

WILD SPECIES CONSERVATION IN GENETIC RESERVES WG REPORT FOR PHASE IX (2014-2018)

Submitted to the 15th Steering Committee Meeting, Thessaloniki, Greece, May 2018
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Date of compilation: 3rd March 2018

1. CONTRIBUTION TO ECPGR OBJECTIVES

1.1. Achievements and success stories

Outcome 3. In situ conservation of priority crop wild relative (CWR) and landrace (LR) populations are implemented throughout Europe. Mechanisms are in place for more effective utilization of the conserved germplasm.

- National level CWR conservation strategy development workshops held in Albania, Bulgaria, Cyprus, Czech Republic, Finland, Norway, Poland and Turkey.
- The ECPGR *Concept for In situ conservation of crop wild relatives in Europe* was completed, agreed by the Steering Committee and published in March 2015.
- November 2017 to October 2020: EC H2020 SFS-04-2017 project '*Networking, partnerships and tools to enhance in situ conservation of European plant genetic resources*' (Farmer's Pride). The project is focused on delivery of the ECPGR *Concept for in situ conservation of crop wild relatives in Europe*. It will establish a network of stakeholders and conservation sites that effectively coordinates CWR (and LR) conservation actions to safeguard the wealth of Europe's *in situ* plant genetic resources (PGR) and integrates CWR conservation with the user community to maximize their sustainable use. It will produce the following project deliverables:

Deliverable (number)	Deliverable name	Type	Delivery date (in months)
D1.1	Identify <i>in situ</i> stakeholders	Report	8
D1.2	Knowledge of <i>in situ</i> resources/sites	Report	20
D1.3	LR Network Showcases	Report	34
D1.4	LR hotspots identification	Report	34
D1.5	CWR Network Showcases	Report	34
D2.1	CWR population management guidelines	Report	30
D2.2	<i>In situ</i> conservation information management tools	Informatic tool	30
D2.3	Community seedbank management guidelines	Report	30
D2.4	LR population management and access guidelines	Report	34
D2.5	Concept for <i>in situ</i> inclusion in EURISCO	Report	34
D2.6	Integrated <i>in situ</i> and <i>ex situ</i> conservation guidelines	Report	34
D3.1	Analysis of effectiveness of <i>in situ</i> support	Report	21

Deliverable (number)	Deliverable name	Type	Delivery date (in months)
	mechanisms		
D3.2	Analysis of public will to fund <i>in situ</i> conservation	Report	21
D3.3	Identify <i>in situ</i> areas with useful adaptive traits	Report	34
D3.4	Showcase showing improved <i>in situ</i> resource access	Demonstration	34
D3.5	Strategic Action Plan for PGR <i>in situ</i> maintenance	Report	34
D3.6	Policy dialogue workshop to enhance <i>in situ</i> maintenance	Report	36
D4.1	Integrated national/European <i>in situ</i> conservation/use network structure	Report	18
D4.2	LR Network Design	Report	30
D4.3	CWR Network Design	Report	30
D4.4	European <i>in situ</i> conservation network of sites/stakeholders	Network	36
D5.1	Project workshops	Report	3, 12, 22
D5.2	Project website	Website	6
D5.3	Communication strategy	Report	8
D5.4	Media strategy	Report	8
D5.5	Annual newsletters for CWR & LR	Report	12, 24,34
D5.6	Publication of case studies, best practice & tool kits	Report	14, 30,35
D5.7	Advocacy plans confirmed, milestones met	Report	18
D5.8	Dissemination conference	Report	35

- One issue of the Crop Wild Relative Newsletter (February 2015)
- Conference proceedings: Maxted, N., Ehsan Dulloo, M. & Ford-Lloyd, B.V. (eds.) (2016). Enhancing Crop Genepool Use: Capturing Wild Relative and Landrace Diversity for Crop Improvement. CAB International, Wallingford, UK. ISBN-13: 978-1-78064-613-8
- Working Group members (German Federal Office for Food and Agriculture, and CGN Netherlands) were consortium members in the EU Preparatory Action ensuring consideration of CWR *in situ* conservation and strategies. The Preparatory Action recommended the development of a European agrobiodiversity strategy and opened the opportunity for ECPGR to participate in the proposal GENRES-bridge submitted under the Horizon2020 Work Programme 2018-2020 SFS-28-2018-2019-2020: Genetic resources and pre-breeding communities.

1.2. Gaps or constraints identified

When we have just started a new H2020 project designed to implement the ECPGR *Concept for In situ conservation of crop wild relatives in Europe* it would be difficult to pre-empt the risks associated with the project and the concept's implementation. However, as part of the Farmer's pride application we identified in advance what we thought were the critical risks for implementation and these are outlined below:

Description of risk	Risk Level	Proposed risk-mitigation measures
FP Task 2.6. aims to develop a back-up strategy for <i>in situ</i> and facilitate the integration of <i>in situ</i> and <i>ex situ</i> conservation in two countries, The Netherlands and Spain. The success of the application will be conditioned by logistic, administrative, political, legal and socio-economic constraints.	Medium	Relevant conclusions will be obtained simply by identifying and facing the different constraints. The partners will previously identify the stakeholders (farmers, protected area managers, local administrations) that are more likely to engage in this initiative with a positive and collaborative attitude.
FP Task 3.5 will engage in a policy dialogues between various PGR stakeholders and policy and decision makers, a risk is associated if the policy and decision makers do not take heed of project recommendations to ensure the sustainability of the network within participating countries	Medium	The project will inform policy and decision makers about the importance and value of CWR and LR for agricultural development and the need to establish a network of sites and stakeholder for conservation and use that will in the medium and longer underpin the conservation and use of this critical PGR agricultural biodiversity. The awareness raising of PGRs economic and food security value will be critical for engagement with policy makers in the project.
FP Task 4.1 will report on the potential structures for establishing an integrated national / European <i>in situ</i> conservation / use network, much of the discussion will focus on technical issues but for the network to be self-sustaining it requires an appropriate governance authority. The risk is will it be possible to find an agency in Europe willing to play such a role.	High	This risk was recognized by two recently developed ECPGR <i>In Situ</i> and On-farm Concepts ^{1,2} who recommended discussion of these governance-related issues with the relevant players (e.g., the EC, EEA, ESA, EUCARPIA and possibly commercial entities). The earliest engagement with these organization is foreseen by the Project Coordinator on behalf of Farmer's Pride's consortium committee.
FP Task 4.4 includes the initial launch of the <i>European in situ conservation network of sites and stakeholders</i> we plan to include 30 sites but we are not certain so many can be recorded	Low	The experience of the consortium partners in <i>in situ</i> PGR conservation and the wide involvement of other partners across Europe mitigates this risk as it is known that such sites already exist the project will link sites and ensure management consistency, in addition during the project preparation these known site have committed to inclusion
Task 4.4 includes the initial launch of the <i>European in situ conservation network of sites and stakeholders</i> we plan to include 5,000 stakeholders but we are not certain so many can be recorded	Low	The experience of the consortium partners in <i>in situ</i> PGR conservation and the wide involvement of other partners across Europe mitigates this risk as it is known that such stakeholders are already interested in being linked by the network

A priori the risk that is most concerning is associated with FP Task 4.1, the establishment of a governance structure to sustain the integrated national / European *in situ* conservation / use network.

¹ Maxted N, Avagyan A, Frese L, Iriondo JM, Magos Brehm J, Singer A, Kell SP. 2015. ECPGR Concept for *in situ* conservation of crop wild relatives in Europe. Wild Species Conservation in Genetic Reserves Working Group, European Cooperative Programme for Plant Genetic Resources, Rome, Italy.

² ECPGR. 2017. ECPGR Concept for on-farm conservation and management of plant genetic resources for food and agriculture. European Cooperative Programme for Plant Genetic Resources, Rome, Italy.

2. GRANT SCHEME ACTIVITIES

- **Grant Scheme proposals (submitted: 1; approved: 1)**
 1. [Promoting implementation of national and regional crop wild relative \(CWR\) conservation strategies through sharing of knowledge and experience to create an integrated European strategy for CWR conservation \(CWR Conservation Strategies\)](#) – Second Call (2015)
- **Total number of partners involved: 16 from 14 countries**
 - ECPGR-funded: 12 from 12 countries
 - Self-funded: 4 from 4 countries
- **Meetings held**
 1. Meeting of the Activity “CWR Conservation Strategies”, 19–22 September 2016, Vilnius, Lithuania, jointly with the Nordic project “Ecosystem services: Genetic resources and crop wild relatives in the Nordic countries”.
- **Reports and related data**
 - [Workshop proceedings](#)
 - CWR Conservation Strategies:  [Final Activity Report](#)
 - Journal article: Labokas, J., Maxted, N, Kell, S.P., Magos Brehm, J. and Iriondo, J.M., (2018). Development of national crop wild relative conservation strategies in European countries. *Genetic Resources and Crop Evolution*, (In Press).
- **Funds mobilized**
 - ECPGR granted funds: € 15 000
 - Inputs in-kind declared in Grant activities: (none)

3. OTHER ACTIVITIES (CROSS-WORKING GROUP ACTIVITIES, LINKS WITH OTHER NETWORKS, PROJECTS AND INITIATIVES)

- **Cross-Working Group activities**

Grant Scheme, First Call, inclusion of WS WG members in other WG proposals:

 - With the *Beta* WG: [Genetic diversity of *Patellifolia* species \(GeDiPa\)](#)
 - With the Forages WG: [ECPGR WG for Forages towards 2020s \(Forages 2020\)](#)
 - With all WGs: Networking among Working Groups for discussing and coordinating the implementation of ECPGR objectives (ECPGR Networking)

Links with On-farm Conservation and Management WG (originally belonging to same “*In situ* and on-farm Network”), e.g. Farmer’s Pride project (see below)

- **Others**
 - PGR Secure / EUCARPIA [Enhanced GenePool Utilization – Capturing wild relative and landrace diversity for crop improvement](#). Joint international conference on utilization and conservation of crop wild relative (CWR) and landrace (LR) diversity for crop improvement of the PGR Secure consortium and the European Association for Research on Plant Breeding (EUCARPIA), 17–20 June 2014, NIAB Innovation Farm, Cambridge, UK.

- Nordic project “Ecosystem services: Genetic resources and crop wild relatives in the Nordic countries”: joint meeting with Activity “CWR Conservation Strategies”, 19–22 September 2016, Vilnius, Lithuania.
- Farmer’s Pride
The proposal submitted by the Wild Species Conservation in Genetic Reserves Working Group and the On-farm Conservation and Management Working Group coordinating team (with key additional partners) for H2020 SFS 04 2017 was successful. The project formally starts on the 1st November 2017 and will run for 3 years.
- Nordic CWR project ‘Wild genetic resources – a tool to meet climate change’ 2017-2018. Funding for the project has been received from the Nordic Council of ministers, COP21 cooperation programme. The project has partners from Denmark, Finland, Iceland, Norway and Sweden, some of which are members of the WS WG.
- Bilateral Scientific & Technological Cooperation project between Greece and Slovakia, 2013-2015, funded by national and EU resources. The aims of the project ‘Exploration of cultivated species gene pool for the advancement and improvement of important European crops agronomical characteristics’ was the establishment of a cooperation between the two countries for the conservation of plant genetic resources *in situ* and *ex situ* and the exploration of small-scale applications for *in situ* and on-farm conservation, the implementation of the appropriate methodology for the monitoring of demographic parameters of some target–species of high priority and the development of an effective framework for sustainable protection.
- The German Federal Ministry for Food and Agriculture supported the implementation of CWR concept for *in situ* conservation of CWR and CWR conservation at European level through the following projects and actions:
 - Project: “Genetic reserves for wild celeriac species (*Apium* and *Helosciadium*) as component of a network of genetic reserves in Germany” (2015 – 2019, grant number 2814BM110). The project works with four wild celery species distributed in Germany, suited to enhance the crop breeding pool and classified as threatened. The establishment of a network of 45 genetic reserves is planned.
 - Project: “Identification and conservation of historical grassland areas” (2014 – 2018, grant number 2813BM001), including the establishment of a network of genetic reserves of grassland areas and collecting of grassland species for *ex situ* conservation.
 - Project: “wild fruit trees” (2012 – 2017, grant number 2810BM018) aiming at the conservation and enhancing use of *Ribes alpinum*, *Sorbus aucuparia*, *Juniperus communis*, *Malus sylvestris* und *Pyrus pyraster*.
 - Active participation in the EU preparatory action 2012 – 2016.

4. WORKING GROUP DOCUMENTS AND PUBLICATIONS

Working Group document

Maxted N, Avagyan A, Frese L, Iriondo JM, Magos Brehm J, Singer A, Kell SP. 2015.  [ECPGR Concept for *in situ* conservation of crop wild relatives in Europe](#). (1.4 MB) Wild Species Conservation in Genetic Reserves Working Group, European Cooperative Programme for Plant Genetic Resources, Rome, Italy.

Other Official Reports

- Maxted, N., Kell, S. & Magos Brehm, J., (2014). *Global Networking on in situ Conservation and on-farm Management of Plant Genetic Resources for Food and Agriculture*. Food and Agriculture Organization of the United Nations, Rome, Italy. 14 pp. <http://www.fao.org/3/a-mm537e.pdf>
- Maxted, N., Kell, S. & Magos Brehm, J., (2014). *National Level Conservation and Use of Crop Wild Relatives Draft Technical Guidelines*. Food and Agriculture Organization of the United Nations, Rome, Italy. 14 pp. <http://www.fao.org/3/a-mm542e.pdf>
- Nilsen, L.B., Maxted, N., Mba, C., Dulloo, M.E., Ghosh, K., Magos Brehm, J., Kell, S.P., Diulgheroff, S., Noorani, A. and Furman, B., (2017). Voluntary guidelines for the conservation and sustainable use of crop wild relatives and wild food plants. Food and Agriculture Organization of the United Nations, Rome, Italy. 93 pp. <http://www.fao.org/3/a-i7788e.pdf>

Monograph

- Thormann I, Parra-Quijano M, Endresen DTF, Rubio-Teso M.L, Iriondo M.J, Maxted N. 2014. [Predictive characterization of crop wild relatives and landraces. Technical guidelines version 1.](#) Bioversity International, Rome, Italy.

Conference proceedings

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- Maxted, N., Ehsan Dulloo, M. & Ford-Lloyd, B.V. (eds.) (2016). *Enhancing Crop Genepool Use: Capturing Wild Relative and Landrace Diversity for Crop Improvement*. CAB International, Wallingford, UK. ISBN-13: 978-1-78064-613-8

Books

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- Bioversity International and University of Birmingham. 2017. *Crop wild relative checklist and inventory descriptors v.1*. Bioversity International, Rome, Italy. ISBN-978-92-9255-083-7
- Holubec V. (ed.) (2017). Přehled a popis odrůd zemědělských plodin od počátku československého a českého šlechtění do roku 2000. *Inventory and description of cultivars of agricultural crops since the beginning of Czechoslovak and Czech breeding to the year 2000*. VURV Praha, 498 pp. ISBN 978-80-7427-208-0
- Redden, R., Yadav, S.S., Maxted, N., Dulloo, M.E., Guarino, L. & Smith, P. (Eds.), (2015). *Crop Wild Relatives and Climate Change*, John Wiley & Sons, Inc., Hoboken, USA. ISBN 978-1-118-85433-4.

Journal Articles

- Aguirre-Gutiérrez J, van Treuren R, Hoekstra R. & van Hintum TJL, (2017). Crop wild relatives range shifts and conservation in Europe under climate change. *Diversity and Distributions* 23:739-750.
- Amri, A., Nawar, M., Shehadeh, A., Piggitt, J., Maxted, N. & Gill, B., (2016). *Ex situ and in situ conservation efforts for Aegilops and wild Triticum species*. In: Bonjean, A.P., & W.J. Angus (editors). *The World Wheat Book: a history of wheat breeding, Volume 3*. Pp. 1-48. Lavoisier Publ., Paris.
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- Capistrano-Gossmann G. et al. 2017. Crop wild relative populations of *Beta vulgaris* allow direct mapping of agronomically important genes. *Nature Communications*, 8:15708 (DOI: 10.1038/ncomms15708).
- Castañeda-Álvarez, N.P., de Haan, S., Juárez, H., Khoury, C.K., Achicanoy, H.A., Sosa, C.C., Bernau, V., Salas, A., Heider, B., Simon, R., Maxted, N. & Spooner, D.M., (2015) *Ex situ conservation priorities for the wild relatives of potato (Solanum L. section Petota)*. *PLOS ONE* 10.1371/journal.pone.0122599.

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- Fielder, H., Smith, C., Ford-Lloyd, B. & Maxted, N., (2016) Enhancing the conservation of crop wild relatives in Scotland. *Journal for Nature Conservation*, 29, 51–61.
- Frese, L., Bülow, L., Nachtigall, M., Rubio-Teso, M.L., Duarte, M.C., Rey, E. & Iriondo, J.M. (2017). Genetic diversity of *Patellifolia patellaris* from the Iberian Peninsula, a crop wild relative of cultivated beets. *Euphytica*, 213:187. DOI 10.1007/s10681-017-1942-0.
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- Weibull, J., Fitzgerald, H., Lund, B., Palmé, A. & Þorbjörnsson, H., (2016). Conservation and sustainable use of crop wild relatives: a Nordic initiative. *Journal of the Swedish Seed Association*, 2:53-58. ORCID ID 0000-0001-6480-7960
- Zair, W., Maxted, N. and Amri, A., (2017). Setting conservation priorities for crop wild relatives in the Fertile Crescent. *Genetic Resources and Crop Evolution*, DOI 10.1007/s10722-017-0576-30.

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- Avagyan A., (2017). Gap analysis of national *ex situ* collections to support conservation of genetic diversity of wild cereals. Book of Abstracts of EUCARPIA international conference on *Crop Diversification in a Changing World: Mobilizing the green gold of plant genetic resources*. Montpellier, France, 8–11 May 2017, page 104
- Castañeda-Álvarez, N.P., Khoury, C.K., Sosa, C.C., Achicanoy, H.A., Bernau, V., Vincent, H., Jarvis, A., Struik, P.C. & Maxted N., (2016). The distributions and *ex situ* conservation of crop wild relatives: a global approach. In: Maxted, N., Ehsan Dulloo, M. & Ford-Lloyd, B.V. (eds.), *Enhancing Crop Genepool Use: Capturing Wild Relative and Landrace Diversity for Crop Improvement*. Pp. 87-124. CAB International, Wallingford, UK.
- Dmitrieva S.A., Parfenov V.I., Davidchik T.O. & Savchuk S.S. (2014). Crop Wild relatives of Cereales in the flora of Belarus. *Proceedings of the II International Scientific Conference Held to commemorate the 125th birthday of Evgenia N. Sinskaya*. (9-10 October 2014, St. Petersburg, Russia), St. Petersburg, p. 68.
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5. EXPECTED ADDITIONAL ACHIEVEMENTS AND FUTURE ACTIVITIES

- Full integration of actively conserved population CWR data into EURISCO (Jan 2020)
- Full integration of actively conserved *in situ* population CWR data into AEGIS (Jan 2020)
- *In situ* population management and monitoring software package (Jan 2020)