



Freshwater Biodiversity Citizen Science

mapping the past, present, and future
of life in Irish lakes

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Marine Biodiversity Programme Manager
National Biodiversity Data Centre

1992 - 1996



1996 – 2004 (ish)



deepai.org

2004 - 2014



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Irish Whale
and Dolphin
Group



GMIT

WildOcean

2014 - Present



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Freshwater Biodiversity Citizen Science

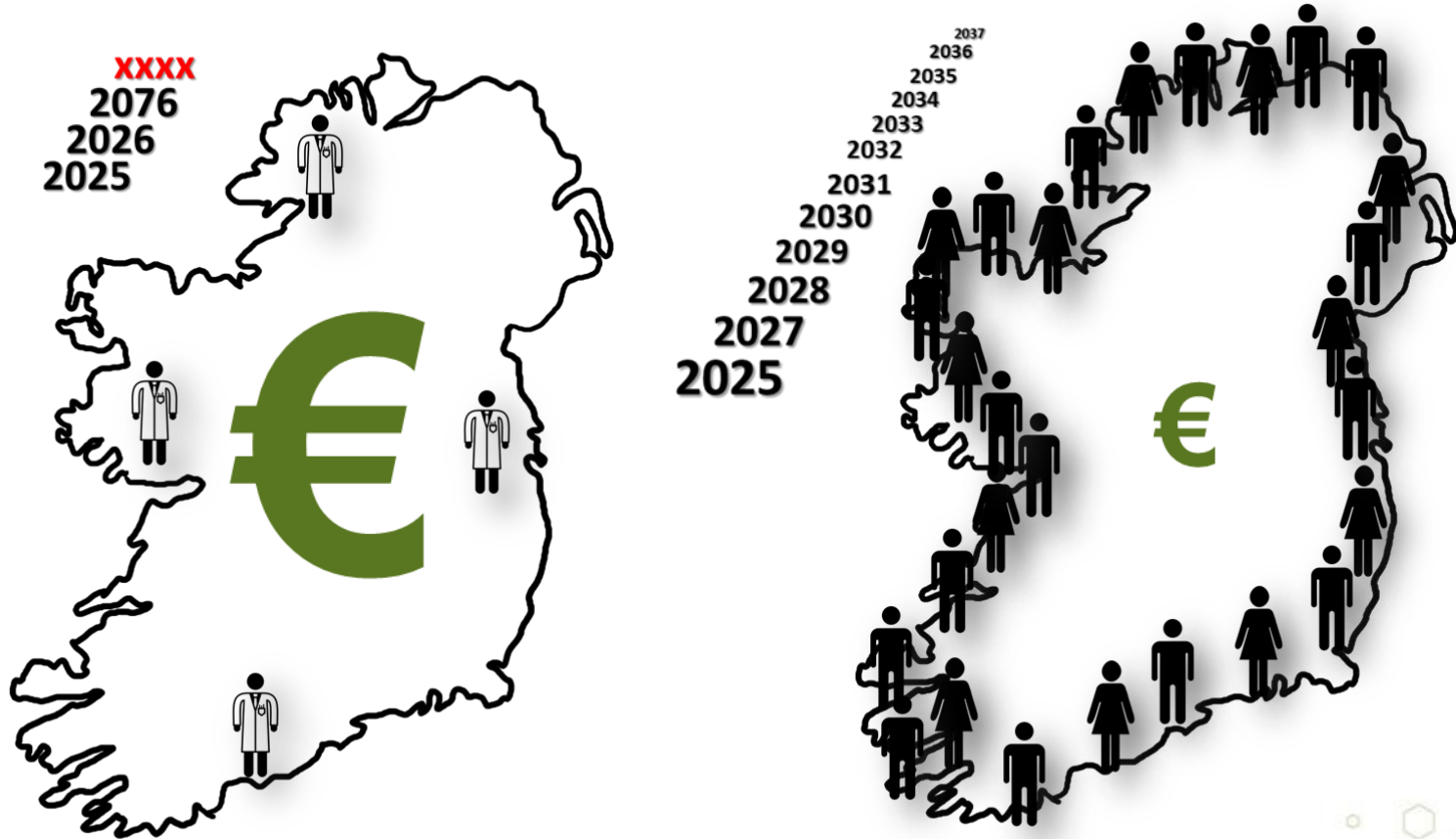
mapping the past, present, and future
of life in Irish lakes



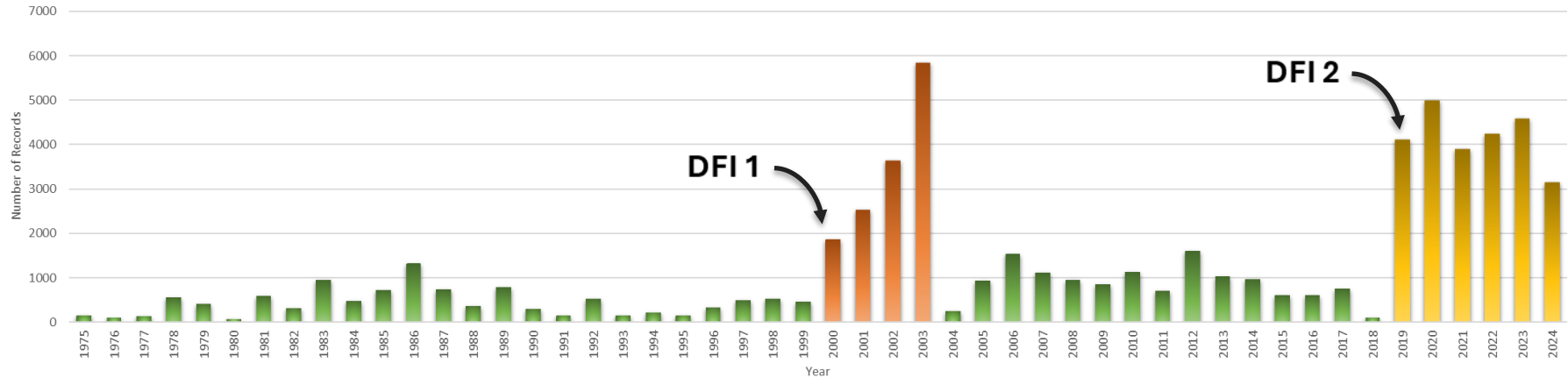
What is Citizen Science?

- Citizens doing Science to generate **new knowledge**
- Genuine **science** outcome
- Professionals **AND** Citizen Scientists benefit
- Citizen Scientists receive **feedback**
- Data generated is **Open Access**

Why Citizen Science?



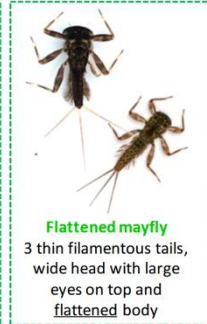
Citizen Science ≠ Free Science !



Citizen Science Stream Index (CSSI)

- based on the presence / absence of **6 key aquatic invertebrates**
- 3 pollution-sensitive invertebrates('good guys')
- 3 pollution-tolerant invertebrates ('bad guys')
- 3 x 30-second kick-samples

The 'good guys'



The 'bad guys'



Small Streams Risk Score (SSRS)

- For identifying rivers definitely 'at risk' of failing to achieve the 'good' water quality status goals of Water Framework Directive
- presence and abundance of indicator species
- assesses if a stream is **at risk from pollution** - not its ecological health.
- 2-minute kick sample + 1 minute stone wash + weed sweep (if appropriate)



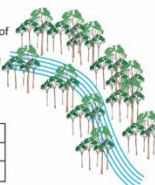
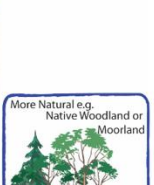
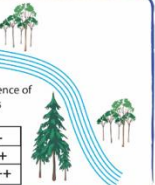
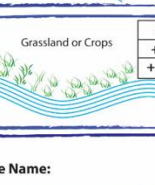
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Small Streams Characterisation System (SSCS)

- Engage local catchment champions in characterising streams
- ID macroinvertebrates – 5 categories based on sensitivity to pollution.
- Also, physical characteristics of the stream, plant life and other fauna.
- Identifying blockages to fish migration from and to the sea

Stream Setting - Select the Best Matches for Your Stream Site

Degree of Site Shading (e.g. by Trees)  <table border="1"> <tbody> <tr><td>+</td></tr> <tr><td>++</td></tr> <tr><td>+++</td></tr> </tbody> </table>	+	++	+++	Urban/Suburban  <table border="1"> <tbody> <tr><td>+</td></tr> <tr><td>++</td></tr> <tr><td>+++</td></tr> </tbody> </table>	+	++	+++	More Natural e.g. Native Woodland or Moorland  <table border="1"> <tbody> <tr><td>+</td></tr> <tr><td>++</td></tr> <tr><td>+++</td></tr> </tbody> </table>	+	++	+++
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Presence of Trees  <table border="1"> <tbody> <tr><td>+</td></tr> <tr><td>++</td></tr> <tr><td>+++</td></tr> </tbody> </table>	+	++	+++	Grassland or Crops  <table border="1"> <tbody> <tr><td>+</td></tr> <tr><td>++</td></tr> <tr><td>+++</td></tr> </tbody> </table>	+	++	+++				
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Site Name: _____

(Circle one of the +, ++, +++ (present, moderate, abundant) boxes in one or more of the panels to indicate the dominant land uses – leave blank if not applicable.)



Dragonfly Ireland 2019- 2024



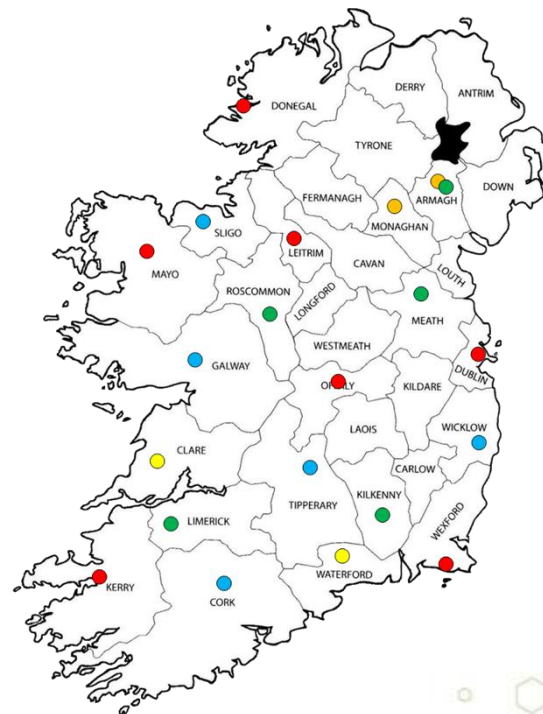
Dragonfly Ireland 2019 – 2024

- All-Ireland
- Dragonfly Ireland 2000 – 2003 baseline
- Gathering records for a 2024 Atlas
- Assess Dragonflies & Damselflies as bio-indicators of water quality and climate change
- Updated Red List
- Training and supporting a network of dragonfly recorders in Ireland



Dragonfly Ireland 2000 – 2003 Surveyors

Dragonfly Ireland 2019 – 2024



Dragonfly Ireland 2019 – 2024



Dragonfly Ireland 2019 – 2024



664 Wetland Site Images

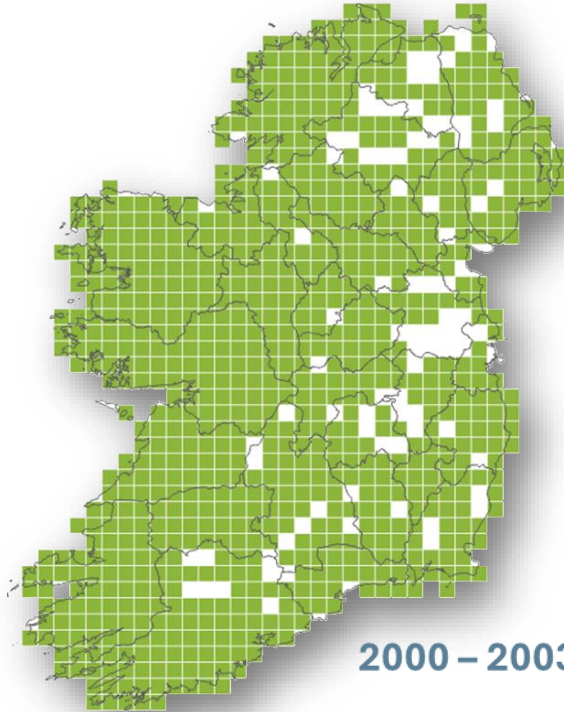


Record Validation

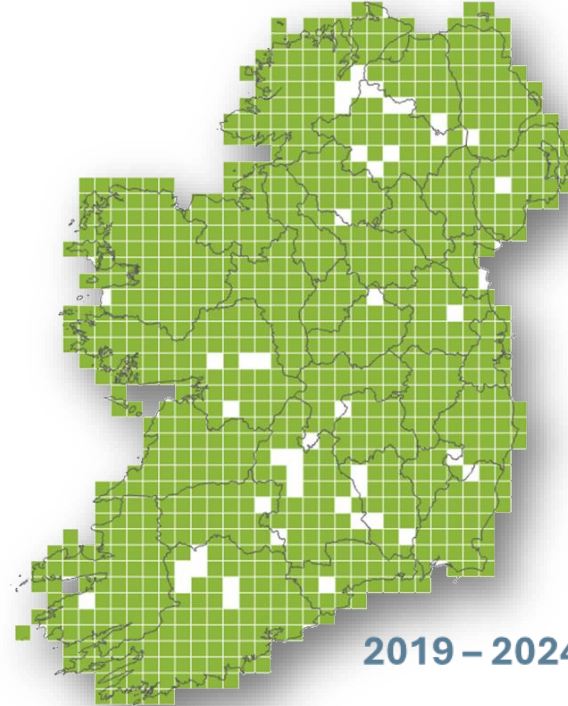


Six step validation process for Dragonfly Ireland Records

Dragonfly Ireland 2019 – 2024



2000 – 2003



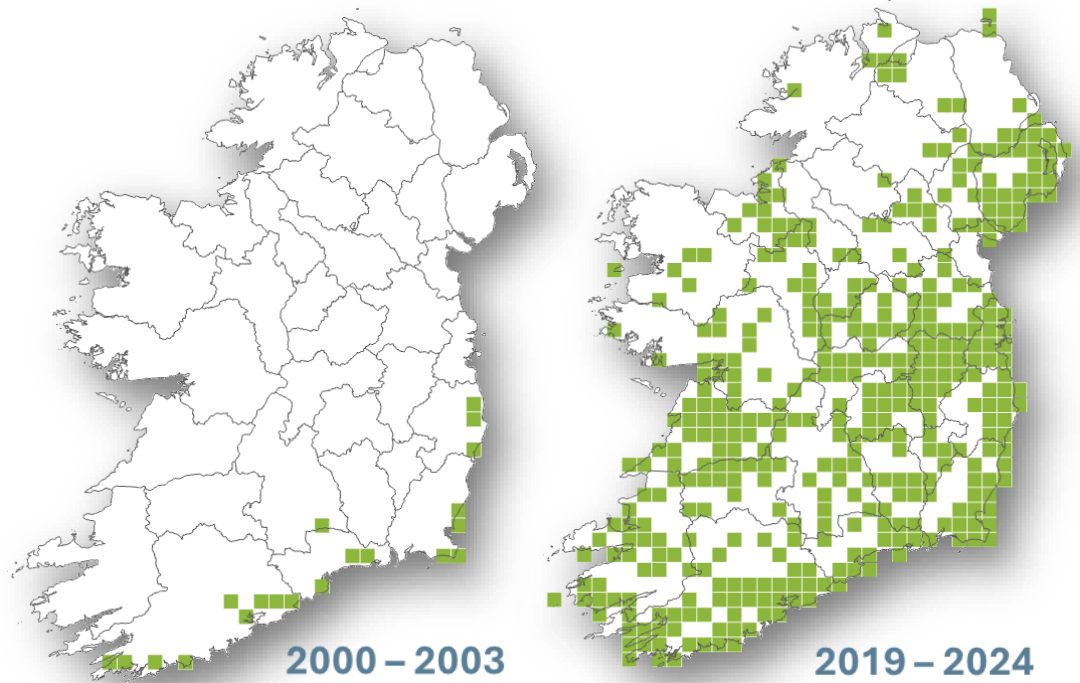
2019 – 2024

Analysis - Species Range Change

- Telfer's Change Index
 - compares species occupancy change to the average change across all species
- Reporting Rate Models
 - modeling the probability that an observer reports a species when it is present
- Frescalo
 - estimates species trends by adjusting for recorder effort and regional variation in survey intensity
- Occupancy Models
 - estimate the probability that a species occupies a site while accounting for imperfect detection

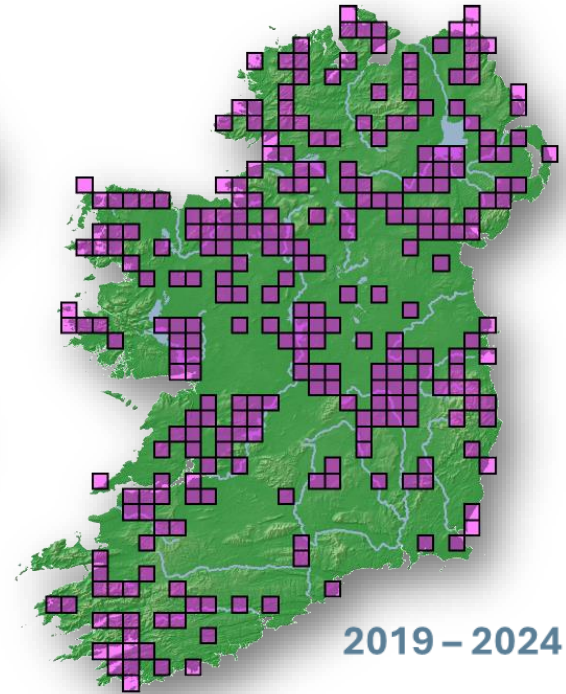
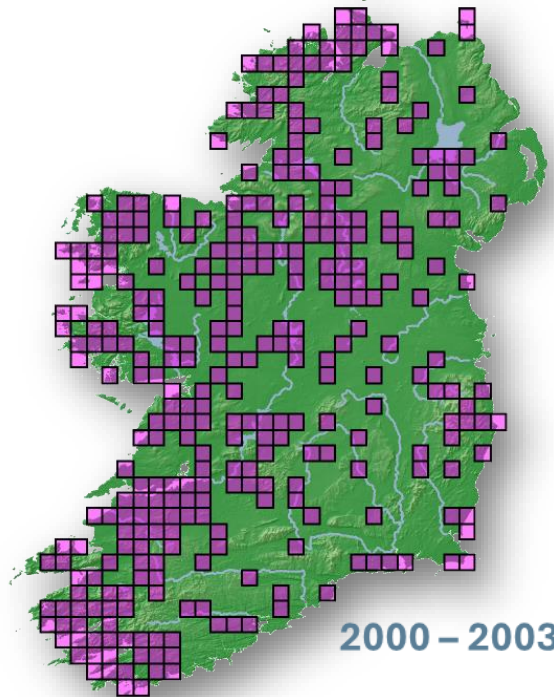
Dragonfly Ireland 2019 – 2024

Emperor Dragonfly (*Anax imperator*)



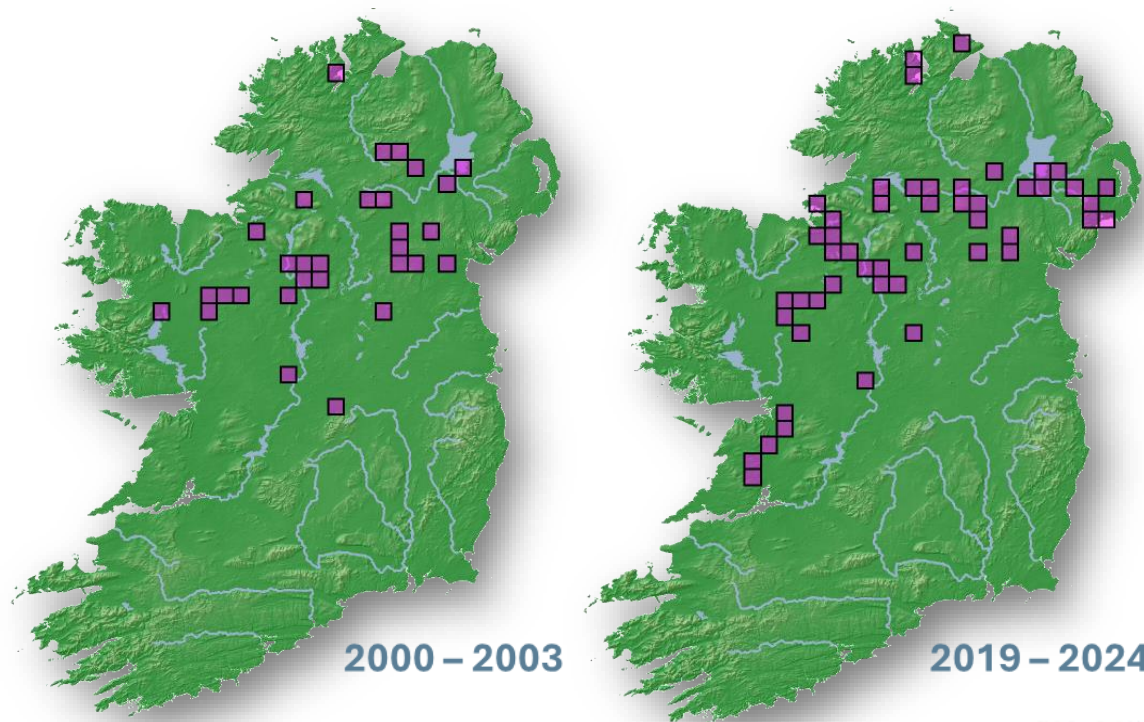
Dragonfly Ireland 2019 – 2024

Emerald Damselfly (*Lestes sponsa*)



Dragonfly Ireland 2019 – 2024

Irish Damselfly (*Coenagrion lunulatum*)



2000 – 2003

2019 – 2024

Dragonfly Ireland 2019 – 2024

Draft Analysis

Turlough/Ephemeral

- Ø Scarce Emerald Damselfly
- Ø Scarce Blue-tailed Damselfly
- ▼ Ruddy Darter

Calcareous Lakes

- ▲ Black-tailed Skimmer

Small Lakes

- ▼ Emerald Damselfly
- ▼ Common Hawker
- ▼ Variable Damselfly
- ▼ Black Darter
- ▶ Irish Damselfly
- ▶ Azure Damselfly
- ▶ Common Darter
- ▶ Four-spotted Chaser
- ▲ Hairy Dragonfly
- Ø Downy Emerald

Lakes

- ▲ Brown Hawker
- ▲ Migrant Hawker
- ▲ Emperor Dragonfly
- ▶ Common Blue Damselfly
- ▼ Blue-tailed Damselfly

KEY

- ▼ Decline in range
- ▶ No significant change
- ▲ Increase in range
- Ø No assessment possible

[illegible]

Dragonfly Ireland 2019 – 2024

Funders



An tSeirbhís Páirceanna Náisiúnta
agus Fiadhúlra
National Parks and Wildlife Service



COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL



Comhairle Chontae Uíbh Fhailí
Offaly County Council



Leitrim
County Council
Comhairle Chontae Liatroma



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Bhaile Átha Cliath
Dublin City Council



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Kerry County Council



Cork
County Council
Comhairle Contae Chorcaí



Comhairle Chontae na Gaillimhe
Galway County Council



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Comhairle Contae Thíobraid Árann
Tipperary County Council



Kilkenny County Council
Comhairle Chontae Chill Chainnigh



Comhairle Cathrach
& Contae Luimnigh
Limerick City
& County Council



comhairle chontae na mí
meath county council



Comhairle Contae
Ros Comáin
Roscommon
County Council

