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Improving the targeting of agri-environment schemes: the distribution of plants of conservation concern in Ireland

Key external stakeholders:

Research community,
Policymakers
Participants in agri-environment schemes
Agri-environmental researchers and NGOs

Practical implications for stakeholders:

- EU policy requires Member States to improve the protection of biodiversity, and to identify and direct agri-environment payments toward High Nature Value farmland.
- Conservation of farmland biodiversity will require conservation measures both for designated areas and for targeted areas of the (non-designated) wider countryside.
- Records of rare species can provide data to improve spatial targeting of conservation in the wider countryside.
- These results point to significant opportunities for the targeting of agri-environmental funding toward the protection and/or restoration of existing farmland habitats and species of conservation value. Many of these species and habitats occurred outside of designated areas.

Main results:

Areas outside of designated sites can have high biodiversity value. Knowledge of their distribution is necessary to ensure effective conservation strategies. A conservative estimate suggests that about 22–40% of areas with plant species of conservation concern do not overlap with designated areas (Natura 2000 and NHAs). For individual plant species, on average about 80% of records coincided with designated areas, but this value ranged from 0% to 100% depending on the species. Thus, the extinction of many of these plant species of conservation concern relies on the conservation of areas that occur outside of designated areas.

Opportunity / Benefit:

Knowledge of the distribution of important areas for plant diversity can facilitate enhanced spatial targeting of agri-environment schemes, and this targeting can be based on objective and transparent criteria. Improved spatial targeting will improve the value-for-money of agri-environment schemes. This project improves knowledge transfer from the science of nature conservation and ecology to agri-environment policy.
An improvement in capacity to implement spatial targeting in Irish agri-environment schemes is directly relevant to the EU policy requirement to identify and direct payments toward High Nature Value farmland. These biodiversity datasets can also be linked with other databases to improve projections of land use change in Ireland and their impacts on biodiversity.

Collaborating Institutions:

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National Botanic Gardens of Ireland, Glasnevin, Dublin 9
Department of Environmental Science, Institute of Technology Sligo, Ash Lane, Sligo

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1. Project background:

The conservation of biodiversity on farmland is critical to the EU and CAP policy objectives of halting the loss of biodiversity, and will mainly depend on effective agri-environment schemes and similar policy instruments. Recent reports on the conservation status of habitats and species clearly show that biodiversity loss in the EU and Ireland is not being halted, and there is stronger strategic emphasis on the use of agri-environment schemes (and other related policy instruments) to achieve biodiversity targets.

Biodiversity goals in the EU and Ireland will not be met solely from designated nature conservation sites, as up to 60% of European High Nature Value farmland is estimated to be outside of Natura 2000 areas. Thus, the targeting of agri-environment payments to areas of high biodiversity that occur outside of Natura 2000 sites is an EU policy objective. To date, effective implementation of this objective has been confounded by the absence of information on the spatial distribution of biodiversity in the wider countryside, and is a major gap in knowledge. Such spatial targeting for biodiversity would be consistent with EU policy objectives, as well as being a well-recognised method for increasing the value-for-money of agri-environment schemes.

2. Questions addressed by the project:

For the first time in Ireland, we collated a number of national-scale datasets of records of vascular plant distribution and used them to investigate the following questions:

- What is the coverage provided by distribution records for all recorded vascular plant species on the island of Ireland?;
- To what extent does the distribution of vascular plant species of conservation concern overlap with the Irish network of designated areas?;
- Does this distribution reveal a need for conservation measures outside of designated areas?

3. The experimental studies:

This study examined the distribution of vascular plant species of conservation concern (including protected species) that are relevant to the island of Ireland as well as specific categories for plants of high conservation value in the Republic of Ireland and Northern Ireland. The plant species of conservation concern were defined as those named in:

- The Flora Protection Order of Ireland
- The Northern Ireland priority species list
- The Irish Red Data Book of Vascular Plants

Records of species of conservation concern were extracted from: tetrad-scale data supplied by the Botanical Society of Britain and Ireland (BSBI); and supplemented by records of species of conservation concern extracted from rare plant inventories for the Republic of Ireland from the National Parks and Wildlife Service of Ireland (NPWS) and for Northern Ireland from the Northern Ireland Environment Agency (NIEA).

We created a geospatial data layer to map records of vascular plant species of conservation concern at the tetrad (2km x 2km) scale. We investigated the overlap of tetrads containing records of species of plants of conservation concern with designated areas. Designated areas consisted of Natura 2000 and Natural Heritage Areas boundaries for the Republic of Ireland, and Natura 2000 and Areas of Special Scientific Interest for Northern Ireland.

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4. Main results:

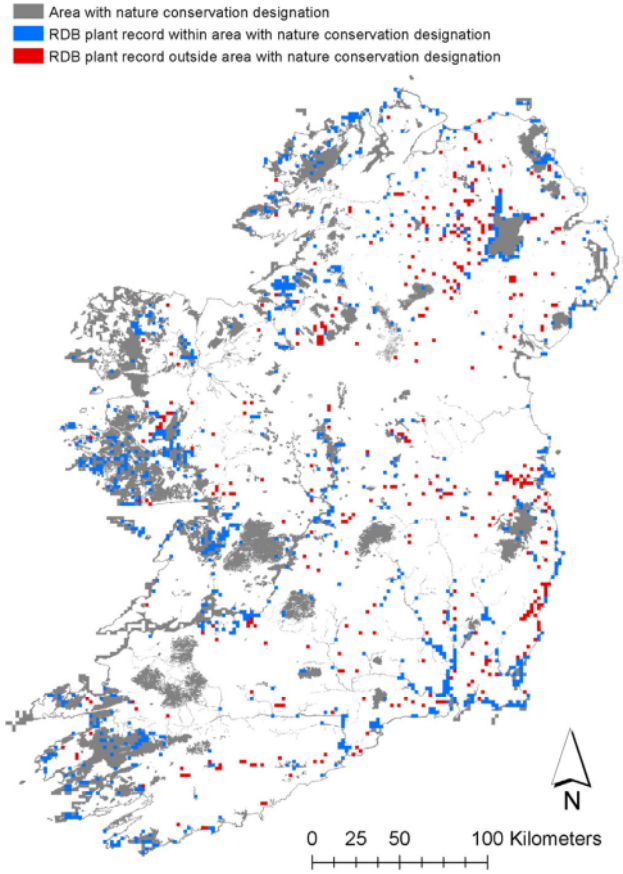

Fig. 1. The distribution of tetrads that contain Red Data Book (RDB) species in Ireland. The red tetrads illustrate locations that are conclusively outside of designated areas (and contain records of Red Data Book species) while the blue tetrads represent locations that coincide with designated areas.

The plant distribution database contained al total of 518,388 records. These records were distributed across 6773 (30%) of the 22,449 tetrads that encompass the terrestrial area of the island of Ireland. This shows that spatial coverage of the vascular plant data at the national scale is quite incomplete (Walsh et al. 2015).

For the first time in Ireland, we identified 176 plant species of conservation concern and mapped their spatial distribution at the tetrad (2 km × 2 km) scale (Fig. 1). This work was based on 6078 distribution records since 1987. Species of conservation concern were recorded in 2,468 of 22,449 tetrads. A conservative estimate suggests that many of these tetrads do not overlap with designated areas (in the range of 22–40% for available records) (Fig. 1). The coincidence of records of individual plant species with designated areas ranged from 0% to 100% (mean = 79%). Information on individual species and the extent to which they overlap with designated areas is provided in a supplement in Walsh *et al*. (2015).

5. Opportunity/Benefit:

The plant species of conservation concern represent a set of some of the rarest and most endangered vascular plant species. The extinction of many of these relies on the conservation of areas that occur outside of designated areas. The mapped distribution data for all vascular plant species offers guidance to where additional recording may be helpful in supporting conservation activities. The analysis of the distribution of species of conservation concern indicates the importance of both designated areas and the (non-designated) wider countryside for biodiversity conservation. This work highlights the need for conservation measures outside of designated areas.

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6. Dissemination:

The results of this project have been presented at a number of national and international conferences, and included as part of a number of in-service training events for Teagasc advisory staff.

Main publications:

Walsh, A., Finn, J.A., Jebb, M., Waldren, S. and Sullivan, C. (2015) The distribution of vascular plant species of conservation concern in Ireland, and their coincidence with designated areas. *Journal for Nature Conservation*, 24: 56-62.

Popular publications:

Finn, J.A. (2015) Plant species of conservation concern in Ireland. Farmland Ecology, blog post. http://farmecol.blogspot.ie/2015/02/publication-plant-species-of.html

Walsh, A., Finn, J.A., Jebb, M., Waldren, S. and Sullivan, C. (2014). The identification of important areas of plant diversity in Ireland. In: Teagasc Walsh Fellowship Seminar, Johnstown Castle, Wexford, 5th Dec 2014, p31.

Walsh, A., Finn, J.A., Jebb, M., Waldren, S. and Sullivan, C. (2013). How well does the Irish Natura 2000 Network encompass the occurrences of threatened and protected plant species? In: Environ 2013, Galway, 30th Jan 2013, p68.

Walsh, A., Finn, J.A., Jebb, M., Waldren, S. and Sullivan, C. (2013). BSBI data helps identify important areas of Irish plant diversity. In: Annual General Meeting of Irish regional branch of Botanical Society of Britain & Ireland, Killarney, Co. Kerry, 14th Sep 2013.

Finn, J.A. and Jebb, M. (2011). Important areas of plant diversity outside of designated areas: where are they? In: Conserving Farmland Biodiversity: lessons learned and future options, Ferrycarrig Hotel, Wexford, 25th May, 2011, p 6-7.

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