Interim Technical Report No. 3

For the period January 1, 2023 – June 30, 2023

TITLE of AGREEMENT	CWR in EURISCO
AGREEMENT NUMBER	L21ROM196
IMPLEMENTING PARTNER	Nature Research Centre, Vilnius Akademijos g. 2, LT-08412 Vilnius, Lithuania
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ABSTRACT (Maximum 200 words)	**Identification of priority taxa and populations**. A reiteration of CWR prioritization was carried out, and a list of 144 CWR priority species was established representing 53 genera of food and forage crops belonging to 15 families. Eight new sites were investigated for CWR diversity, increasing the total number of potential genetic reserve sites of CWR populations up to 30. Hotspots of priority CWR occurrences were identified. **Preparation of the national database structure**. The backbone structure of the CWR National Inventory database has been employed to contain (1) information at the taxon level used for the generation of the checklist, and (2) information at the population level to provide specific details about each population. **Organizing the network of data providers**. Nature Research Centre (NRC) and State Forest Service are cooperating in organizing and making operational the network of data providers. It is expected that the individual NRC researchers and/or their groups will provide data through their own related research projects. Global Biodiversity Facility (GBIF) is seen as a significant and regular data provider. Protected area managers and farmers may provide data on project/program and contract basis, respectively. A contribution from such social networking groups as Facebook and iNaturalist is seen effective.
KEYWORDS	Country/Region: Lithuania/Europe. Crop(s): Crop wild relatives for food and agriculture. Subject: Preparation of *in situ* CWR datasets for inclusion in EURISCO.

CWR in EURISCO

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Based on the Principles for the Inclusion of CWR Data in EURISCO (van Hintum and Iriondo, 2022) the following activities were implemented during the third stage of the Project:

1. Identification of priority taxa and populations

A reiteration of CWR species prioritization was carried out according to the criteria specified in the First Interim Technical Report of the project as well as considering the invasive character of some species, like *Lactuca serriola*, *Prunus cerasifera*, and, partly, *Armoracia rusticana*. Prickly lettuce (*L. serriola*) is a particularly rapidly spreading species and invading different natural plant communities, while cherry plum (*P. cerasifera*) pose threat by hybridization with the native species *P. spinosa* (Rašomavičius, pers. comm.; GRIIS). Also, several published data sources from the Nordic countries (Fitzgerald et al., 2018; 2019; Weibull & Phillips, 2020), Czech Republic (Taylor et al., 2017), and the Netherlands (van Treuren et al., 2017) were analyzed to facilitate the process. CWR checklist and inventory data template was employed (Thormann et al., 2017) as well. In the result, 53 genera of food (including culinary herbs, aromatic plants, and berries) and forage species were selected belonging to 15 families. A list of 144 CWR priority species including 135 native and 9 naturalized ones, was generated which still should be considered working version. The summary of the prioritized CWR inventory is presented in Table 1.

Table 1. Summary of the prioritized Lithuanian CWR inventory (ver. 3).

Family	Genera #	Species #	Species %	Genera with numbers of species
Poaceae	19	47	32.6	Agrostis (5), Alopecurus (4), Anthoxanthum (3), Arrhenatherum (1), Avenula (1), Briza (1), Bromus (1), Cynosurus (1), Dactylis (1), Deschampsia (2), Elymus (1), Festuca (8), Glyceria (4), Helictochloa (1), Leymus (1), Lolium (1), Phalaris (1), Phleum (2), Poa (8)
Fabaceae	11	46	31.9	Anthyllis (1), Astragalus (3), Lathyrus (7), Lotus (2), Medicago (2), Melilotus (2), Onobrychis (2), Ononis (1), Securigera (1), Trifolium (14), Vicia (11)
Rosaceae	5	16	11.1	Fragaria (3), Malus (2), Prunus (3), Pyrus (2), Rubus (6)
Lamiaceae	3	6	4.2	Mentha (3), Origanum (1), Thymus (2)
Brassicaceae	2	5	3.5	Barbarea (2), Rorippa (3)
Amaryllidaceae	1	6	4.2	Allium (6)
Ericaceae	1	5	3.5	Vaccinium (5)
Apiaceae	4	4	2.8	Angelica (1), Carum (1), Daucus (1), Pastinaca (1)
Grossulariaceae	1	3	2.1	Ribes (3)
Asparagaceae	1	1	0.7	Asparagus (1)
Asteraceae	1	1	0.7	Cichorium (1)
Betulaceae	1	1	0.7	Corylus (1)
Cannabaceae	1	1	0.7	Humulus (1)
Papaveraceae	1	1	0.7	Papaver (1)
Elaeagnaceae	1	1	0.7	Hippophae (1)
Total: 15	53	144	100	

As seen from Table 1, nearly 2/3 (or 64.5%) of the prioritized species are members of the two families, Poaceae (47 species) and Fabaceae (46 species), the absolute majority of which are forage crop relatives. Regarding legal protection, 17 CWR priority species (11.8%) are protected by the order of the Minister of Environment. These are evaluated according to the IUCN criteria and categories (Table 2).

Table 2. Legally protected CWR species

Species	IUCN categories*
Allium angulosum L.	EN B1ab(ii,iii)+2ab(ii,iii)
Allium scorodoprasum L.	VU A4ac
Allium vineale L.	EN B2ab(iii,iv,v)
Alopecurus arundinaceus Poir.	VU D2
Astragalus danicus Retz.	NT B2b(iii); B1b(iii)
Festuca altissima All.	DD
Festuca psammophila (Čelak.) R. M. Fritsch	EN B1ab(ii,iii,v)+2ab(ii,iii,v)
Glyceria lithuanica (Gorski) Gorski	VU B1ab(iii)+2ab(iii)
Helictochloa pratensis (L.) Romero Zarco	VU D2
Lathyrus laevigatus (Waldst. & Kit.) Gren.	NT B2
Lathyrus pisiformis L.	EN B1ab(iv)+2ab(iv)
Poa remota Forselles	NT B2
Prunus spinosa L.	VU B1ab(ii,iii,v)+2ab(ii,iii,v)
Trifolium lupinaster L.	EN B2b(iii)c(iv)
Trifolium rubens L.	EN B2ab(i,ii,iii,iv)
Vicia lathyroides L.	EN B2b(iii)c(ii)
Vicia pisiformis L.	NT B1+2

* Source: Rašomavičius, 2021.

To identify additional potential CWR populations, the data were collected in May 2023. This included five potential genetic reserve sites with prevailing populations of *Allium ursinum* (records #24 through #28, Appendix 1) and one population with multiple CWR species (#23). Two additional sites with multiple CWR species (#29 and #30) were selected from our earlier observations. The total number of potential sites now amounts to 30 with their sizes varying from 0.22 to 11.76 hectares. These sites contain 80 CWR priority species with the most frequent ones being *Dactylis glomerata* and *Vicia cracca* (each occurring in 21 sites), *Phleum pratense* (18 sites), *Fragaria viridis*, *Poa angustifolia* and *Thymus pulegioides* (each in 16 sites). The least represented populations are those of *Allium angulosum, A. scorodoprasum, A. vineale, Asparagus officinalis, Avenula pubescens, Mentha aquatica, Poa trivialis, Prunus avium, Ribes nigrum, Rubus nessensis, R. plicatus, Trifolium campestre, T, hybridum, Vaccinium myrtillus, V. oxycoccos, V. vitis-idaea, Vicia pisiformis, V. tetrasperma*, each occurring in one single site of the 30 sites investigated. The cover-abundance data of each CWR species estimated on Braun-Blanquet scale is available but not presented in this report. We have grouped the distribution of 80 CWR species across the 30 sites into 5 frequency groups (Table 3).

Table 3. Distribution of 80 CWR priority species across 30 potential CWR genetic reserve sites.

Frequency group	No. of CWR occurrence sites	No. of CWR species	% CWR priority list
1	1–4	43	29.9
2	5–9	17	11.8
3	10–14	10	6.9
4	15–19	8	5.6
5	≥20	2	1.4
Total species in 30 sites		80	55.6
Full priority list (ver. 3)		144	100.0
Total records in 30 sites	504		

As seen from Table 3, the required minimum of 5 populations, as proposed by Dulloo et al. (2008), has not yet been achieved for 43 CWR species, while the minimum of 10 populations, as suggested by Whitlock et al. (2016) for relatively widespread species, has not been achieved for 17 more species.

The selected 30 potential CWR genetic reserve sites were mapped with QGIS showing that they represent all 4 climatic regions and 7 of 10 subregions of the country (Figure 1) and are in protected areas and/or NATURA 2000 sites of Community importance (SCIs) (see Appendix 1).

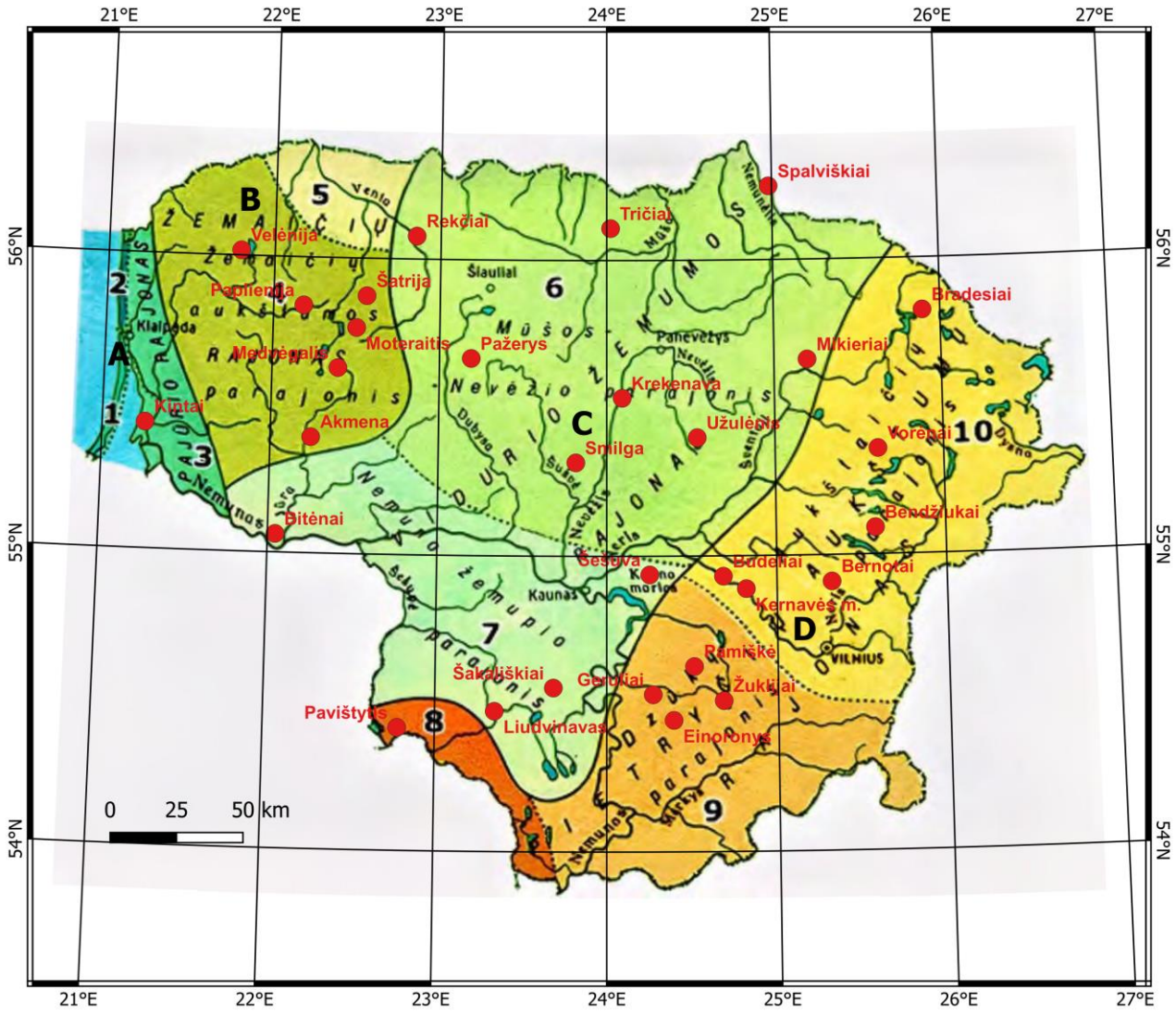

Figure 1. Distribution of 30 potential CWR genetic reserve sites (solid red circles with red labels) in the context of climatic subdivisions of Lithuania as indicated by the Lithuanian Hydrometeorological Service (2015). Climate regions with numbers of subregions: **A** – Pajūrio (Littoral) (**1, 2, 3**); **B** – Žemaičių (Samogitian) (**4, 5**); **C** – Vidurio žemumos (Middle Lowland) (**6, 7**); **D** – Pietryčių aukštumų (Southeast Uplands) (**8, 9, 10**).

As seen from Figure 1, only three climatic subregions (A1, A2, and B5) are not represented by the current study, while subregions C7, D8 and D9 are the least represented ones. These results will be considered while developing the National CWR Inventory database and planning further actions.

2. Preparation of the national database structure

Data sources. The *in situ* CWR National Inventory database has been created by combining target taxa occurrence data from four major datasets: 1) Database of EU habitat mapping in Lithuania (BIGIS); 2) Database of Herbarium of Nature Research Centre (BILAS); 3) Lithuanian Vegetation Database (EU-

LT-001); and 4) Global Biodiversity Information Facility (GBIF). Most of the recent data are contained in BIGIS and GBIF (Table 4). The compiled database can run in both Microsoft Access and QGIS formats. Hotspot analysis of priority CWR occurrences performed with QGIS in 4×4 km grid cells showed that the highest numbers of the target species occurrences (most of the cells with >296 records per 4×4 km cell) are in the western and southern parts of the country (Figure 2), where two thirds of the potential genetic reserve sites are located by scoring approach (see Figure 1).

Table 4. Numbers of occurrences of CWR priority species (ver. 3)* in four databases by time.

	BIGIS	BILAS	EU-LT-001	GBIF	Total
Older than 10 years	0	7673	19	21	7713
Recent data	284264	9	2155	7187	293615
Total	284264	7682	2174	7208	301328

* The numbers refer to 140 out of 144 CWR priority species. No data on *Barbarea stricta, Lathyrus pisiformis, Onobrychis arenaria, Vaccinium microcarpum*.

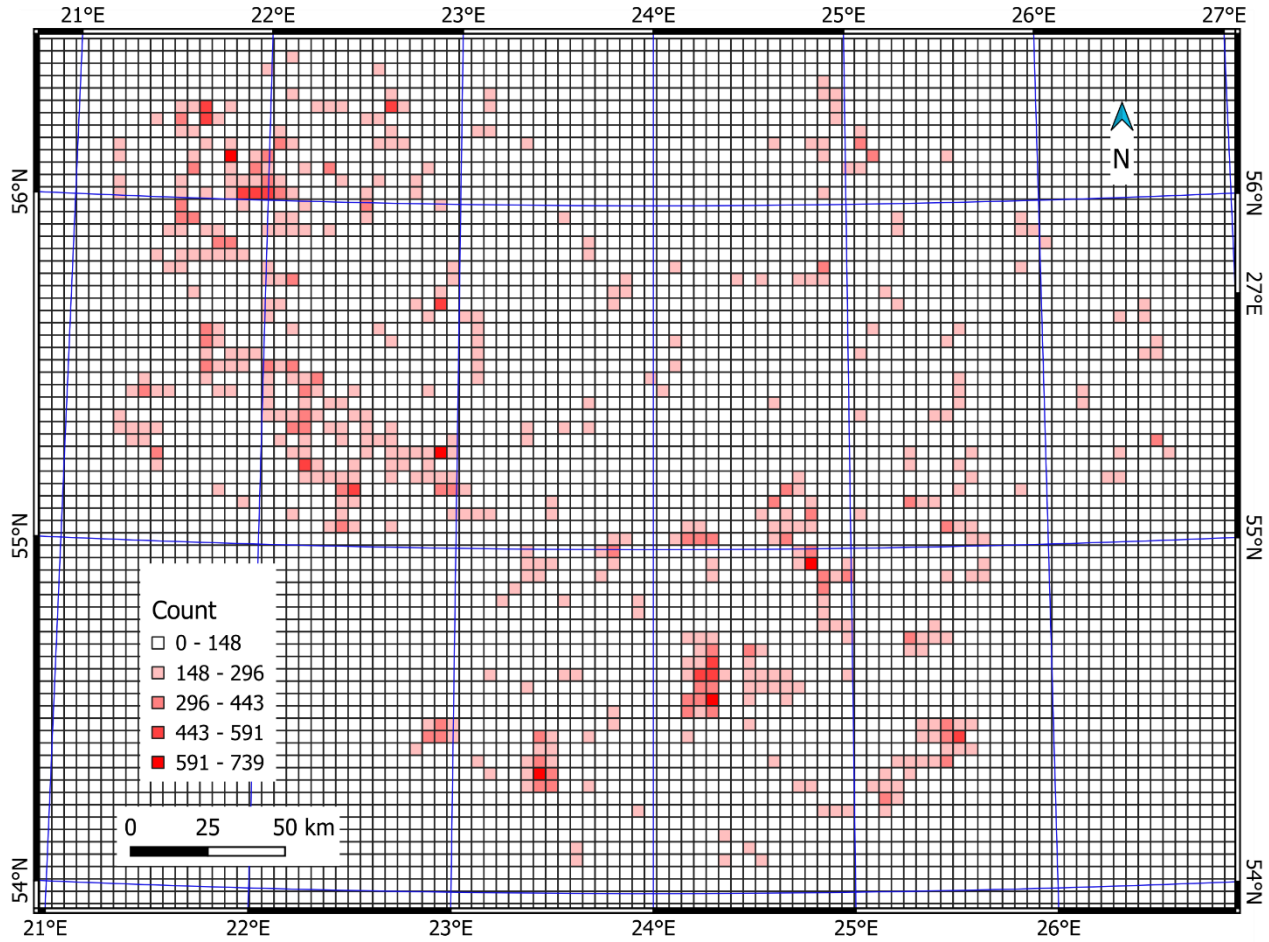

Figure 2. Results of QGIS hotspot analysis of 140 CWR priority species occurrences in 4×4 km grid cells in Lithuania. Data source: working file package at https://drive.google.com/file/d/1Y4ILKKU0o0qGnY-7pCw3yM8JcTZ7zdDt/view

Database structure. There are two types of information tables in the CWR National Inventory database. The first one is taxon level information which consists of Taxon ID, Family, Genus, Species, and Notes. Taxon ID is a unique code which helps to identify taxon and serves as a link between the tables. The Family column contains family name information for each taxon; Genus is the name of genus for each taxon; Species is the scientific name of species; this descriptor is mandatory. To avoid synonyms and ambiguous species names, Euro+Med PlantBase (2006+) is used as a core taxonomic information

system for vascular plants. The second type of information tables provides information at the population level. The descriptors for each population are Population ID, Taxon name, Date, Geographical coordinates, Country, Location name, Grid cell number, Relative abundance, Habitat, Observer or data owner and Primary data source. Population ID is a unique code which helps to identify populations. Taxon name helps to identify specific population; this field takes information from taxon data table. Date is the most recent date the population was observed. Geographical coordinates are latitude and longitude (two separate columns) of location expressed in decimal degrees in WGS-84 coordinate system. Country is the name of the country where the CRW population was observed. Location name could be the name of the forest, lake or river as well as the nearest village or town. Grid cell number is a unique 4-digit code of a cell (approx. 10 x 10 km) where population was observed. Relative abundance usually is the cover (in percentage or Braun-Blanquet scale) of individuals of a taxon in a habitat. Observer or data owner is the name of the person who observed the taxon; if such information is not available, then there will be data owner name. Primary data source is the name of the database from which data was selected. Also, there is a plan to add the third data table with information about each of CWR traits. A snapshot of the data structure and sources is provided in Table 5.

Table 5. Data structure and sources with numbers of occurrences of CWR priority species*

Data structure	**Data source**				**Total**
	BIGIS	**BILAS**	**EU-LT-001**	**GBIF**	
Main data table	284264	7682	2174	7208	301328
Taxon name	+	+	+	+	
Date	+	+	+	+	
Geographical coordinates	+	+	+	+	
coordinateUncertaintyMeters	+	-	+	+	
Country	+	+	+	+	
Location name	-	+	+	+	
Grid cell number	+	+	+	-	
Relative abundance	+	+	+	-	
Habitat	+	+	+	-	
Observer/Data owner	+	+	+	+	
Primary data source	+	+	+	+	
Additional data table					
Family	+	+	+	+	
Genus	+	+	+	+	
Species	+	+	+	+	

* The numbers refer to the occurrences of 140 out of 144 priority CWR species (ver. 3).

3. Organizing the network of data providers

Both Nature Research Centre and State Forest Service will cooperate in organizing the network of data providers and making it operational. Further, a key role should be performed by the individual NRC researchers and their groups through their own research projects. A significant contribution is being obtained through the Global Biodiversity Information Facility (GBIF), particularly with the recent data (see Table 4). Regarding rare and threatened species, the Protected Species Information System (SRIS) of the Ministry of Environment (Lietuvos Respublikos aplinkos ministerija, 2013) will be employed. Moreover, the project on establishing the National Biodiversity Information System at the Ministry of Environment is in progress. Since hosting all biodiversity related data it is deemed useful regarding CWR data as well.

Meanwhile, the protected area managers, mainly botanists and ecologists of the state parks are seen as real in-place collaborators. However, there is a need to establish some corresponding projects or programs, e. g., a long-term species monitoring program, to effectively implement this activity in protected areas. Similarly, effective cooperation with landowners and farmers could be established on contract basis. While some local communities and social networking groups, like Facebook and iNaturalist, could be or already are engaged on voluntary basis. These groups are among the most useful

collaborators. For example, at iNaturalist, currently there could be found 54 observations for *Asparagus officinalis*, 52 for *Ribes nigrum*, 50 for *Angelica archangelica*, 47 for *Mentha aquatica*, 34 for Pyrus pyraster, 16 for *Rubus nessensis*, and so on. Although these observations should be verified, they are valuable sources for the target species distribution data appended continuously. The potential data providers also include representatives from different research institutes and universities, particularly those working in related research fields. For example, the currently running project "Inventory of alien and invasive species in Lithuania" could provide data about status of *Asparagus officinalis*, or the research project on native and alien plant species coexisting on the roadsides could help with collecting data about species occurring in those marginal habitats. The pathway of data should be linked through the newly established Biodiversity information platform (https://biip.lt/) which incorporates the Protected Species Information System (SRIS), or through the Lithuanian vegetation database (EU-LT-001).

4. Collecting and organizing the data according to the agreed principles and data exchange format

In 2023, the data has been collected on 8 potential genetic reserve sites and added to the national CWR inventory (see Section 1 above). Further, we focused on passport descriptors and slightly elaborated some of them. As the potential genetic reserve sites are concrete polygons with such features as area and boundaries, we designated a respective descriptor, site ID, which includes either (a) managing institution abbreviation and a number, e.g., AGB03382, where AGB is an abbreviation of the former Plant Gene Bank (Lith. *Augalų genų bankas*, which has been merged with the State Forest Service), or (b) research institution abbreviation, short date of the first observation (in the format YYMMDD) and a 3-letter site name abbreviation, e.g., NRC200722REK, where NRC stands for Nature Research Centre, and REK indicates the site name Rekčiai). In the former case the site is approved by the Ministry of Environment, and in the latter case approval is pending. Furthermore, as most of the sites are multispecies ones, a separate population ID (POPID) for each of them could be derived based on the site ID by just adding a 6-letter code for species name. For example, the population of *Corylus avellana* from Budeliai site (see record #23, Appendix 1) would be coded as NRC230531BUD_CORAVE (with or without underscore), *Pyrus communis* – as NRC230531BUD_PYRCOM, *Fragaria vesca* – as NRC230531BUD_FRAVES, etc. In general, 8 out of 11 passport descriptors comply with those recommended by the guiding document "Principles for the Inclusion of CWR Data in EURISCO" (see Appendix 1).
The FAO WIEWS was contacted, and the updated INSTCODE of the Nature Research Centre (NRC), was received, which is LTU005.

5. Providing the data to EURISCO

The status of the Lithuanian CWR database reaches its final development stage since the structure of database is created, the list of target taxa compiled and the relations between different data sources are established. The structure of the database contains all mandatory descriptors (NICODE, INSTCODE, ACCENUMB and GENUS) required for the upload to EURISCO, as well as the recommended ones such as SPECIES, POPID (=population ID), OBSDATE (=latest observation date), MNGINSTCODE (=INSTCODE, institution code) and ORIGCTY (country of occurrence). Additionally, there is information available about habitat type, data owner, precise geographical coordinates and cover or abundance of species in a community. Also, there is a possibility to add more attribute data (like soil properties, vegetation structure data, measurements of some plant traits) as the primary data sources, especially the Lithuanian vegetation database (EU-LT-001), contain quite a wide scope of data. The only challenge at this moment is to create or adapt a tool for data management which must be as simple as possible, while being able to handle big data fluently.

Conclusion

Prioritization of CWR taxa could be made based solely on their use in plant breeding of economically important crops. In this case even the invasive species can be prioritized (see, e.g.,

Fitzgerald et al., 2018). However, for the *in situ* conservation some other criteria are preferred, like species nativeness and threat level, to justify CWR conservation in nature and comply with local regulations. The latter concept complies with the actions to mitigate the impact of climate change on plant communities and whole ecosystems. Thus, it is followed by the current project as well.

Two approaches of CWR genetic reserve site selection are being employed parallelly in this project and can complement each other: (1) the old scoring approach based on evaluation of preselected important sites like ancient hillfort sites (which mostly are state protected archaeological objects), sites of community importance (SCI) and national protected areas (30 potential genetic reserve sites have been selected by this way covering 80 species or 55.6% of the CWR priority list), and (2) the database approach based on analysis of several large plant databases for CWR species distribution (multiple hotspots of priority CWR species have been identified by this way covering 140 species or 97.2% of the priority list). Although both approaches have their own advantages and drawbacks, they are useful in selecting the most appropriate CWR population sites for the establishment of the national CWR genetic reserve network and facilitating smooth *in situ* CWR dataset inclusion in EURISCO, which is the ultimate objective of this project.

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Appendix 1. Passport data of potential genetic reserve sites for *in situ* conservation of CWR populations in Lithuania.

#	**Site ID** (base for POPID)	**Managing institution** (MNGINSTCODE/ INSTCODE)	**Site name*** (OCCURSITE)	**Municipality**	**Coordinates** (DECLATITUDE, DECLONGITUDE)	**Year**** (OBSDATE)	**Area***, **ha**	**CWR species**[1] (GENUS, SPECIES)	**Protected area**[2] (SITEPROT)	**Habitat**[3] (POPSRC)	**Climate subregion**[4]
1	AGB03382	State Forest Service	Bitėnai	Pagėgiai	55.06184, 22.04471	2011	8.50	*Allium angulosum* *Allium oleraceum* *Allium scorodoprasum* *Allium vineale* *Fragaria viridis* Total 15	Šilėnai BR, Rambynas RP, next to SCI Ragainės vingis LTSIU0003	6510	C7
2	AGB04376	State Forest Service	Mikieriai	Anykščiai	55.66159, 25.19773	2015	3.80	*Fragaria viridis* *Fragaria vesca* *Medicago falcata* *Poa angustifolia* *Festuca rubra* Total 17	Šventoji LR SCI Šimonių giria LTANYB001 BP Šimonių giria	6210	C6
3	AGB04468	State Forest Service	Kintai	Šilutė	55.42643, 21.25395	2016	2.00	*Rubus plicatus* *Rubus caesius* *Rubus idaeus* *Lotus corniculatus* *Festuca gigantea* Total 15	Kintai BR SCI Kintų pievos ir miškai LTKLA0004	–	A3
4	AGB04828	State Forest Service	Bradesiai	Zarasai	55.82200, 25.89349	2018	3.90	*Trifolium 6 species,* *Dactylis glomerata* *Festuca rubra* *Phleum pratense* *Thymus pulegioides* Total 20	Sartai RP SCI Zalvės upės slėnis LTZAR0028	6210	D10
5	AGB05263	State Forest Service	Krekenava	Panevėžys	55.53415, 24.09143	2019	9.10	*Medicago falcata*	Krekenava RP	6530	C6

									Rubus caesius	SCI Nevėžio vidurupio slėnis LTPAN0012		
									Fragaria viridis			
									Ribes nigrum			
									Poa angustifolia			
								Total	22			
6	AGB05640	State Forest Service	Velėnija	Plungė	56.01676, 21.79567	2020	5.40		*Mentha aquatica*	Žemaitija NP	7140	B4
									Vaccinium oxycoccos	SCI Žemaitijos nacionalinis parkas LTPLU0009		
									Vaccinium myrtilus			
									Vaccinium vitis-idaea			
									Lathyrus pratensis			
								Total	9			
7	AGB05642	State Forest Service	Medvėgalis	Šilalė	55.62770, 22.39278	2020	5.10		*Fragaria vesca*	Medvėgalis HF, Varniai RP	6210, 6510	B4
									Lathyrus sylvestris	SCI Medvėgalio pievos LTSIL0003		
									Origanum vulgare			
									Poa nemoralis			
									Dactylis glomerata			
								Total	16			
8	AGB02968	State Forest Service	Vorėnai	Molėtai	55.35748, 25.60970	2022	0.50		*Festuca rubra*	Vorėnai HF	–	D10
									Medicago falcata			
									Origanum vulgare			
									Trifolium medium			
									Vicia cracca			
								Total	22			
9	AGB04375	State Forest Service	Bernotai	Vilnius Dist.	54.90947, 25.32245	2022	1.50		*Festuca rubra*	Bernotai HF	–	D10
									Medicago falcata			
									Thymus pulegioides			
									Trifolium alpestre			
									Arrhenatherum elatius			
								Total	23			
10	NRC200722REK	Nature Research Centre	Rekčiai	Šiauliai Dist.	56.07736, 22.85350	2020	3.60		*Rubus caesius*	Rekčiai HF, Venta RP	6210, 6510	C6

									Daucus carota	SCI Ventos upės slėnis aukščiau Papilės LTAKM0006		
									Festuca rubra *Thymus pulegioides* *Dactylis glomerata*			
								Total	22			
11	NRC200715SAT	Nature Research Centre	Šatrija	Telšiai	55.87270, 22.55800	2020	10.06		*Fragaria viridis* *Phleum phleoides*	Šatrija HF, Varniai RP SCI Šatrijos pievos LTTEL0010	6210	B4
									Poa angustifolia *Thymus pulegioides* *Trifolium arvense*			
								Total	20			
12	NRC200716PAP	Nature Research Centre	Paplienija	Telšiai	55.83674, 22.17979	2020	10.99		*Poa nemoralis* *Corylus avellana*	Paplienija HF, Minija LR	9180, 6270	B4
									Dactylis glomerata *Elymus caninus* *Festuca gigantea*			
								Total	19			
13	NRC200715MOT	Nature Research Centre	Moteraitis	Telšiai	55.76457, 22.49970	2020	4.40		*Thymus pulegioides* *Fragaria viridis*	Moteraitis HF, Varniai RP SCI Moteraičio pievos LTTEL0009	6210	B4
									Phleum phleoides *Trifolium alpestre* *Trifolium arvense*			
								Total	16			
14	AGB05658	State Forest Service	Pavištytis	Vilkaviškis	54.41533, 22.78184	2021	1.80		*Phleum phleoides* *Dactylis glomerata*	Pavištytis HF, Vištytis RP SCI Pavištyčio pievos LTVIK0003	6210	D8
									Fragaria viridis *Medicago falcata* *Trifolium alpestre*			
								Total	16			
15	NRC210720SAK	Nature Research Centre	Šakališkiai	Marijampolė	54.55398, 23.68895	2021	0.22		*Allium oleraceum*	Šakališkiai HF	6210, 6270	C7

								Poa angustifolia *Thymus pulegioides* *Fragaria viridis* *Medicago falcata*			
							Total	18			
16	NRC210720LIU	Nature Research Centre	Liudvinavas	Marijampolė	54.47420, 23.34622	2021	2.93	*Fragaria viridis*	Liudvinavas HF	6210	C7
								Medicago falcata *Allium oleraceum* *Dactylis glomerata* *Phleum pratense*			
							Total	18			
17	NRC220622TRI	Nature Research Centre	Tričiai	Pakruojis	56.10793, 24.02301	2022	0.39	*Fragaria viridis*	Tričiai HF	–	C6
								Festuca rubra *Medicago falcata* *Fragaria vesca* *Poa angustifolia*			
							Total	19			
18	NRC220727ZUK	Nature Research Centre	Žuklijai	Trakai	54.50982, 24.68262	2022	1.31	*Festuca rubra*	Žuklijai HF, Aukštadvaris RP	6210	D9
								Allium oleraceum *Thymus pulegioides* *Trifolium pratense* *Fragaria vesca*			
							Total	23			
19	NRC220727EIN	Nature Research Centre	Einoronys	Alytus Dist.	54.44435, 24.39077	2022	1.34	*Medicago falcata*	Einoronys HF, Pivašiūnai GMR	–	D9
								Phleum pratense *Trifolium medium* *Festuca rubra* *Festuca pratensis*			
							Total	20			
20	NRC220727GER	Nature Research Centre	Geruliai	Alytus Dist.	24.27053, 54.53128	2022	1.11	*Origanum vulgare*	Geruliai HF	–	D9
								Trifolium medium *Poa angustifolia* *Prunus padus* *Vicia cracca*			
							Total	20			

21	NRC220727PAM	Nature Research Centre	Pamiškė	Trakai	54.62611, 24.51146	2022	1.74	*Festuca rubra* *Thymus pulegioides* *Trifolium alpestre* *Fragaria viridis* *Malus sylvestris* Total 31	Pamiškė HF, Aukštadvaris RP	6210	D9
22	NRC220817BEN	Nature Research Centre	Bendžiukai	Molėtai	55.09028, 25.58466	2022	2.74	*Trifolium medium* *Poa angustifolia* *Pyrus communis* *Phleum pratense* *Malus sylvestris* Total 15	Bendžiukai HF	6510	D10
23	NRC230531BUD	Nature Research Centre	Budeliai	Kaišiadorys	54.93017, 24.68439	2023	10.62	*Corylus avellana* *Pyrus communis* *Prunus padus* *Fragaria vesca* *Fragaria viridis* Total 22	Budeliai LR	–	D10
24	NRC230531SES	Nature Research Centre	Šešuva	Kaišiadorys	54.937222, 24.250261	2023	11.76	***Allium ursinum***[5] *Corylus avellana* *Rubus idaeus* Total 3	Šešuva BR, SCI Būdos ir Pravieniškių miškai LTKAI0005	9020	C7
25	NRC230510AKM	Nature Research Centre	Akmena	Tauragė	55.390246, 22.239336	2023	0.50	***Allium ursinum*** *Corylus avellana* *Prunus padus* *Pyrus communis* *Elymus caninus* *Fragaria vesca* *Lathyrus vernus* *Poa nemoralis* *Rubus idaeus* Total 9	Pagramantis RP	9180	B4
26	NRC230510SMI	Nature Research Centre	Smilga	Kėdainiai	55.315665, 23.816354	2023	1.77	***Allium ursinum***	Smilga municipal LR	–	C6

									Corylus avellana *Lathyrus vernus* *Prunus padus*			
								Total	4			
27	NRC230525SPA	Nature Research Centre	Spalviškiai	Biržai	56.248754, 24.979481	2023	0.50		***Allium ursinum*** *Corylus avellana* *Lathyrus vernus*	SCI Biržų giria LTBIRB001 next to Biržų girios BR	–	D10
								Total	3			
28	NRC230525UZU	Nature Research Centre	Užulėnis	Ukmergė	55.400091, 24.537527	2023	2.36		***Allium ursinum*** *Prunus padus* *Corylus avellana*	SCI Taujėnų-Užulėnio miškai LTUKMB001	–	C6
								Total	3			
29	AGB04237	State Forest Service	Kernavės m.	Širvintos	54.885253, 24.817136	2014	1.50		*Fragaria viridis* *Medicago falcata* *Bromus inermis* *Phleum phleoides* *Poa angustifolia* *Thymus serpyllum*	River protection zone Next to SCI Kernavės apylinkės LTSIR0006	–	D10
								Total	29			
30	AGB05264	State Forest Service	Pažerys	Kelmė	55.667127, 23.187486	2019	2.16		Phleum pratense Deschampsia cespitosa Mentha arvensis Trifolium pratense Anthoxanthum odoratum	SCI Šimšų miškas LTKEL0007	–	C6
								Total	15			
	Total records								**504**			
	Total species								**80**			
	Total SCIs								**16**			

* Site name corresponds to the name of the nearest settlement or landmark (hill, river, lake).
** Year or the last observation.

*** Recommended area size for the genetic reserve.

[1] If total CWR species number per site exceeds 10, the most abundant ones in each CWR site are listed only.

[2] Protected area and Natura 2000 site abbreviations:

BP Biosphere Polygon
BR Botanical Reserve
GMR Geomorphological Reserve
HF Hillfort
LR Landscape Reserve
NP National Park
RP Regional Park
SCI Natura 2000 Site of Community Importance, Habitats Directive. Reference document: https://eur-lex.europa.eu/eli/dec_impl/2023/245/oj

[3] Habitat types according to the Interpretation Manual of European Union Habitats, version EUR 28, 2013 (https://www.mase.gov.it/sites/default/files/archivio/allegati/rete_natura_2000/int_manual_eu28.pdf):

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)
6270 *Fennoscandian lowland species-rich dry to mesic grasslands
6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)
6530 *Fennoscandian wooded meadows
7140 Transition mires and quaking bogs
9020 *Fennoscandian hemiboreal natural old broad-leaved deciduous forests (Quercus, Tilia, Acer, Fraxinus or Ulmus) rich in epiphytes
9180 *Tilio-Acerion forests of slopes, screes and ravines

[4] Climate regions of Lithuania with numbers of subregions:

A – Pajūrio (Littoral) (1, 2, 3)
B – Žemaičių (Samogitian) (4, 5)
C – Vidurio žemumos (Middle Lowland) (6, 7)
D – Pietryčių aukštumų (Southeast Uplands) (8, 9, 10)
For details see: http://www.meteo.lt/en/climate-regions-of-lithuania

[5] Species name in **bold** indicates its absolute prevalence in a site.