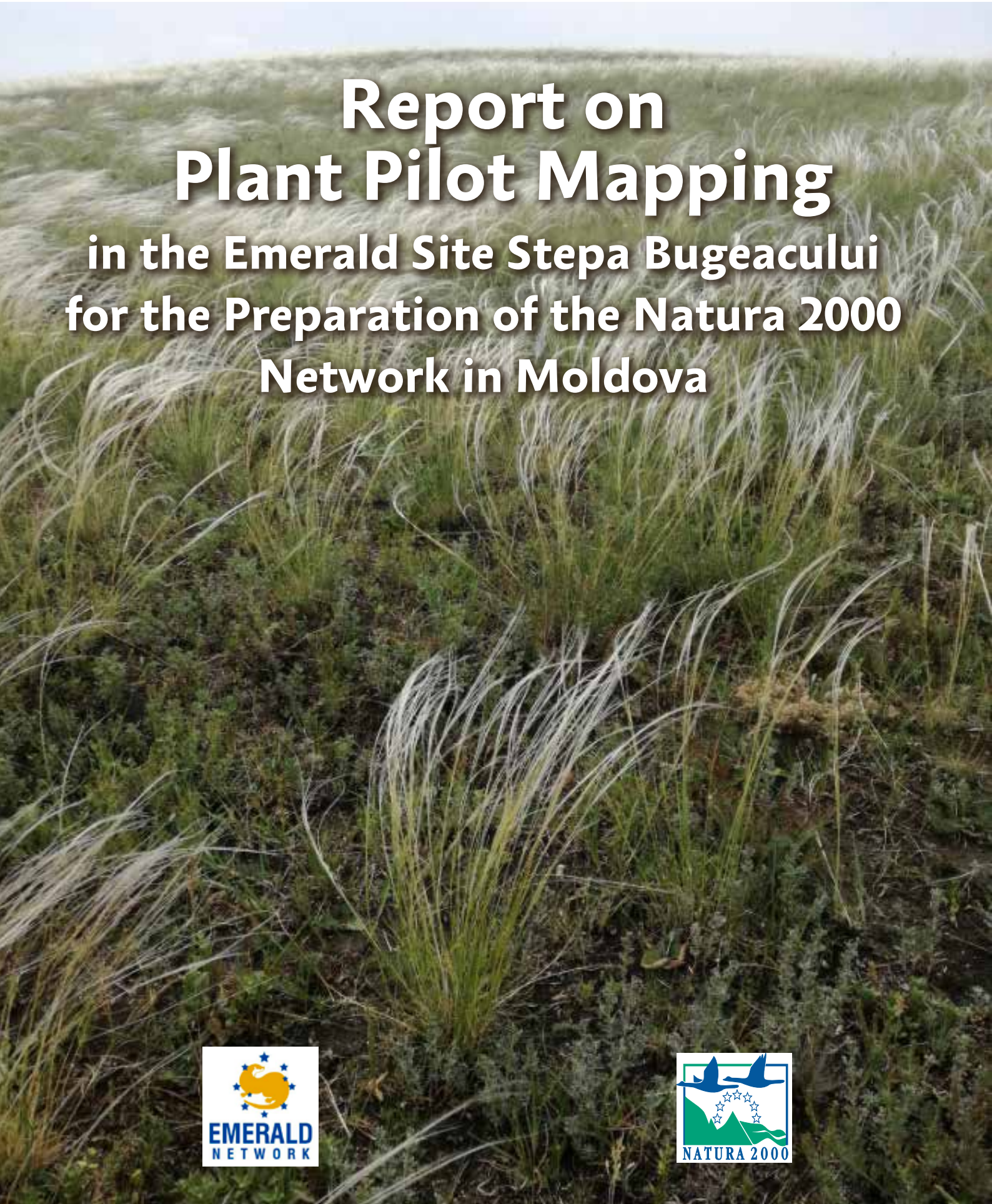
ARNIKA

SOCIETATEA ECOLOGICĂ BIOTICA

TRANSITION
Ministry of Foreign Affairs of the Czech Republic

CZECH AID



Report on Plant Pilot Mapping

in the Emerald Site Stepa Bugeacului for the Preparation of the Natura 2000 Network in Moldova

EMERALD NETWORK

NATURA 2000

Report on Plant Pilot Mapping in the Emerald Site Stepa Bugeacului for the Preparation of the Natura 2000 Network in Moldova
Prague – Chisinau 2025

Published: September 2025

Editor: RNDr. Petr Roth, CSc.
Main Authors: Olga Ionita, Elena Tofan-Dorofeev
Authors: Pavel Pinkava, Shane Hume, Mgr. Oto Kaláb, Ph.D.
Version: On-line
Language Versions: English
Photos (Front/Rear Cover): Olga Ionita
English Proofreading: Shane Hume
Consultation, Technical Support, Production of Maps: Mgr. Oto Kaláb, Ph.D., Faculty of Science, University of Ostrava

The maps used in this report were produced using the help of the mobile application Mergin Maps and QGIS software:
https://merginmaps.com/
https://qgis.org/

ISBN 978-80-88508-70-0

Mapping of the occurrence of three plant species has been conducted within the framework of the project *"Natura 2000 in Moldova: Promoting the European Approach to Nature Conservation in Moldova,"* financed by the Transition Promotion Programme of the Czech Ministry of Foreign Affairs and implemented by Arnika.

Contents

Introduction/Methodology

Mapping Goals:

To test the recording methodology of plant findings by means of the smartphone application (Mergin Maps) in the field, including data transfer and storage.

To specifically map the Emerald site of Stepa Bugeacului (MD00000016) for the three selected plant species (*Crambe tataria, Colchicum fominii, Pontechium maculatum*). Evidence of the exact occurrence of the species as well as the "empty" sites which were visited by the botanists carrying out the mapping, but in which the target species did not occur (or were not found) was done within the whole of this Emerald site.

Tools Used:

Mergin Maps mobile application for field data collection and the software QGIS for data processing.

Species Mapped:

Crambe tataria, Colchicum fominii, Pontechium maculatum

To map the occurrence of these 3 species included in the project, field trips were carried out as follows: in 2024 - 7 days, between August 20 and October 04 (*20.08.2024; 20.09.2024; 22.09.2024; 24.09.2024; 26.09.2024; 03.10.2024; 04.10.2024*). In 2025, field research was carried out for 5 days, between April 15 and June 13 (*15.04.2025; 06.05.2025; 08.05.2025; 14.05.2025; 13.06.2025*). All mapping protocols have been stored and will be available for anyone continuing in mapping of other Bern Convention/EU Nature Directive species *(more information can be found in the Methodology created for this pilot mapping).*

General description of the site "Stepa Bugeacului"

The site "Stepa Bugeacului" is located in the Prut-Dniester interfluve in the southern part of the country; it occupies an area of 49,610 ha and is the second largest Emerald site in the Republic of Moldova. From a territorial-administrative point of view, the site is located on the territory of 5 districts (Cimișlia, Leova, Cahul, Basarabeasca, Taraclia) and on the territory of the territorial-administrative unit of Gagauzia.

The site represents an inhomogeneous territory, limited by slopes with western and southern exposure, and the lower part is adjacent to the valley of the

Ialpug River. The upper parts of the site border private properties used for agriculture. The natural vegetation characteristic of the Bugeac Steppe is represented by sectors with primary steppe plant communities, rich in floristic terms, with an original appearance and a diverse floristic composition, which have been preserved until now only insularly, in small fragments, alternating with agricultural land, pastures, and road networks. The most representative of these steppe fragments, which actually represent the "core area" of the site, are protected at a national level. The valuable vegetation which is under protection on the territory of the "Bugeac Steppe" Emerald site is located mainly in 4 small steppe sites. The approximate location of these sites is shown below in the following figure:

A – "Dezghingea" – 15 ha; **B –** "Bugeac 1" – 4 ha; **C –** "Bugeac 2" – 56 ha; and **D –** "Ciumai" – 52 ha.

These areas fall into the following two categories of national protected areas: Bugeac 2 – natural reserve (Art. 40-42 of Law No. 1538/98), the other three sites - areas with multifunctional management (Art. 50-53 of Law No. 1538/98). Thus, it is found that the area of state-protected natural areas included in the "Bugeac Steppe" site constitutes of only 127 hectares or only 0.25 % of the total area of the Emerald site.

These small areas are rich in floristic terms and contain a large number of rare plant species characteristic of steppe ecosystems. When evaluating the state and composition of the flora and vegetation of these steppe fragments preserved here, it can be seen that, although there is the influence of disturbing factors of a different nature (for example: excessive grazing, attempts to clear land for the purpose of expanding arable land in the vicinity), these areas still

protect and preserve a rich floristic and phytocenotic diversity. The phytocenotic composition is well preserved and is dominated by the species *Stipa lessingiana* and *Stipa ukrainica*, and sometimes, these species play the role of co-edificators, giving way to *Festuca* or *Poa* species. At the same time, the share of weeds in these sectors is small, with a relatively low abundance, with the exception of intensively grazed plots.

These areas, despite various forms of anthropogenic pressure, not only support a diversity of steppe plants, but also ensure the conservation of the populations of many rare species. According to the latest research, the "Bugeac Steppe" site hosts over 400 species of native plants, including species included in the Red Book of the Republic of Moldova, but also species protected at European level such as *Colchicum arenarium*, *Pontechium maculatum* and *Crambe tataria,* the first two of them are listed under the Bern Convention as well as in Annex 2 of the Law on Ecological Network No. 94/07 so that they represent obligatory target species of Emerald sites. In addition, all three species are listed in Annex II of the EU Habitats Directive which means they are obligatory target species of the EU Natura 2000 Network.

Thus, the main aim of this pilot mapping project was to test the methodology and get precise data on the occurrence of all these species – two of them being relevant even now for the current Emerald Network, and all three for the future Natura 2000 Network once Moldova becomes an EU Member State.

General data and mapping results of the species *Colchicum arenarium*

Colchicum arenarium Waldst. et Kit. (=*C. fominii* Bordzil.). A perennial geophyte, ephemeroid, mesoxerophyte of the steppe habitat. In the Republic of Moldova it is protected by the state (Category II - endangered in the region), included in the 3rd edition of the Red Book of the Republic of Moldova as a threatened species (category EN), and also in the Lists of the Bern Convention and in Annex II of the Habitats Directive. *Colchicum arenarium* is characterized by an autumn-spring development rhythm. In July, leaf and flower primordia are formed in the soil, and after 2-2.5 months, in September-October, flowers appear above the ground. The leaves develop only in the following spring. The reproductive organs overwinter in the soil. At the end of winter or the beginning of spring, leaves appear, and a month later, in April, capsules appear. The fruits ripen in May, the seeds being spread by ants and other insects, which are lured by a sweet fleshy appendage. The growing season ends at the end of May.

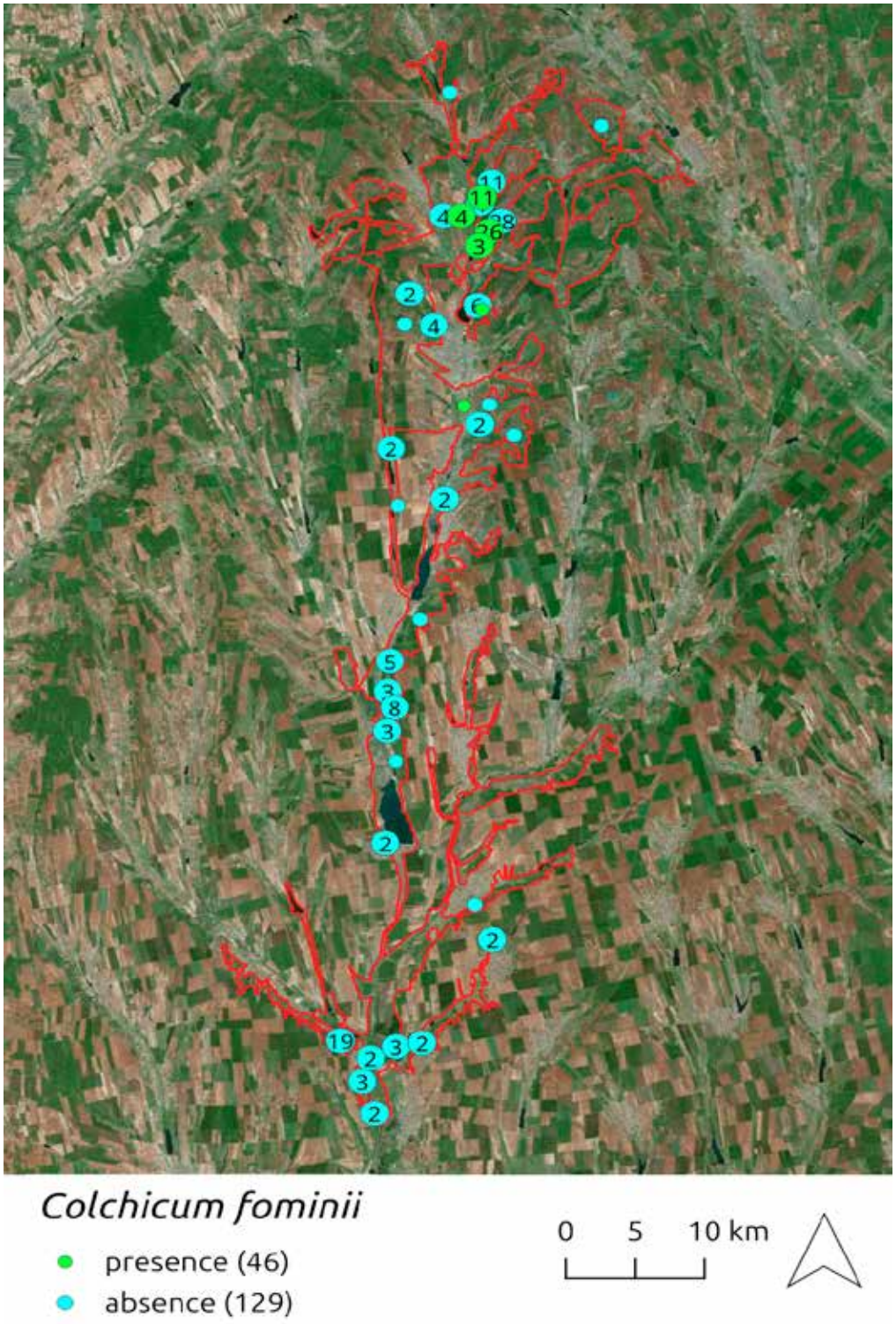
Colchicum arenarium Waldst. et Kit. (=*C. fominii* Bordzil.)

Colchicum arenarium grows in phytocenoses of feather grass with sedge and bearded sedge communities, unevenly distributed, with an abundance of 1-2 on a 5-point scale. A fluctuation in population size is observed from year to year depending on the humidity level of the season; in wet years there is an average of up to 20 individuals per 1m^2, and in dry years the average number of individuals drops sharply.

In the "Stepa Bugeacului" site it was identified both on the steppe surfaces within the site and along the edges of vineyards, abandoned land and roads. From our observations we can conclude that it tolerates soil compaction and trampling by animals well, avoids heavily clogged areas, with deposits of plant mass from previous years and is preserved in secondary bearded sedge communities, in which an increase in the number of specimens is observed, as the herbaceous cover decreases. In the wetter areas at the base of the slopes, plants

form groups larger than 150 specimens. In 2024, the first flowering specimens were identified on September 8 and the flowering period lasted until October 7. The population status is favourable, and the conservation status in the steppe sectors is very good.

During the field trips from 23.08. to 04.10.2024, 46 presence points in sectors A, B and C and 129 absence points of the species *Colchicum arenarium* were mapped and fixed.



Crambe tataria Sebeök

General data and mapping results of the species *Crambe tataria*

Crambe tataria Sebeök – Pannonian-Pontic-Sarmatian species, a steppe mesoxerophyte, typical of stony steppe communities limited to dry limestone slopes of southern exposure, as well as meadow and authentic steppe communities, downy oak forests, meadows and forest edges. In the Republic of Moldova it is protected by the state (Category II - endangered in the region), included in the 3rd edition of the Red Book of the Republic of Moldova as a threatened species (category EN), also found in the Lists of the Bern Convention and in Annex II

of the Habitats Directive. The plant is extremely vulnerable due to its particular biology. It blooms at the age of 2-3 years and later. Polycarpic or monocarpic. From between 2.5 to 10.2 thousand fruits are formed on one plant, but the proportion of underdeveloped seeds is quite high. In addition, they have a low germination rate. Reproduction is predominantly through seeds. Obligatory cross-pollination and severe damage to fruits by phytophagous insects considerably reduce seed productivity.

In the "Stepa Bugeacului" site, it was identified in three of the four "core sectors": "Dezghingea", "Bugeac 1", and "Bugeac 2", located diffusely throughout the surface of the sectors, but also along the edges of vineyards, abandoned land and roads. As a result of our observations, it was found that *Crambe tataria* grows solitarily and in both small groups (2-3 phytoindividuals) and in large groups (15-35 phytoindividuals). In the 2025 vegetation season, the predominance of predominantly generative specimens with a vigorous habitus was noted, most likely due to the favourable conditions in previous years, taking into account the fact that it fructifies in the 2nd - 3rd year of vegetation. In 2025, the first specimens bloomed on April 25, and the flowering period ended approximately on May 24.

The mapping of the *Crambe tataria* species was carried out between August 23 - October 04, 2024, and May 6 - June 13, 2025. During the field trips, 109 presence points in sectors A, B and C and 61 absence points of the *Crambe tataria* species were mapped and recorded during these two periods.

The status of the populations in the habitats mapped with presence points is favourable, and the conservation status in the steppe sectors is very good.

Pontechium maculatum (L.) Böhle & Hilger

General data and mapping results of the species *Pontechium maculatum*

Pontechium maculatum (L.) Böhle & Hilger (= *Echium russicum* J. F. Gmel.) is a biennial species with an erect stem of 25-70 cm, foliated with descending, linear-lanceolate leaves, arranged alternately, with an indument of setiform hairs mixed with short, soft hairs. Inflorescence spicate, composed of short bracteate cymes. Corolla red-burgundy, infundibuliform; corolla tube straight, without

fornix. Stamens and style long-exserted. Nutlets ovoid-trigonous. *Pontechium maculatum* grows in dry grasslands and steppes in southeastern and central Europe, including habitats such as (6210) - Semi-natural dry grasslands and scrub facies on calcareous substrates (Festuco-Brometalia) and (6240) - Sub-Pannonic steppe grasslands, it is included in the Habitats Directive Annex IIb, being therefore a species of "community interest" that the Republic of Moldova will be obliged to conserve within the future Natura 2000 sites on its territory.

In the "Bugeac Steppe" Site it was searched for in all four "core sectors": "Dezghingea", "Bugeac 1", "Bugeac 2" and "Ciumai", but it was identified and mapped with presence points only in the "Bugeac 1" sector. As a result of the monitoring of this species over the past few years, we can say that the numerical strength and population status of *Pontechium maculatum* in the 2025 growing season is unfavourable with an extremely small number of individuals. Thus, on May 6, 2025, only two presence points in sector B were mapped: one with a single flowering specimen and another point with 6 flowering and 4 vegetative specimens.

Although the conservation status of the species' habitats is good, the 2024-2025 growing seasons were unfavourable for the species.

Final Conclusions Regarding the Site

As a result of the evaluation of the entire "Stepa Bugeac" site in the period 2024-2025, we can conclude that the site represents an inhomogeneous territory, and the unaltered sectors are valuable from a phytocenotic point of view, but also from the aspect of protecting rare species, which are predominantly located in the 4 small steppe reserves with a total area of 127 ha: "Dezghingea" - 15 ha, "Bugeac 1" - 4 ha, "Bugeac 2" - 56 ha and "Ciumai" - 52 ha, and that a large part of the site does not present specific habitats for the species *Pontechium maculatum*, *Crambe tataria* or *Colchicum arenarium*. All three species were mapped with presence points only in the "Bugeac 1" sector and no species of interest was mapped with presence points in the "Ciumai" sector.