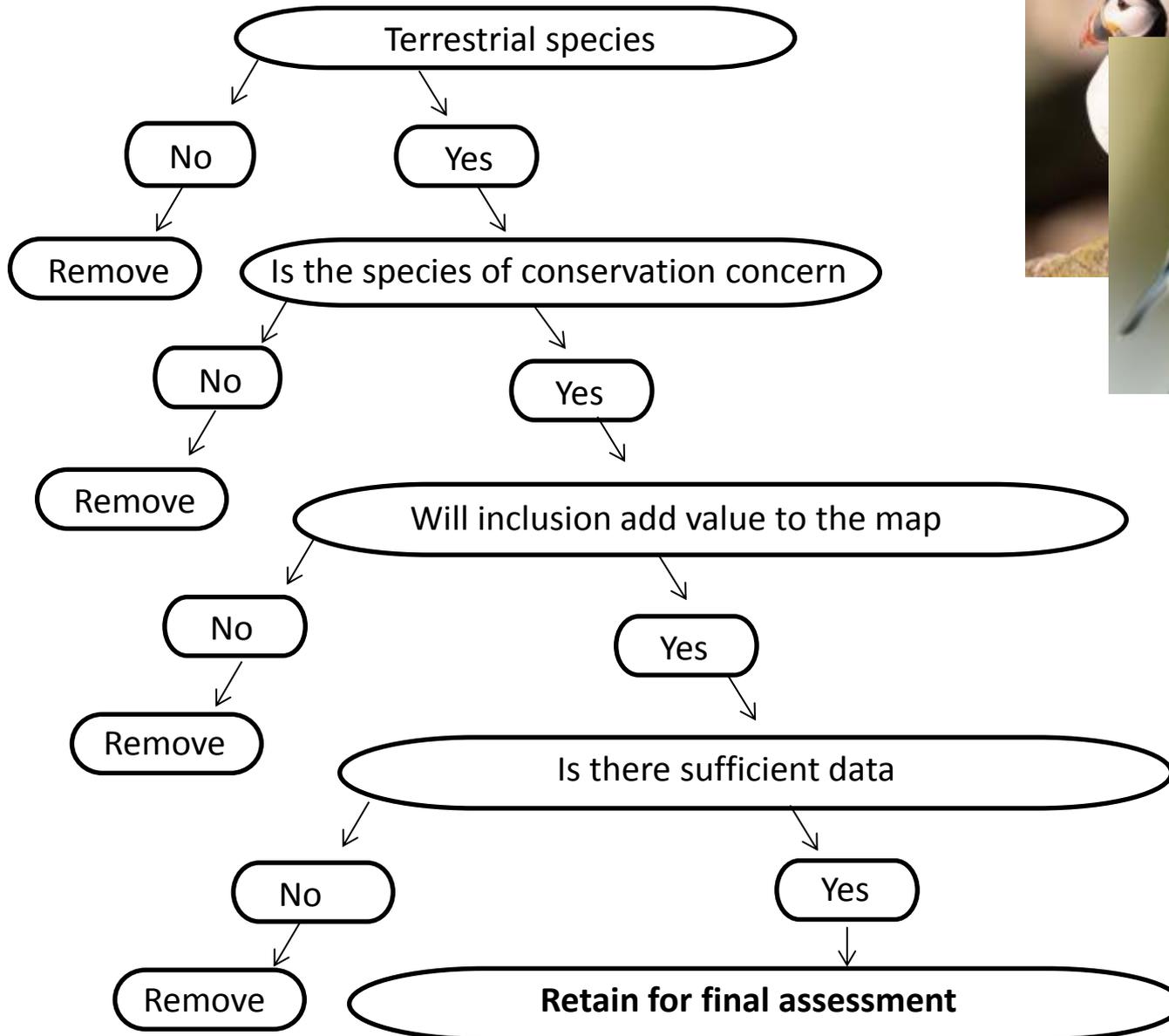
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## **Full Republic of Ireland Sensitivity Map (Phase 2+3)**

- Various funders and collaborators
- Scoping for All-Ireland map



# Species selection



# Calculating the Sensitivity Index

Score	Annex I of the Birds Directive	EU SPEC	BoCCI	Proportion of flyway & BiE2 - (euro breeding/wintering) popn
Score 4	Yes	SPEC 1	Red	>50%
Score 3		SPEC 2		26-50%
Score 2		SPEC 3	Amber	11-25%
Score 1				1-10%
Score 0	No	SPEC 4	Green	<1%

## Conservation Score

## Flight Vulnerability

Species	Adult annual survival rate	Flight Manoeuvrability	Soaring	Predatory / aerial forager	Ranging Behaviour	Flocking	Nocturnal flight activity	Aerial Display
Score 4	>0.85-1.00	Very Low	Always		Very wide range		Act at night	
Score 3	>0.70-0.85	Low	Usually	Highly	Long, daily commuter			
Score 2	>0.60-0.70	Medium	Regularly		Wide	Always	Crepuscular	Frequent
Score 1	>0.50-0.60	High	Sometimes	Partially	Local movements	Sometimes		Occasional
Score 0		Very High	Never	Never	Sedentary	Never	Diurnal	Never

Species	Range in Ireland	Site fidelity	Availability of preferred habitat	Habitat Preference	Sensitivity to displacement
Score 4	Very limited range	High	Low	Open	High
Score 3	Limited range				
Score 2	Localised	Med	Med	Semi-open	Medium
Score 1	Widely distributed				
Score 0	Very widely distributed	Low	High	Closed	Low

## Habitat Vulnerability



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# Calculating the Sensitivity Index

Species Sensitivity Score (SSS) =

Max. Conservation Score

X

Average [Flight Vulnerability Scores]

+

Average [Habitat Vulnerability Scores]

- Characteristics often overlap (i.e. collinear)
- Avoid inflation / stretching of range

# Species List

## Top 30 Species

Golden Eagle	Whooper Swan
Common Scoter	Chough
Red-throated Diver	Hen Harrier
Twite	Curlew (Breeding)
Dunlin (Breeding)	Red Kite
Golden Plover (Breeding)	Merlin
Sandwich Tern	Barn Owl
Bewick's Swan	Light-bellied Brent Goose
Common Tern	Black-headed Gull
White-tailed Eagle	Peregrine Falcon
Barnacle Goose	Common Gull
Greenland White-fronted Goose	Greylag Goose
Lapwing (Breeding)	Red Grouse
Redshank (Breeding)	Lesser Black-backed Gull
Corncrake	Grey Partridge



# Species information

For those 22 mapped species - existing distributional data were used:

- Bird Atlas 2007-11
- I-WeBS – Irish Wetland Bird Survey
- CBS – Countryside
- National Surveys (e.g. Hen Harrier; Red Grouse)

Other sources of data (for example EIAs) were not available.

Data Gaps exist for some species e.g. Merlin



# External consultation

7 factors - more subjective in nature:

## Flight Vulnerability

1. **Flight manoeuvrability**
2. **Soaring/flying at turbine height**
3. **Ranging behaviour**
4. **Aerial display**

## Habitat Vulnerability

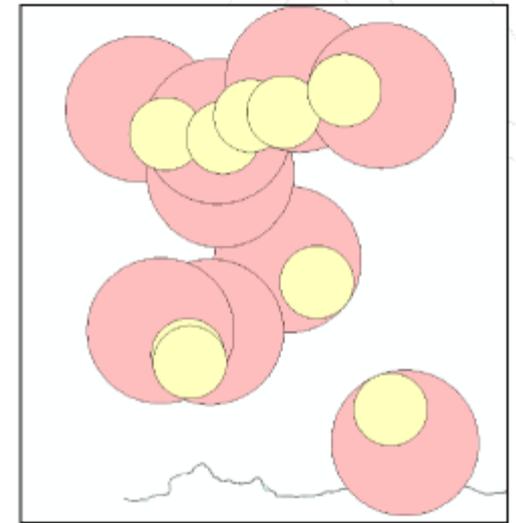
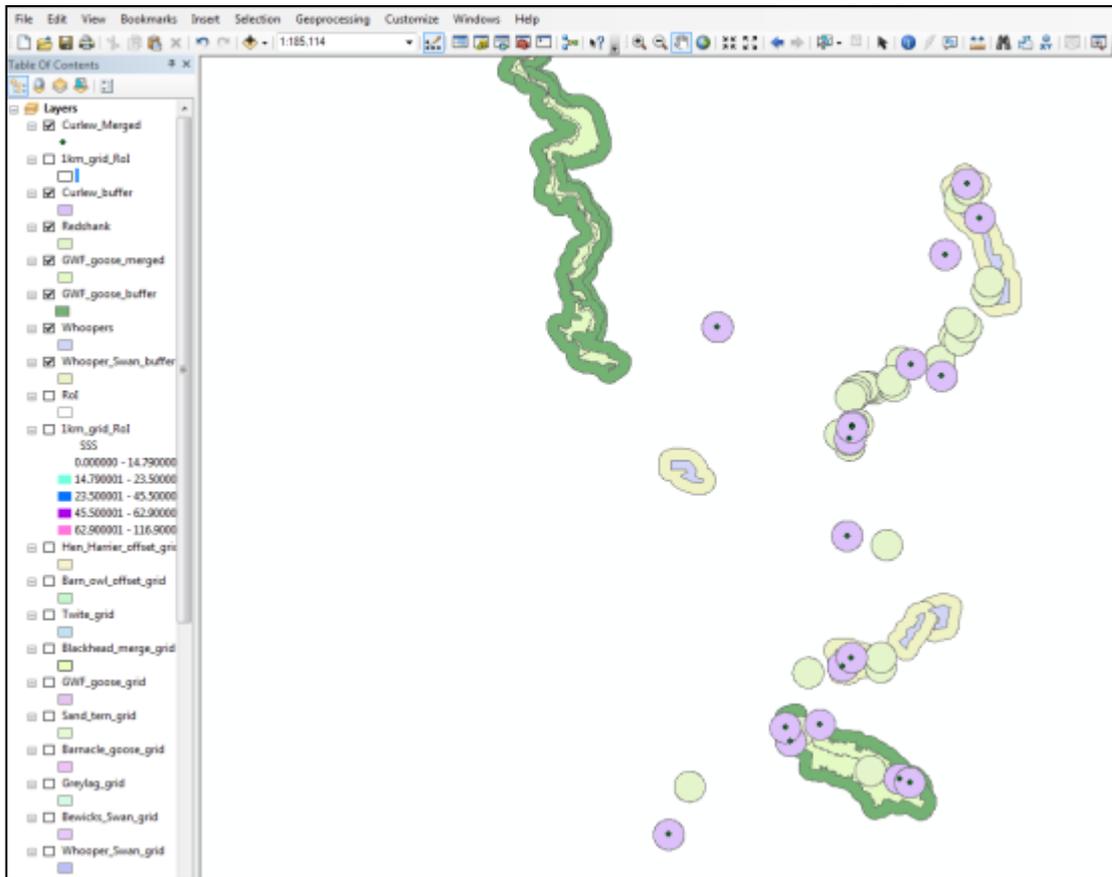
1. **Site fidelity**
2. **Availability of preferred habitat**
3. **Sensitivity to disturbance/displacement**



# Zones of sensitivity

- Internal + external consultation and consensus
- Individual radius distance for each

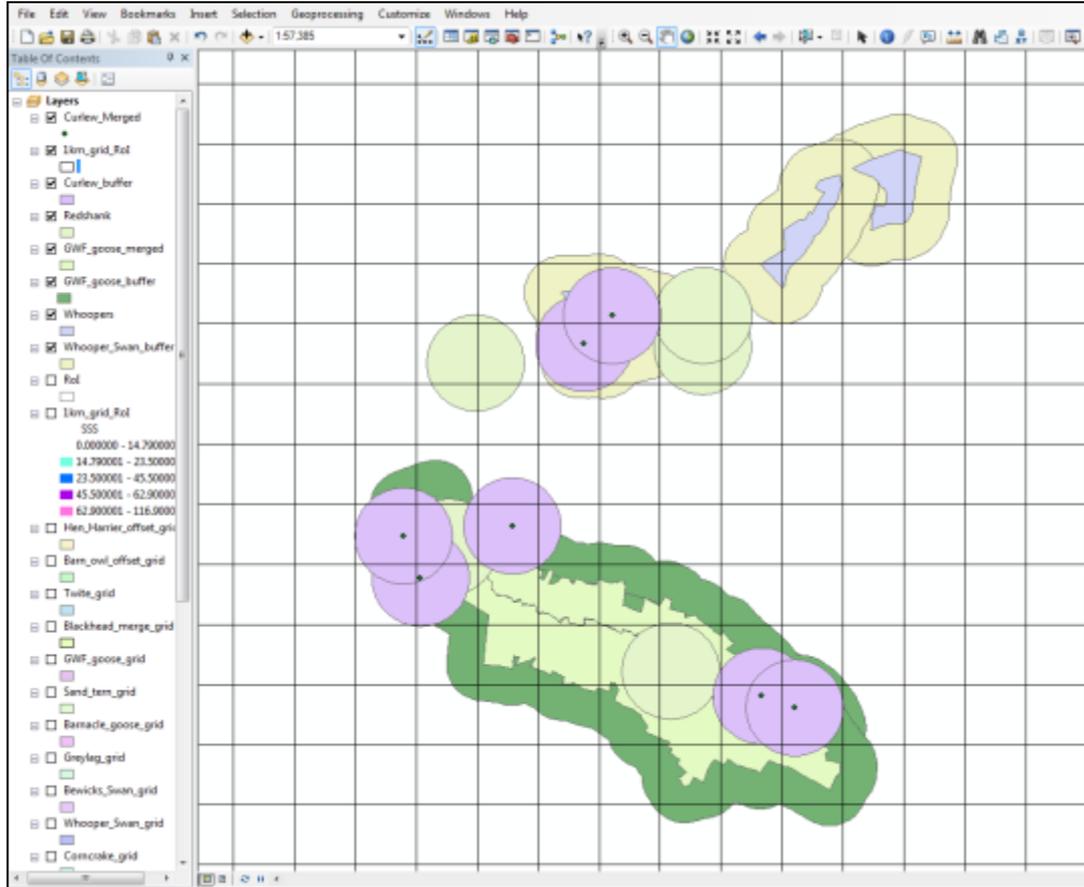
Raptors: Random offset



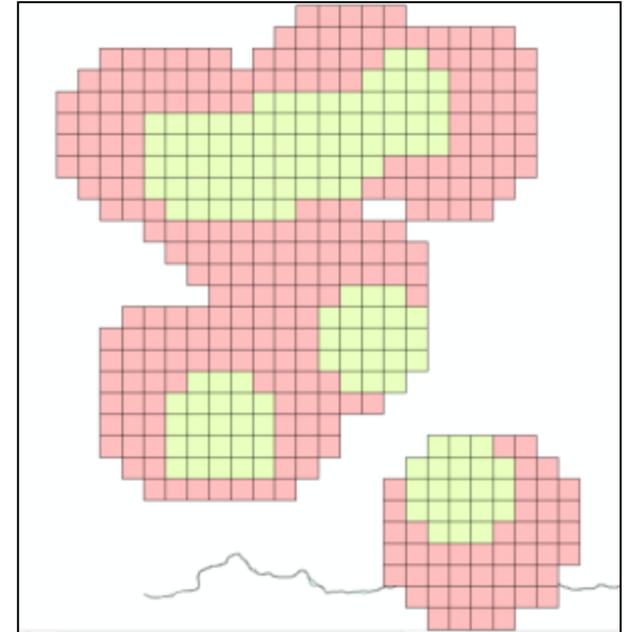
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# Sensitivity Mapping

Overlaid with 1km grid

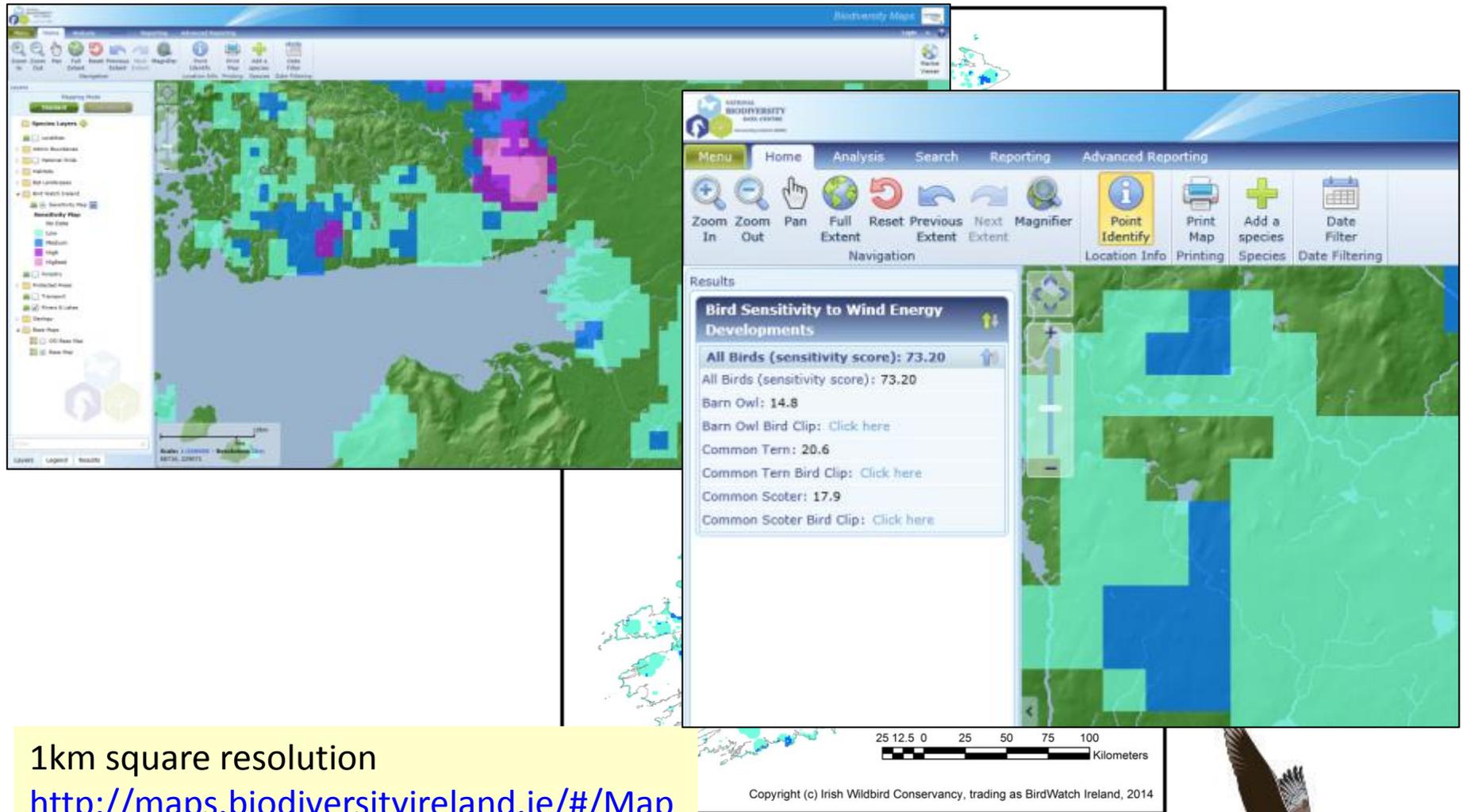


Raptors



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# Online Mapping Tool



1km square resolution

<http://maps.biodiversityireland.ie/#/Map>

Graduated colour scheme used according to Species Sensitivity and Species Richness



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# Sensitivity Mapping

## Greylag Goose *Anser anser*



**Conservation Status in Ireland:** Amber listed

**BirdWatch Ireland Species Sensitivity Score:** 19.0

**Vulnerability attributes/assessment:** Sensitive to habitat loss

**References/metadata:** Irish Wetland Bird Survey (I-WeBS)

**Status in Europe:** Secure

**Typical Lifespan:** 8 years

**Diet:** Roots of rushes and sedges, though increasingly cereal stubble, potatoes and grassland

**Habitat:** Reedbeds and marshes of estuaries and lakes, low-lying wetlands and grasslands

**For further information click below**

[Greylag Goose Species Guidance \(300KB pdf\)](#)

[Guidance Document - Bird Sensitivity Mapping for Wind Energy Developments \(3MB pdf\)](#)



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# The mapping tool

<http://maps.biodiversityireland.ie/#/Home>

Potentially prompted to  
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**Welcome**  
National Biodiversity Data Centre Mapping System

Biodiversity Maps provides access to high quality information on Ireland's biological diversity. Use the system to find out what is known about the different species that occur in Ireland, where our protected and threatened species occur, and who is recording biodiversity. Also, find out what is known about the biodiversity of your locality.

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**Species Search**  
Search for a species in the mapping system

Species Name

Search Using  
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**Species Designation Browser**  
Browse the database by species designation lists

- 
- 
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**Browse the Database**  
Select an option below to browse the mapping system database

- 
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**Statistics Results**  
View the current status of the mapping system database below

Species records: 3,108,953  
Species: 14,309  
Data Sets: 104  
Last updated: 24 November 2014



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# Bird Sensitivity Mapping Tool

## *Access to information*

- Information at an **early stage of the planning process**
- A tool for **national planning authorities** to assist their strategic planning
- Contributes useful overview information to **EIAs** to complement data collection for specific sites
- Provides **agencies** with a tool to assist them in ensuring adequate environmental safeguards for renewable energy projects they fund



# Overview

## *Achieving buy-in*

- Engagement with Stakeholders & Building their confidence in the Approach
- Availability of Tool
- Publicising tool & Guidance
- Mobilisation of Tool
  - Training
  - Integration



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# Overview

## *Mapping tool development & roll out*

- Other available resources

e.g.

- **Wind Atlas**

- <http://maps.seai.ie/wind/>

- **EPA Maps**

- <http://gis.epa.ie/>

- Planning & Statutory agencies

- Challenges & the Future



# Stakeholders

BirdLife International

BirdWatch Ireland

Bord Gais

Bord na Mona

Coillte

Dept. Communications, Energy & Natural  
Resources

Dublin Institute of Technology

Ecotricity

EirGrid

Electricity Supply Board

Environmental Protection Agency

Heritage Council

Irish Planning Institute

Irish Wind Energy Association

National Biodiversity Data Centre

National Parks and Wildlife Centre

Royal Society for the Protection of Birds

RPS Group

SSE Renewables

Sustainable Energy Authority of Ireland



# Stakeholders

## Getting buy-in

### Phases 1-3

- pilot phase & subsequent phases
- Participatory process
- Stakeholder meetings & workshops
- Involved at every stage in planning, mapping elements and producing guidance
- Funders
- Guidance
  - Species
  - Tool itself & caveats



# The mapping tool

Publically available to view & download

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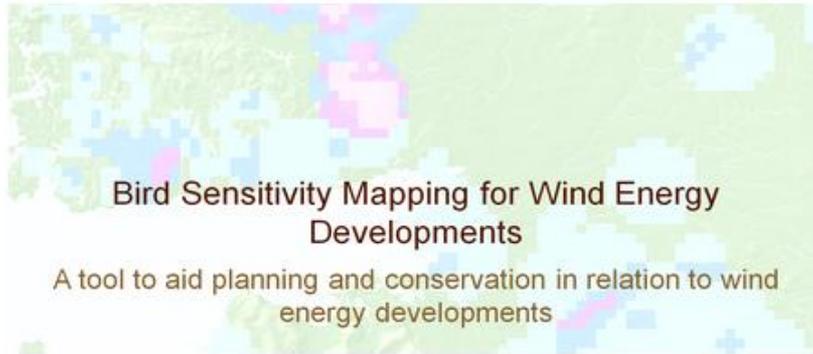


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Our Work » Policy & Advocacy - an overview » Bird Sensitivity Mapping      Friday, September 25, 2015

**Roseate Tern**  
Perhaps the most graceful of our breeding terns, they are confined to just a few east coast colonies



**Bird Sensitivity Mapping for Wind Energy Developments**

A tool to aid planning and conservation in relation to wind energy developments

View Map



N.B. Users will need to use Mozilla Firefox or Internet Explorer web browsers to use the online mapping tool available on the NBDC website.

Downloads

[Guidance Document](#)

[Executive Summary](#)

[Layer Package \(ITM\)](#)

**Important:**

- This mapping tool does not create no-go areas for energy infrastructure
- This tool does not include all vulnerable species due to data and other issues
- The tool does not replace SEA, AA or EIA requirements nor the need to tailor survey and research to specific sites, projects or plans
- This tool is for use early in screening, planning or assessment processes only
- This tool should not inform new or existing nature conservation designations
- The Bird Sensitivity to Wind Energy project is based on the collation of existing distributional data. No new distributional data were gathered through this process



Black-tailed Godwits in flight (Photo: Oran O'Sullivan). It may not only be collision that affects bird populations. Disturbance displacement, habitat loss and barrier effects have been shown to impact bird populations just as much as collision mortality.

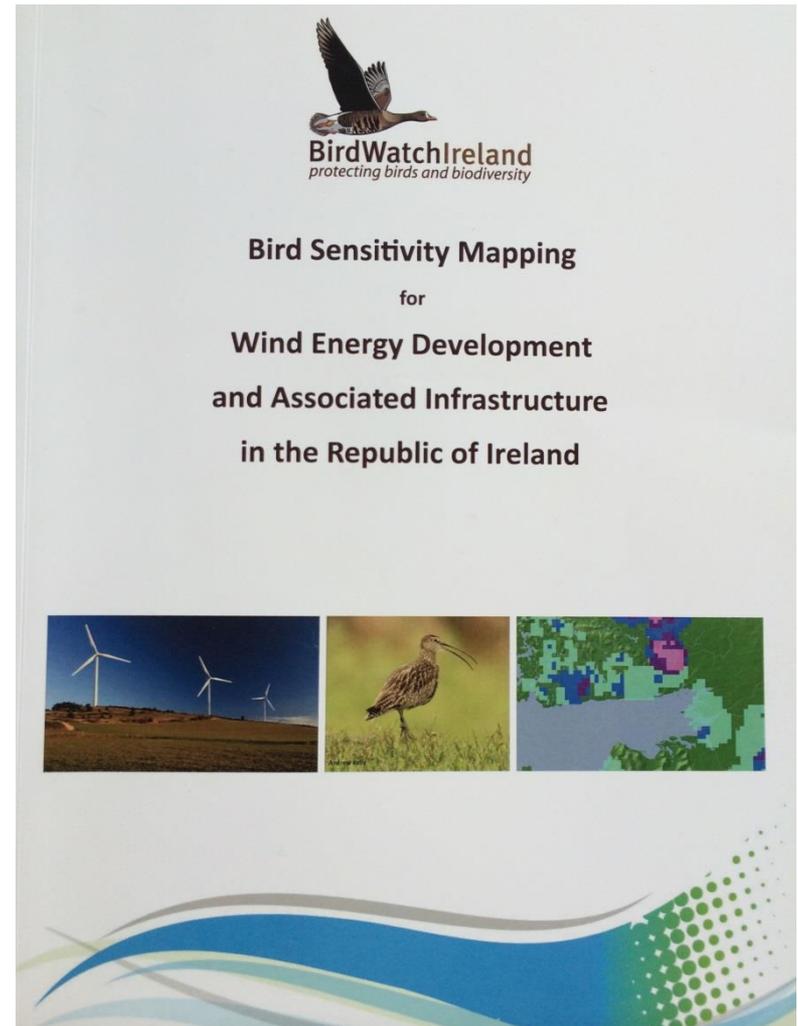


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# Wider Awareness Raising

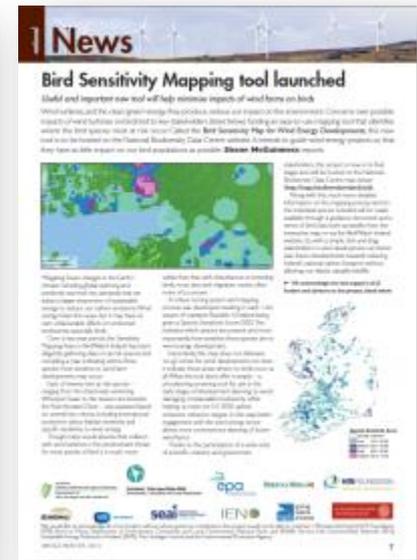
## MEDIA COVERAGE

- Wings Magazine
- Energy Ireland: Renewables

## National Media (TV & Print)

- RTÉ **EcoEye** Irish TV Programme – February 2015 - see <https://youtu.be/svzDvqoYEWU>
- Irish Times articles (27/02/2015) (11/05/2015)

Official Launch of Tool - March 2015



# Wider Awareness Raising

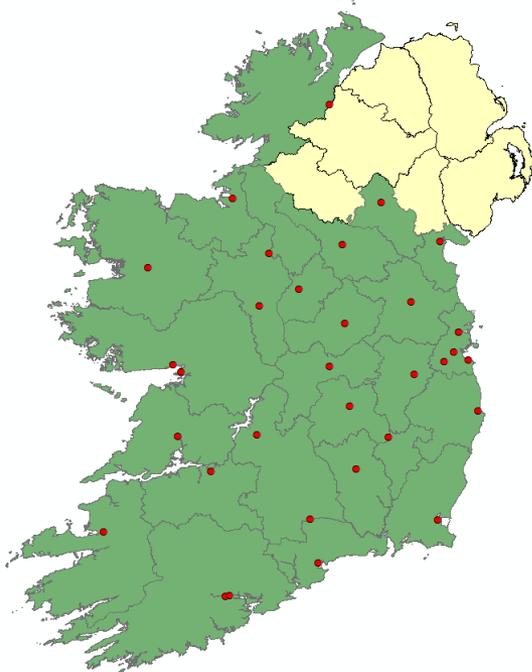
## CONFERENCES & SUBMISSIONS

- *BirdLife International Workshop – Wildlife Spatial Planning*, Cambridge, UK, Sept 2015.
- IEA Task 34, WREN, webinar – August 2015
- *Conference on Wind Energy and Wildlife Impacts* – Berlin, March 2015
- *Planning for Energy Infrastructure* – October 2014
- *Green Paper - Priority 3 'Planning and Implementing Essential Energy Infrastructure'* – October 2014
- *Green Paper - Priority 5: "Putting the Energy System on a Sustainable Pathway"* – November 2014

# Mobilisation of the tool

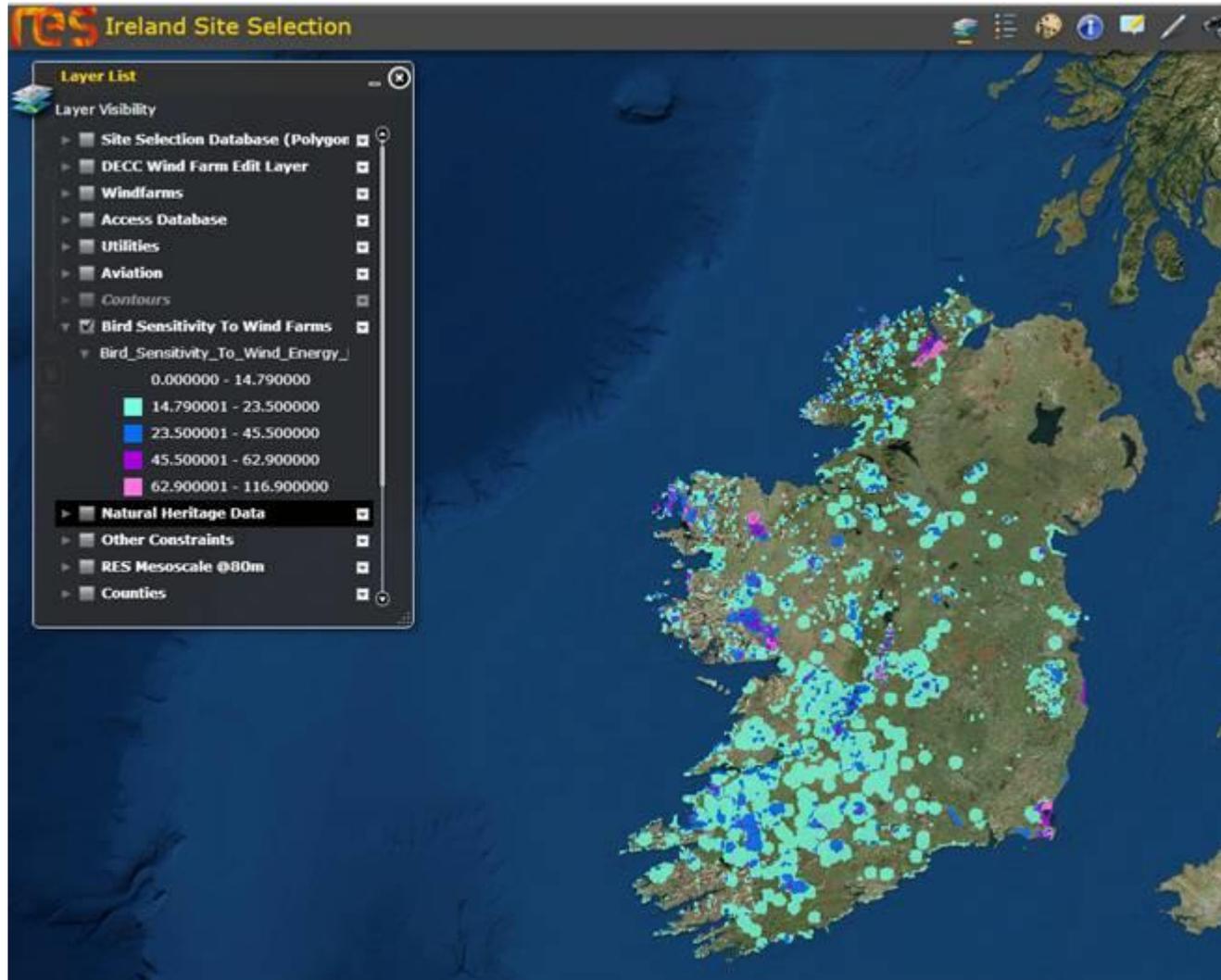
## *Training initiative*

- 27 / 31 Local Authorities + DECLG
- 10 workshops
- 100 participants
- All 26 counties

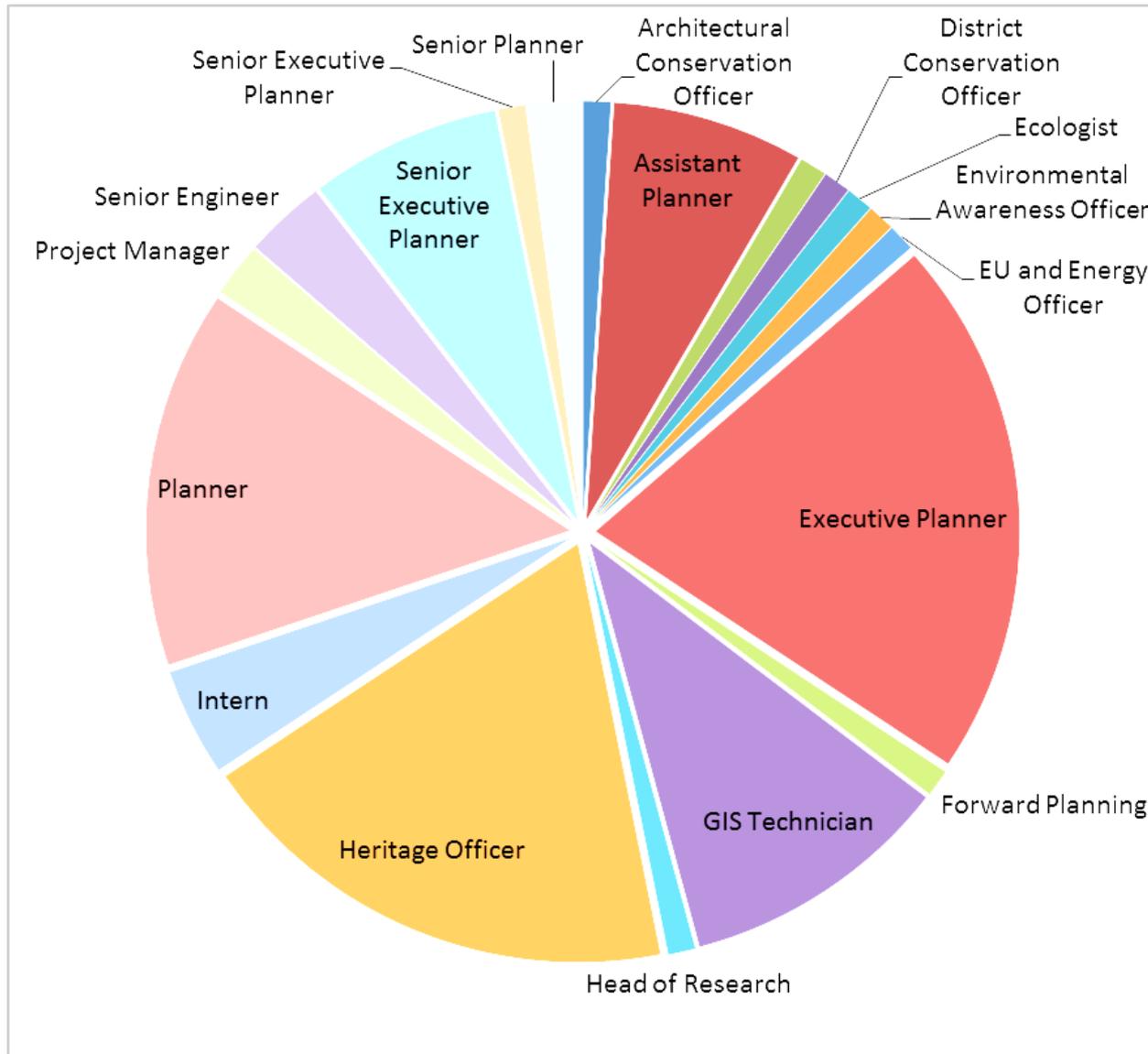




# Industry

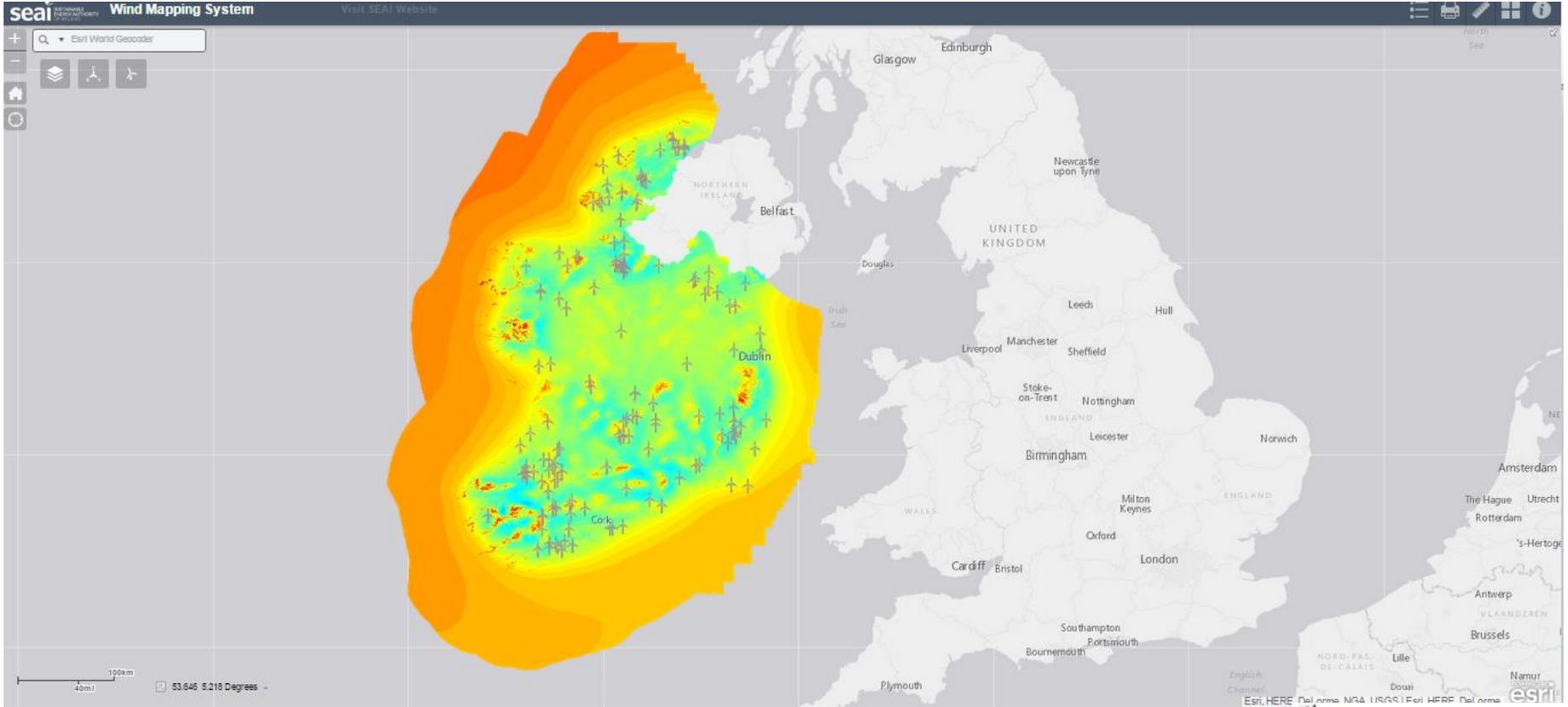


# Mobilisation of the tool



# Other Resources

## SEAI Wind Atlas



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# Mapping tool

*The future – updates & next steps*

- Tool is designed so that it can be updated
- Depend on availability and timing of new datasets & research
- Depend on funding to support update process



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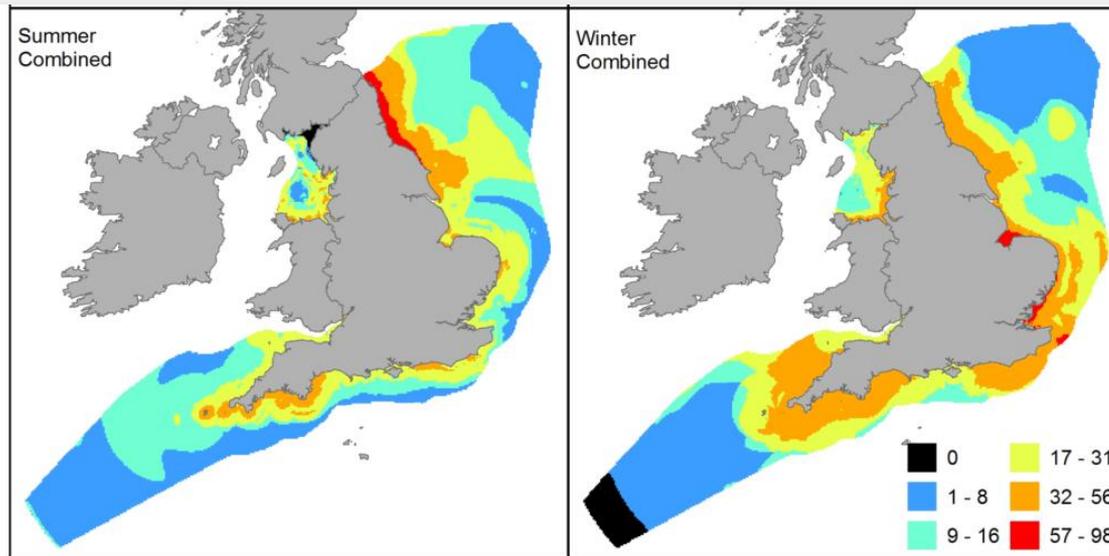
# Mapping Tool

Integration into Planning & Statutory agencies

- Incorporated into Local Development Plans
- Local Wind Strategies
- Engage with Planning Authority - An Bórd Pleanála

# Future – next steps

## Example- Mapping Seabirds Sensitivity to Offshore Windfarms in English territorial waters



**Figure 6. Wind farm sensitivity maps from SeaMaST.** The maps were produced by using highest densities from either the boat or aerial density predictions where the CV was less than 0.3 and excluding predictions with CVs higher than 0.5. The natural log of the density (plus one) was then multiplied by each species wind farm collision sensitivity or displacement score and the resulting value summed across species in each 3 km×3 km grid cell. Note where neither dataset had predicted densities with CVs <0.5 the resulting score is exactly zero and highlights areas where across all species coverage and model fits were poor. Summer and winter maps use the same scale.

doi:10.1371/journal.pone.0106366.g006

\* Bradbury, G. et al., 2014. Mapping Seabird Sensitivity to Offshore Wind Farms. *PLoS ONE*, 9(9)



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# Acknowledgements

Thank you



Comhshaoil, Pobal agus Rialtas Áitiúil  
Environment, Community and Local Government

BORD NA MÓNA



NETWORKS



**Sinéad Cummins**  
**Species Policy Officer**  
**Policy, Communications & People Engagement**  
**Team**

[scummins@birdwatchireland.ie](mailto:scummins@birdwatchireland.ie)

[www.birdwatchireland.ie](http://www.birdwatchireland.ie)