

Science for Environment Policy

Wild plant conservation efforts could benefit farming and food security

Conservation of wild plants related to important crops requires more concerted efforts, according to a new study conducted in Scotland. The study makes recommendations for improving conservation within Scotland, as well as outlining a process that could help other countries to prioritise their wild plants.

Crop wild relatives (CWR) are wild plants relatively closely related to cultivated crops. They are important because their genes encode traits that have been useful for agricultural breeding programmes, for example, to produce more resilient crops able to withstand the adverse impacts of [environmental change](#). One wild relative of barley (*Hordeum bulbosum* L.), for instance, has genes that help it to resist diseases such as leaf rust, a fungal disease which can cause leaves to die. Within the EU, Finland, Spain, Italy, Cyprus and the Czech Republic have already developed CWR priority lists, each using different criteria — and other countries are following suit.

Working from a checklist of 1259 taxa (biological classification groups), the researchers identified Scottish CWR plants that should be prioritised for conservation. Native species, those that were more closely related to widely cultivated crops with a high economic value, and those considered under threat were prioritised.

The 102 species and 18 subspecies that the researchers prioritised represented approximately 10% of the taxa in the original checklist and a total of 14 plant families, including grasses related to cereals (Poaceae), members of the cabbage family (Brassicaceae) and legumes (Fabaceae). Thirteen taxa were classified as threatened, 10 as vulnerable, two as endangered and one as critically endangered, while another 17 had other conservation designations, such as being on the [Biodiversity List for Scotland](#).

Of the 120 species and subspecies, the researchers were able to plot observations for 112 onto a map of Scotland, in combination with existing conservation areas and potential sites for conservation. Mapping showed that 88% already grow in at least one existing protected area and 71% grow in five or more protected areas. It also revealed a number of CWR hotspots across the country, including to the west of Glasgow where there are rich concentrations of the prioritised plants. The researchers suggest that initial conservation efforts should focus on this region.

Finally, priority CWR were categorised based on the number of seed samples that have been collected/stored in gene banks and the extent to which these samples represent the widest geographic range of the taxa in the wild, with the aim of maximising genetic [diversity](#). Eighty-eight percent of taxa were assigned the highest priority level, indicating that urgent collection from wild Scottish populations and storage of seed samples in gene banks is needed. Of the 120 species and subspecies, only 15 were already stored in gene banks. Five, including a vulnerable grass known as [Scottish small-reed](#) (*Calamagrostis scotica*), which is found nowhere else in the world, had only one seed sample stored in a gene bank.

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According to the researchers, the results reveal a lack of focus on conserving the genetic diversity of CWR in Scotland. They recommend that priority species be incorporated into conservation plans within existing protected areas and the link between protected area conservation and food security be made to highlight the value of conserving these vital species to the general public. Outside these areas, conservation will require land owners and managers to work together to resolve potential conflicts over [land management](#) strategies. Further recommendations include: continued efforts, potentially using citizen science, to monitor existing populations of priority species; promotion of their value among crop breeders; and conservation of at least five different populations of each CWR *in situ* — with complementary seed collections stored in gene banks elsewhere.

Efforts to conserve Scottish CWR will contribute to agricultural diversity and food security. The hotspot and mapping analyses used in the Scottish process could be useful to other countries attempting to develop priority lists, complementary national conservation strategies and CWR conservation areas. The researchers suggest that the process for prioritising CWR conservation should address global policy targets as well as the concerns of national stakeholders.

The CWR checklist for Scotland is publicly available from [Bioversity International](#) along with those for England, Spain and Wales.

