Extension of EURISCO for Crop Wild Relatives *in situ* data for the UK

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UK CWR Checklist to Inventory

Fielder *et al.,* 2015 did basic work

- UK Flora – 4,880 taxa and 3,445 different plant species (ferns, conifers & higher plants), 1,692 are native to Britain and 1,753 non-native (Stace 2019)
  - Over 50 million plant records (BSBI 2020).

- UK CWR checklist 2,110 taxa using broad definition (Maxted et al., 2006) 43% of flora
  - 21.5 million plant records (BSBI 2020).

- Prioritize checklist
  1. Use of related crop, according to GRIN Taxonomy for Plants (GRIN, 2015).
  2. Native Status (exclusion of casuals) (BSBI 2020).
  3. Economic value of related crop (FAOSTAT, 2013, Eurostat, 2013 and DEFRA, 2010)
  4. Degree of relatedness to crop: prioritising GP1b, GP2, or TG1b-TG3 taxa (Vincent *et al.,* 2013).
  5. Threat assessment: – prioritisation of threatened taxa (Cheffings and Farrell, 2005; Stroh *et al.,* 2014).
  6. Other conservation designations (JNCC, 2011)

- Prioritised UK CWR inventory of 211 species and 223 taxa

Dr Hannah Fielder

Beta vulgaris var. *aritima*

Brief CWR Inventory Analysis

Table 5. Taxa per family in priority inventory (Fielder 2015).

Family	Number of taxa
Alliaceae	13
Amaranthaceae	14
Apiaceae	6
Asparagaceae	2
Asteraceae	5
Betulaceae	2
Brassicaceae	15
Ericaceae	6
Fabaceae	67
Fagaceae	1
Geraniaceae	3
Grossulariaceae	8
Juglandaceae	1
Linaceae	3
Moraceae	2
Poaceae	48
Rosaceae	27
Total	223

Table 6. Native status of UK priority inventory (Stace, 2010; 2019)

| Native Status	Number of taxa
Archaeophyte	23
Introduced–Naturalised	55
Native	135
Possibly Native	2
Probably Introduced–Naturalised	3
Probably Native	5
Total	223

Brief CWR Inventory Analysis

Table 7. Great Britain IUCN Red list status of UK priority CWR inventory Taxa in 2015 and 2022 (JNCC, 2015; 2022).

Species Threat Assessment	Number of Taxa (2015)	Number of taxa (2022)
Extinct in the Wild	1	1
Critically Endangered	1	1
Endangered	4	8
Vulnerable	21	20
Near Threatened	5	5
Least Concern	135	133
Data Deficient	2	2
Not Evaluated	54	53
Total	223	223

UK priority CWR taxon analysis based on 803,755 occurrence records to 2km precision (Fielder 2015)
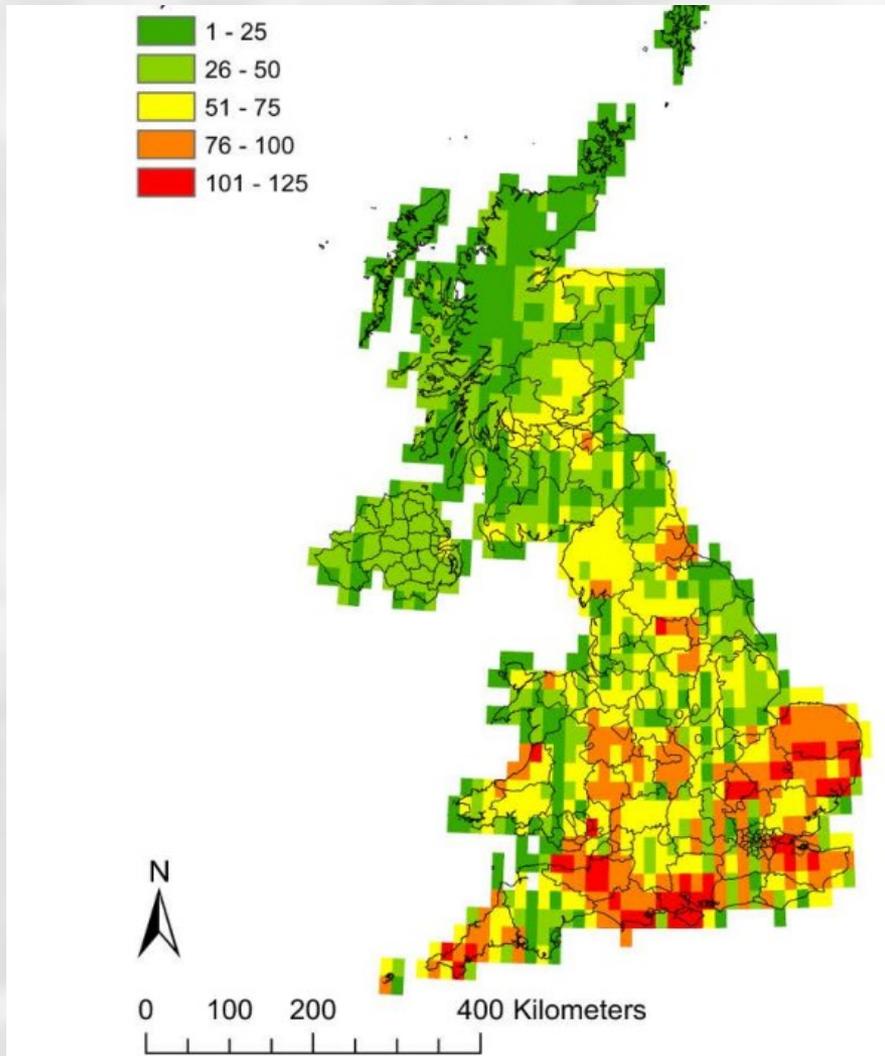
CWR taxon richness
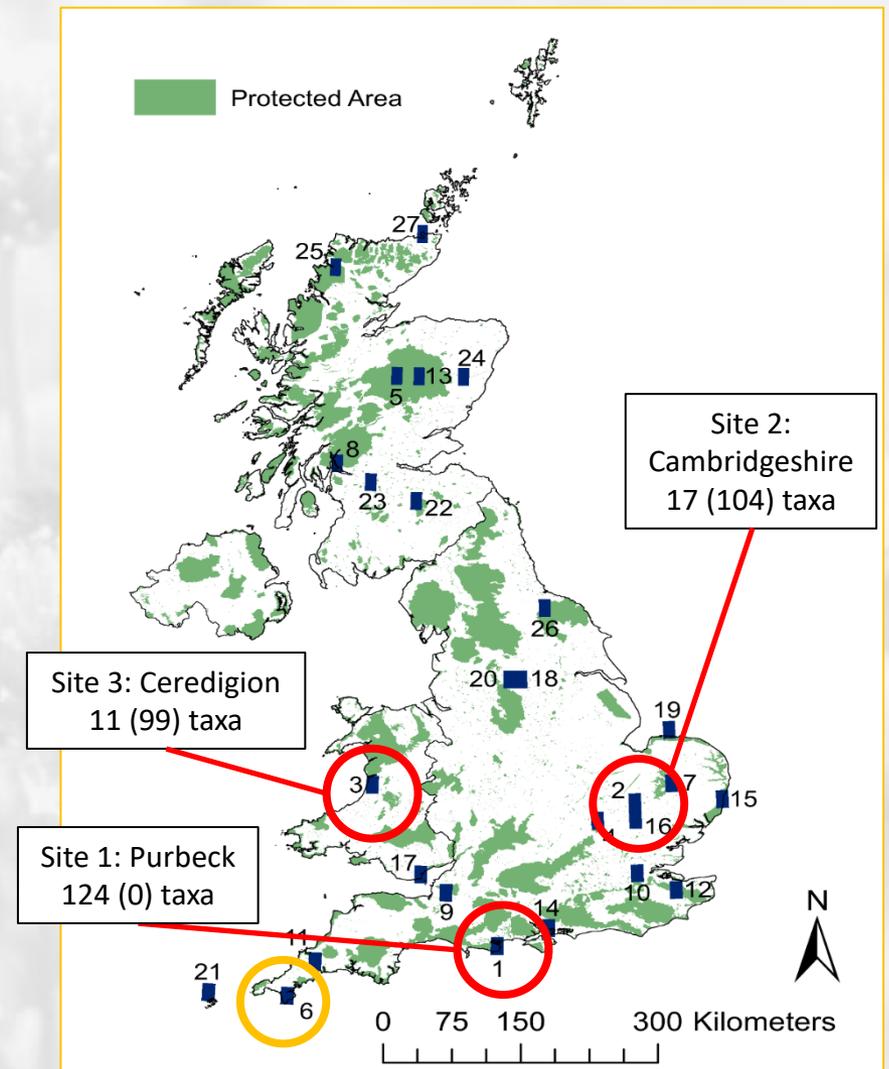
CWR complementarity analysis

Establishing the first CWR genetic reserve in the UK

The Lizard NNR in Cornwall SW England: survey of CWRs Spring 2010

- *Allium ampeloprasum* var. *babingtonii*
- *Allium schoenoprasum*
- *Asparagus officinalis* subsp. *prostratus*
- *Beta vulgaris* subsp. *maritima*
- *Daucus carota* subsp. *gummifer*
- *Linum bienne*
- *Trifolium occidentale*

Hannah Fielder
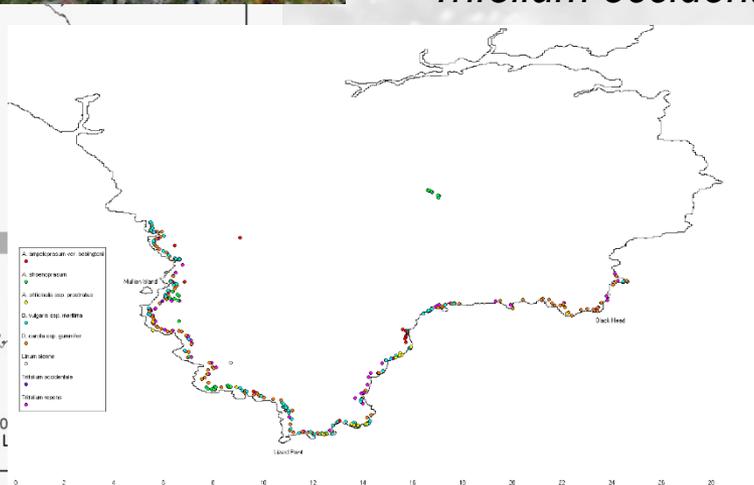
Defining breadth

Where do we draw the line:

Taxonomic breadth:

Checklist   -   2,110 CWR taxa using generic definition

Inventory   -   223 CWR taxa

Population breadth:

Breadth	Number of CWR taxa	Numbers of CWR pops.
All known priority CWR population present in UK	223	21.500,000
All actively or passively (NNR) conserved CWR populations in UK	210	155,396
Only actively conserved *in situ* CWR populations in UK	21	156

UK CWR Descriptors used

Taxon Level Inventory

Descriptor	Comments
TAXONID	Used National Biodiversity Network taxon IDs and accepted nomenclature of Stace (2019)
Genepool	Used both Genepool and Taxon Group concepts (Vincent et al., 2013)
NATIONAL_CAT	Used the 2014 UK Red List assessment (Stroh *et al.,* 2014)
	Taken from Plants of the World Online (Royal Botanic Gardens Kew, 2022)

Population Level Inventory

Descriptor	Comments
MNGINSTCODE	Due to size of dataset, will not be available for all records.
MNGINSTNAME	Due to size of dataset, will not be available for all records.
HERBCODE	Not included – data collected from online source.
HERBNAME	Not included – data collected from online source.
SPECNUMB	Not included – data collected from online source.
CONSACTION	Dataset was too large to investigate each record so descriptor kept at 0 for all records.
MLSSTAT	Dataset was too large to investigate each record so descriptor kept at 0 for all records.
OCCURSITE	It is worth noting that UK Ordinance Survey Grid cell references are often used, e.g. "TM406467". A GeoPackage containing the OS Grids is available to download at: https://github.com/OrdnanceSurvey/OS-British-National-Grids/
ELEVATION	Elevation provided by joining with LiDAR DSM data provided by the Environment agency, covering 93% of England at 2m spatial resolution. However, the data is for the highest object / structure detected on the ground (such as trees, buildings) so data may be slightly higher than real elevation.
POPSRC	Used UK CEH Land Cover Class, data sourced from Marston et al. 2021
Record_In_PA	Either "YES" or "NO" depending on if the record is found within a protected area

UK CWR Descriptors used

Descriptor	Comments for Inventory
PUID	Kept blank to be filled in by official method at a later date
INSTCODE	All records are for Natural England
INSTNAME	All records are for Natural England
ACCENUMB	Not applicable
LIAISONCODE	Preliminarily set to IBERS
LIAISONNAME	Preliminarily set to IBERS
COLLSITE	It is worth noting that UK Ordinance Survey Grid cell references are often used, e.g. "TM406467". A GeoPackage containing the OS Grids is available to download at: https://github.com/OrdnanceSurvey/OS-British-National-Grids/
SITEPROT	Elaborated NNR name in remarks field
ELEVATION	Elevation provided by joining with LiDAR DSM data provided by the Environment agency, covering 93% of England at 2m spatial resolution. However, the data is for the highest object / structure detected on the ground (such as trees, buildings) so data may be slightly higher than real elevation.
OTHERNUMB	Occurrence ID from NBN
POPSRC	Land cover data obtained from Marston et al. 2021 and joined using the Join by Attributes tool in QGIS
MLSSTAT	Wild
REMARKS	Some accession remarks may apply to COLLSITE descriptor.

Discussion points

- Taxonomic breadth: inventory only

- Population breadth: actively or passively (NNR) conserved

- Population data bias: even with 21.5 pop record still biased

- Linking *in situ*, *ex situ* and use – nominated national responsibilities of plant genetic resource centres
  - JIC – Cereals and peas
  - Warwick – Vegetables
  - Aberystwyth – Forages = National EURISCO Focal Point
  - RBG Kew (MSB) – Other taxa

- Link to UK Ag Bill (2020) and CAP reform

- Linking to ECPGR CWR WG and Phase XI Targets - Plants