



Extension of EURISCO for Crop Wild Relatives (CWR) *in situ* data and preparation of pilot countries' data sets

Short title: CWR data in EURISCO

Proposal submitted for funding to the German Federal Office for Agriculture and Food

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1. Background

Crop wild relative (CWR) genetic resources native to Europe are related to the many socio-economically important crops cultivated in the region and in other parts of the world and contain a wide pool of evolving genetic diversity of potential value for crop improvement. New challenges from climate change increase the need to explore potential sources of new diversity. Moreover, innovative molecular technologies are making it easier to investigate wild gene pools to find useful alleles.

The need for conservation and documentation of CWR has been recognized by the Convention on Biological Diversity (CBD), the Second Global Plan of Action (GPA) for Plant Genetic Resources for Food and Agriculture and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), among other important instruments and plans.

In particular, Priority activity 4 of the [Second GPA](#), section 82.k), puts emphasis on the need to “*collate information on CWR ... and make the information available through National Information Sharing Mechanisms and specialized global information systems*”. In fact, lack of access to data and the scarce or absent exchange of information are key factors affecting the conservation and use of PGRFA.

Since 2014, the ECPGR Documentation and Information Working Group discussed the issue of *in situ* conservation data and recommended their inclusion in the EURISCO catalogue. The recommendation to use EURISCO to document data related to the most appropriate wild populations of CWR was also made in the ‘ECPGR Concept for *in situ* conservation of crop wild relatives in Europe’, a document endorsed by the ECPGR Steering Committee in March 2015. These recommendations were picked up by the ECPGR Steering Committee when they agreed on the ECPGR objectives for Phase X (2019-2023). Specifically, ECPGR Objective 2 is ‘*to provide passport and phenotypic information of actively conserved European PGRFA diversity ex situ and in situ through the EURISCO catalogue*’.

Specifically, output 2.3 of the ECPGR objectives calls for “*Inclusion of relevant in situ CWR data in EURISCO*”.

The ‘**European Strategy for conservation and sustainable use of plant genetic resources**’ (PGR Strategy), submitted in October 2021 for endorsement of the ECPGR Steering Committee, recognizes that many national programmes within the European region have a growing evidence-base concerning CWR diversity, conservation and use. Checklists and inventories have been produced in over 20 countries. In Europe, Germany was the first country to have officially designated genetic reserves for selected CWR, and a few other countries are in the process of doing the same.

One of the PGR Strategy objectives reads that “*By 2030 Europe has significantly increased its CWR [...] inventory to enable a more comprehensive view of available CWR [...] genetic diversity, to better understand how this diversity is distributed across the region and its neighbouring countries, and to identify which are the priority populations to actively conserve*”. The proposed approach to reach this objective includes “*the provision of data – as appropriate – from in situ conserved populations of CWR [...] (from National Inventories) to a centralized information system, based on agreed data exchange standards.*”

Two related 2030 targets of the PGR Strategy are the following:

- *Europe has a coherent, comprehensive, coordinated and centralized documentation of CWR [...] in situ diversity.*
- *EURISCO contains high-quality passport data of all European ex situ collections, progressively extended to include actively-managed in situ CWR populations [...] data.*

During its second meeting of July 2021, the EURISCO Advisory Committee discussed the scope of EURISCO and noted that data related to *in situ* material were still not included and that a policy defining what kind of material should be included in the catalogue was missing. In the case of CWR *in situ* data, questions to be answered would be related to which requirements should apply to *in situ* data (such as ‘well-managed populations’ and ‘available for distribution’).

The Committee agreed on the need to prepare a proposal for the extension of EURISCO to host *in situ* data, also clarifying what would be needed in terms of staff time, as well as the options for establishing a specific data flow mechanism.

A technical prerequisite for inclusion of data is the existence of a suitable data exchange standard and the Committee recommended the use of the “Descriptors for Crop Wild Relatives conserved *in situ*” published by FAO in 2021 as the standard for *in situ* data. These internationally accepted standards were developed by FAO with the support of a German funded project started in 2019. In fact, a representative from the FAO Treaty attended the EURISCO Advisory Committee meeting and it was agreed to maintain a close collaboration for the future fine-tuning of the EURISCO and FAO descriptors.

The EURISCO Advisory Committee also considered that it is necessary to establish criteria to decide which populations should become “*in situ* accessions” in EURISCO. It is not practical to include all populations that are within protected areas, since already more than five hundred thousand populations are present in Natura 2000 areas. What is important is that some active conservation is in place (it could be just periodical monitoring, and having an institution taking responsibility for each population). Data should be provided by National Coordinators or National Focal Points. This type of information is not yet available, but EURISCO should be prepared to enable the first countries to start feeding data, since a number of countries have identified CWR priority populations and/or are in the process of defining genetic reserves for CWR conservation.

In August 2021, the EURISCO Coordinator prepared a memo for the extension of EURISCO for *in situ* data. Herewith it was noted that, while the addition of information on well-managed *in situ* CWR seems reasonable, this cannot be answered clearly for on-farm landraces data. An important prerequisite for the operation of a central search catalogue such as EURISCO is the regular updating of the data available there. While this can be considered rather uncritical for *in situ* CWR, the associated logistical effort is much greater for on-farm conservation. For this reason, on-farm data should be excluded for the time being and the focus placed only on *in situ* CWR. The FAO descriptors for CWR are a good starting point for data exchange, but from the point of view of EURISCO coordination, a few additions and reciprocal fine-tuning will be necessary. This memo also suggested to use the existing EURISCO infrastructure for *ex situ* data and only carry out the necessary extensions. On the other hand, developing a stand-alone database schema for *in situ* CWR data would allow greater flexibility in terms of modelling, but would also require significantly more effort. Based on the assumption that a qualified developer would be available full-time, the necessary implementation time for the extension of passport data of *in situ* CWR was estimated to be 12 months. The time for discussions on necessary additions and/or changes to the FAO *in situ* CWR data standard (ca. 3-6 months) would also need to be considered.

This project intends to promote the definition of the scope of the type of *in situ* CWR data that would be beneficial to include in EURISCO. The proposed scope should then be agreed within the ECPGR community, including the definition of the data exchange standard to be adopted at ECPGR level. The project also intends to establish an agreed mechanism for data flow from national inventories to EURISCO, either through the existing National Inventory Focal Points or through a newly created network of specific CWR Focal Points.

The EURISCO catalogue will also be extended and prepared to host and make the *in situ* CWR data provided by the European countries publicly available. In parallel, a group of pilot countries will be supported in the organization of their internal data flow and data gathering mechanisms and in the preparation of their *in situ* CWR data according to the standard and requirements defined in this project. Provision of data from these pilot countries will populate the new EURISCO extensions and offer examples for all other countries to follow.

Implementation of this project will endow the European region with a centralized, public and web searchable inventory of *in situ* CWR priority populations' passport data and with a fine-tuned data flow mechanism utilizing an internationally agreed data exchange standard. An initial set of data from a few pilot countries will also be made available. The extension of EURISCO to *in situ* data will create a link with the existing *ex situ* data and thus improve the *ex situ/in situ* conservation interface. The new *in situ* leg of the EURISCO catalogue will be built in compliance with the 'FAIR principles' of findable, accessible, interoperable and reusable data. Overall, the online central catalogue of *in situ* CWR populations' data will be in operation at the end of the project and European countries will be trained and encouraged to add their country data. Increasing availability of *in situ* CWR data will facilitate monitoring the conservation of key CRW populations and also provide easy-to-access information to potential users seeking new resources to be included into breeding and pre-breeding programmes. The implementation of international commitments defined by the CBD, GPA and ITPGRFA, as well as by the PGR Strategy, will make a significant step forward.

2. Objectives of the project

- a) Definition and agreement on the scope of EURISCO in terms of *in situ* CWR data (type and requirements of populations to be inventoried)
- b) Agreement at ECPGR level on the principles and mechanisms for inclusion of *in situ* CWR data in EURISCO
- c) Extension of EURISCO to enable hosting and public display of passport data of European *in situ* CWR populations
- d) Preparation and inclusion in EURISCO of datasets from seven pilot countries

3. Activities

i. **Preparation of draft proposal setting the principles for the inclusion of CWR data into EURISCO**

A draft proposal will be prepared through a consultancy assigned to two members of the EURISCO Advisory Committee (the Chair Theo van Hintum, CGN, Wageningen, The Netherlands, and the *in situ* CWR expert Jose' Iriondo, URJC, Madrid, Spain). The proposal will be finalized in consultation with the entire EURISCO Advisory Committee and the Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture. The proposal will include principles and requirements for data inclusion, definition of a data flow mechanism and the proposed data exchange standard (CWR passport descriptors).

ii. **Coordination of steps required to reach ECPGR agreement on the principles and mechanisms**

The above proposal will be circulated for comments to the ECPGR Working Groups on Documentation and Information and on Wild Species in genetic reserves. The final document will eventually be submitted to the ECPGR Steering Committee for endorsement.

iii. **Coordination of steps required to set up the *in situ* CWR data flow mechanism**

In case the agreement will require appointment of specific *in situ* CWR documentation Focal Points, the ECPGR Secretariat will make sure that these nominations are made and registered on the ECPGR web site. The ECPGR Secretariat will follow up with support of any other aspect of the data flow mechanism setup, as required.

iv. **Support of pilot countries in their preparation and delivery of *in situ* CWR data to EURISCO**

Tasks will include, where relevant: identify priority taxa and populations, prepare the national database structure, organize the network of data providers, collect and organize the data according to the agreed principles and data exchange format, provide the data to EURISCO. Pilot countries were selected on the basis of prior existence of a national undertaking towards identifying CWR priority populations for conservation and on their preparedness and availability to become project participants: Cyprus (tbc), Czech Republic, Germany, Lithuania, Portugal, Spain, UK.

v. **Preparation of EURISCO extension to *in situ* CWR data**

A bioinformatician will be hired at IPK, Gatersleben, Germany, to carry out the following assignments:

- Adjustment/extension of EURISCO's database structure
- Development of import tools for *in situ* CWR data
- Development of procedures for data integrity checks and data integration (reuse of existing procedures for *ex situ* data as far as possible)
- Extension of the EURISCO web interface according to user requirements

vi. **Training of Focal Points**

Necessary training of country Focal Points in charge of transferring *in situ* CWR data to EURISCO will be carried out by the EURISCO Coordination. These will be online workshops or webinars, as far as possible. The EURISCO Coordination will also extend its permanent help desk function to facilitate delivery of CWR data by the European countries to EURISCO.

vii. **Public awareness products to publicize extension of CWR in EURISCO**

In order to publicize the new functionalities of EURISCO and to encourage the population of the catalogue with appropriate CWR data, the ECPGR Secretariat will design, prepare and disseminate appropriate public awareness products (articles, flyers, posters, web information campaign, etc.)

4. Expected outcomes

- a) Policy and technical document defining the principles and requirements for the inclusion of *in situ* CWR data in EURISCO
- b) Endorsement of the *in situ* CWR data policy and technical document by the ECPGR Steering Committee
- c) *In situ* CWR data flow mechanism established in Europe with responsibilities assigned at country level and Focal Points trained
- d) Extension of EURISCO to receive *in situ* CWR data completed (database structure, import tool, data integrity procedures and web interface)
- e) *In situ* CWR data from seven countries included in EURISCO
- f) Public awareness products publicizing the EURISCO *in situ* CWR component

5. Chronogram of activities

	2021		2022				2023			
Activity	Nov-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	
Preparation of draft proposal setting the principles for the inclusion of CWR data into EURISCO										
Coordination of steps required to reach ECPGR agreement on the principles and mechanisms										
Coordination of steps required to set up the in situ CWR data flow mechanism										
Support of pilot countries in their preparation and delivery of in situ CWR data to EURISCO										
Preparation of EURISCO extension to in situ CWR data										
Training of Focal Points										
Public awareness products to publicize extension of CWR in EURISCO										