

Proposals for the Inclusion of Flora and Fauna Species as well as Types of Natural Habitats in the Annexes to the EU Habitats Directive

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Реферат

Марущак О., Куземко А., Безсмертна О., Балашов І., Бондаренко Г., Боровик Л., Бронскова О., Чорней І., Діденко В., Дідух Я., Дребет М., Кавурка В., Кобів Ю., Мойсієнко І., Некрасова О., Русін М., Шаповал В., Шиндер О., Сон М., Драпалюк А. (2026) Пропозиції щодо включення видів флори та фауни, а також типів природних оселищ до додатків Оселищної директиви ЄС

У даній статті проаналізовано біорізноманіття України з метою підготовки пропозицій щодо включення видів флори і фауни та типів природних оселищ до додатків Оселищної та Пташиної директив ЄС. Україна, як одна з найбільших країн Європи, характеризується високим рівнем видового різноманіття, включаючи значну кількість ендемічних видів. В результаті проведення порівняльного аналізу переліків видів з додатків Бернської Конвенції, Оселищної та Пташиної Директив ЄС та Червоної книги України, а також подальшого поетапного алгоритму відбору видів із використанням відкритих баз даних для перевірки їх поширення та використання критеріїв відбору, зазначених для додатків згаданих Директив, було створено та створено список з 63 видів флори і фауни та 4 типів природних оселищ. Показано, що значна частина запропонованих видів пов'язана зі степовими та петрофітними екосистемами. Встановлено, що багато з них є вузькоареальними або перебувають під загрозою зникнення, а також практично не представлені в країнах ЄС. Особливу увагу приділено видам-ендемікам та реліктовим таксонам Понто-Каспійського регіону, а також видам, які є характерними репрезентантами окремих рідкісних типів природних оселищ, що також потребують комплексного підходу до збереження. Запропоновані оселища також мають унікальний характер і не представлені в країнах ЄС. Отримані результати можуть бути використані для гармонізації природоохоронного законодавства України з нормами ЄС.

Ключові слова: біорізноманіття, Оселищна Директива ЄС, Пташина Директива ЄС, рідкісні види, ендеміки, типи природних оселищ, природоохорона

Abstract

This article analyzes the biodiversity of Ukraine with the aim of developing proposals for the inclusion of flora and fauna species, as well as natural habitat types, into the annexes of the EU Habitats and Birds Directives. Ukraine, as one of the largest countries in Europe, is characterized by a high level of species diversity, including a significant number of endemic species. As a result of a comparative analysis of species lists from the annexes of the Bern Convention, the EU Habitats and Birds Directives, and the Red Data Book of Ukraine, followed by a stepwise selection algorithm using open-access databases to verify species distribution and applying the selection criteria specified for the annexes of the aforementioned Directives, a list of 63 species of flora and fauna and 4 types of natural habitats was compiled. It is shown that a substantial proportion of the proposed species is associated with steppe and petrophytic ecosystems. Many of these species are characterized by restricted distribution ranges or are threatened with extinction, and are largely unrepresented within EU Member States. Particular attention is given to endemic species and Pontic–Caspian relict taxa, as well as to species that serve as characteristic representatives of rare habitat types requiring an integrated conservation approach. The proposed habitat types are also unique and not represented within EU countries. The results obtained can be used to support the harmonization of Ukraine's environmental legislation with EU standards.

Keywords: biodiversity, Habitats Directive, Birds Directive, rare species, endemics, natural habitat types, nature conservation

Introduction

Ukraine is the biggest country in Europe with an area of 603 628 km² (5,7% of the territory of Europe), being situated in 4 biogeographical regions (Pannonic, Continental, Steppic and Alpine). Unique geographical position has led to a great variety of biodiversity and number of

species, including endemic ones. For example, the national red list (Red Data Book of Ukraine) consists of 687 animal and 857 plant, fungi, and algae species. Ukraine as a new member of the European Union will greatly enrich the EU biodiversity with a number of unique, often endemic, species of wild flora and fauna, as well as natural habitat types.

This is a standard practice, when a new country, joining the EU, submits additions to the annexes of the Habitats and Birds Directives with representatives of its flora and fauna that meet the necessary criteria for inclusion to these documents and had not been previously presented within the former set of EU countries or were not the target species for protection.

Quite a large number of species listed in the national red list of Ukraine (Red Data Book of Ukraine) (Order of the Ministry of Environmental Protection and Natural Resources of Ukraine ..., 2021 a,b) are not listed neither in the annexes/resolutions of the Convention on the conservation of European wildlife and natural habitats (Bern Convention), nor in the annexes of the Habitats and Birds Directives. Taking into account that this set of species includes a lot of endemic ones and those requiring special conservation measures in Ukraine, along with their compliance with the criteria of the species listed in the above resolutions and annexes, it was assumed that they are potentially suitable or at least worth checking on their suitability for the including to the annexes of the Habitats and Birds directives.

Under the Birds Directive, countries must designate the core breeding, resting and wintering sites for 190 rare or threatened bird species listed in Annex I of the Birds Directive, as well as for certain other migratory bird species.

Annex II of the Birds Directive includes species of birds that may be hunted under the national legislation of the member states of EU. But these activities must take into account the species population level, geographical distribution and reproductive rate throughout the European territory and in accordance with the norms of European legislation related to hunting practices. It should be strictly emphasized that hunting of these species should not jeopardise conservation efforts in their distribution area. The annex has two subsections: Part A — species, that «may be hunted in the

geographical sea and land area where this Directive applies» and Part B — species, that «may be hunted only in the Member States in respect of which they are indicated». This annex has a species list organised in the form of a table to illustrate, which species is allowed to be hunted according to the annex in which member state.

Annex III of the Birds Directive also has two parts. Generally, according to Article I of the Birds Directive, it relates to conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States and covers the protection, management, and control of these species and lays down rules for their exploitation (which applies to birds, their eggs, nests, and habitats). It means, that for all the bird species referred in Annex I, «the sale, transport for sale, keeping for sale and the offering for sale of live or dead birds and of any readily recognizable parts or derivatives of such birds» should be prohibited. Part A of the Annex III indicates species, for which such activities can be allowed «provided that the birds have been legally killed or captured or otherwise legally acquired». And Part B of the Annex III indicates the species, for which «member states can allow within their territory the activities referred to above, making provision for certain restrictions, provided that the birds have been legally killed or captured or otherwise legally acquired».

Under the Habitats Directive, countries must designate sites for over 1000 plant and animal species and 233 habitats. These are listed in the Annexes I «Natural Habitat Types of Community Interest whose Conservation Requires the Designation of Special Areas of Conservation» and II «Animal and Plant Species of Community Interest whose Conservation Requires the Designation of Special Areas of Conservation» of the Habitats Directive respectively.

Annex IV of the Habitats Directive «Animal and Plant species of Community

Interest in Need of Strict Protection» (over 400, including many Annex II species): a strict protection regime must be applied across their entire natural range within the EU, both within and outside Natura 2000 sites.

Annex V of the Habitats Directive «Animal and Plant Species of Community Interest whose Taking in the Wild and Exploitation may be Subject to Management Measures» (over 90 species): Member States must ensure that their exploitation and taking in the wild is compatible with maintaining them in a favourable conservation status.

Today, thanks to the Habitats Directive, Member States have classified over 23 500 Sites of Community Importance (SCIs) across the EU. Together, they cover almost 950 000 km² of land and sea — an area greater than Spain and Sweden put together. The Natura 2000 Network also includes Special Protection Areas (SPAs) classified under the Birds Directive. Collectively these sites are often referred to as «Natura 2000 sites» and are now the largest coordinated network of protected areas anywhere in the world.

Below is the number of natural habitat types and species listed in the annexes to the EU Habitats and Birds Directives and their presence within Ukraine (Table 1).

The above prompted us to analyze the rare endemic flora and fauna of Ukraine,

as well as its endemic habitats, for their compliance with the criteria of the Habitats and Birds Directives in order to prepare proposals for their inclusion in the mentioned annexes.

Materials and Methods

The selection methodology was developed as a general approach for analyzing all annexes of the Habitats and Birds Directives. Therefore, the information below includes all annexes of the Habitats and Birds Directives that contain species of flora and fauna, as well as types of natural habitats. Plant names are given according to the Plants of the World Online resource (<https://powo.science.kew.org/>).

Technical comparing of different conservation lists

When analyzing species of flora and fauna, we followed a set of logical conclusions and algorithms. The general idea was, that first of all we have to pick up those species that ARE listed in Annex I, II and III of the Bern Convention and NOT listed in Annexes II, IV, and V of the Habitats Directive and Annexes I, II, and III of the Birds Directive. This was made by pairwise comparison of lists.

After comparing the mentioned lists (Bern Convention and the Directives), for the chosen species distribution maps were built based on the available bases of records

Table 1. Number of species and habitat types within the Habitats Directive and Birds Directive (within the framework of the aim of this work) for the EU and those of them confirmed for Ukrainian territory

Annex	Number of species/habitat types (total)	Number of species/habitat types (UA)
Annex I, Habitats Directive	233	172
Annex II, Habitats Directive	≈900	162
Annex IV, Habitats Directive	≈400	168
Annex V, Habitats Directive	≈90	39
Annex I, Birds Directive	197	130
Annex II, Birds Directive	84	76
Annex III, Birds Directive	26	21

of wildlife: GBIF, UkrBin, iNaturalist, etc. The species that are widespread across Europe, were also excluded from the list of chosen species. The species presented in several European countries were left in the list at this stage. An example of such a quick check study is shown below (Fig. 1, 2).

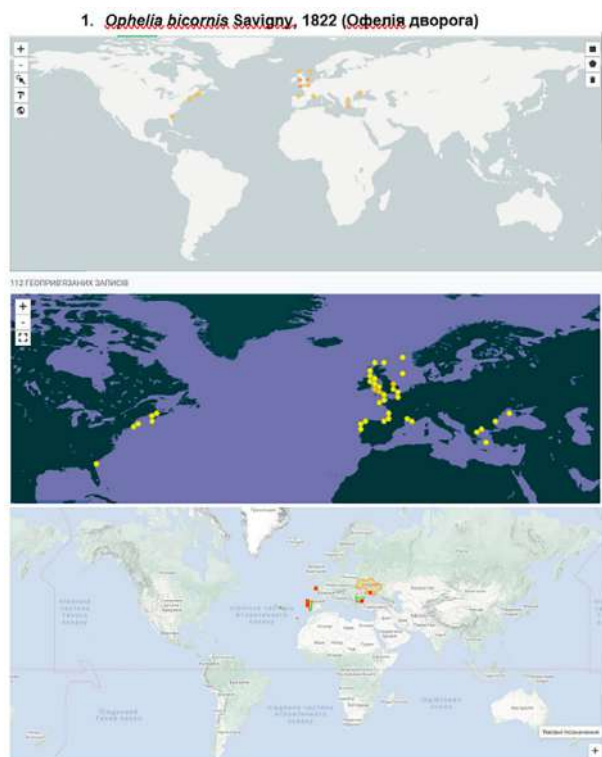


Figure 1. Checking of the geographical distribution of species, chosen at the first stage of technical evaluation of conservation lists in search for species suitable for including to annexes of Birds and Habitats Directives (wild fauna species), according to: A, B — GBIF; C — iNaturalist

At the next step we applied the same algorithm of choosing species as we did for Step No.1. This time, by comparing the protective lists, we picked up those species that ARE listed in Resolution 6 and habitats in Resolution 4 of the Bern Convention and NOT listed in Annexes I, II, IV, and V of the Habitats Directive and Annexes I, II, and III of the Birds Directive. This was made by pairwise comparison of lists. As a result, a certain list of species that are listed in either Annexes I, II or III of the Bern Convention or in Resolution 6 of the Bern Convention and 4 natural habitat types newly proposed and adopted specifically for Ukraine, was formed.

At the final stage, we apply the same algorithm as for the previous two stages, but this time the species listed in the Red Data Book of Ukraine and not listed in Annexes II, IV, and V of the Habitats Directive, Annexes I, II, and III of the Birds Directive, Resolution 6 and Annexes I, II,

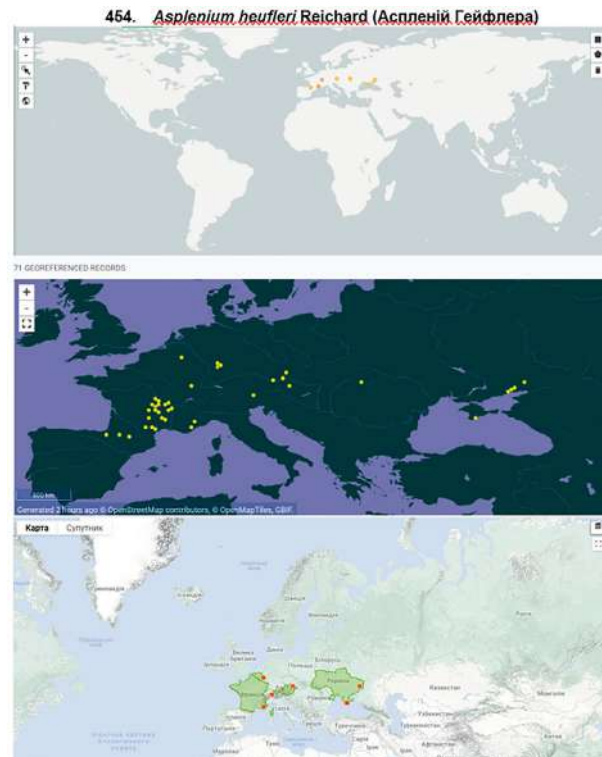


Figure 2. Checking of the geographical distribution of species, chosen at the first stage of technical evaluation of conservation lists in search for species suitable for including to annexes of Birds and Habitats Directives (wild flora species), according to: A, B — GBIF; C — iNaturalist

and III of the Bern Convention, were chosen by pairwise comparison of the lists. For the chosen species distribution maps were built based on the available bases of records of wildlife (GBIF, UkrBin, iNaturalist, etc.). The species that are widespread across Europe, were also excluded from the list of chosen species. The species presented in several European countries were left in the list at this stage.

Therefore, in the period of April—May 2024 an analysis and proposal for the possible inclusion of species and habitats that are relevant and important for Ukraine from the Resolutions 4 and 6 of the Bern Convention to the annexes to

the Habitats and Birds Directives, if they are absent in the EU and are not covered by the current version of the Directives, were made. Filling in the completed forms (their draft versions) on proposed species and habitats to the annexes to the Habitats and Birds Directives in accordance with EU requirements was completed. During this work the following actions took place:

- 1) conducting an analysis of the geographical distribution of wild flora and fauna species from Resolution 6 of the Bern Convention that are not included in Annexes II and IV of the Habitats Directive according to the data from literature and the electronic resources GBIF and iNaturalist;
- 2) conducting an analysis of species listed in the Red Data Book of Ukraine that are not included in Resolution 6 of the Bern Convention, as well as Annexes IV and V of the Habitats and Annexes II and III of the Birds Directives;
- 3) conducting an analysis of species from the lists of regionally rare species of administrative regions of Ukraine regarding their compliance with the criteria of Resolution 6 of the Bern Convention, as well as Annexes IV and V of the Habitats and Annexes II and III of the Birds Directives.

As a result, lists of species, maps of species distribution and justification for the compliance of species with the criteria of the specified annexes were made.

Since all the avian species inhabiting Ukraine are widespread and already included in the annexes of the Birds Directive, no additional avian species were proposed.

After the 3 mentioned steps we obtained a list of 391 wild flora and fauna species that potentially can be proposed for inclusion to the annexes of the Habitats Directive. After receiving such a big list of

species potentially suitable for inclusion to the Habitats Directive, we applied the following set of criteria that would help to narrow the list, giving priority to those species that really need protection in terms of Natura 2000 and practical realization of the future conservation measures.

The main criteria for including species and types of natural habitats in the annexes to the Habitats Directive are defined in Article 1, namely:

«(g) Species of Community interest means species which, within the territory referred to in Article 2, are:

- (i) endangered, except those species whose natural range is marginal in that territory and which are not endangered or vulnerable in the western palearctic region; or
- (ii) vulnerable, i.e. believed likely to move into the endangered category in the near future if the causal factors continue operating; or
- (iii) rare, i.e. with small populations that are not at present endangered or vulnerable, but are at risk. The species are located within restricted geographical areas or are thinly scattered over a more extensive range; or
- (iv) endemic and requiring particular attention by reason of the specific nature of their habitat and/or the potential impact of their exploitation on their habitat and/or the potential impact of their exploitation on their conservation status.

(c) Natural habitat types of Community interest means those which, within the territory referred to in Article 2:

- (i) are in danger of disappearance in their natural range; or
- (ii) have a small natural range following their regression or by reason of their intrinsically restricted area; or
- (iii) present outstanding examples of

typical characteristics of one or more of the nine following biogeographical regions: Alpine, Atlantic, Black Sea, Boreal, Continental, Macaronesian, Mediterranean, Pannonian and Steppic.» (Council Directive 92/43/EEC..., 1992).

In addition to the main criteria, we have proposed the following criteria for inclusion:

- 1) is the species recognizable? The species should be well-identified visually, without the need to provide complicated molecular-genetic studies for its correct identification and not misidentifying with close relative species with similar physical appearance;
- 2) is the species appropriate for territorial / strict protection? The species should benefit from the tools provided by the Habitats and Birds Directives and the defined conservation measures can be practically implemented;
- 3) the species should not be too common to be able to protect it;
- 4) the species should not be data deficient because of long-term lack of experts and monitoring capacities, as the designation of the sites and practical protection would be quite hard.
- 5) the species should have sufficient data about the state of its populations in Ukraine and preferably (if possible) several (sufficient amounts to study the population(s) and collect relevant data about it(them)) experienced experts.
- 6) the decision has to be made whether the species is to be added into Annex IV and which to Annex II.
- 7) Ukraine needs to be able to fulfill reporting obligations (on SDF and art. 17 of the Habitats Directive on conservation status). Also, we need

to consider capacities of the experts for the species that are also necessary for practical implementation issues — management, appropriate assessment etc. (esp. for monitoring).

- 8) the information if the species is present only in Ukraine or also in other member states of the European Union (MS). If the species is present in other MS, it does not automatically disqualify it. Nevertheless, it is something for consideration — it might hinder future approval, as it would impose new requirements of the MS. But some MS might on the other hand welcome the addition of such species.
- 9) also, the future obligations need to be considered: if Ukraine will be able to secure protection of the proposed number of species. It comes with administrative burden — derogations, management planning, appropriate assessment, reporting.
- 10) the species ideally should act as a flagship species and facilitate the protection of habitats.

At this step, the relevant experts (botanists, mammalogists, malacologists, entomologists, herpetologists etc.) that work with the species (chosen at Steps No.1–No.3) were included in the work, having addressed the criteria mentioned above. Following their advice and conclusions, the list of species was greatly reduced.

Results and Discussion

In the list of activities using the criteria listed above had been conducted, the list was narrowed to 63 wild flora and fauna species (Table 2) and 4 natural habitat types (Table 3). Statistics on the species characteristics in terms of their application is shown in the figures below (Figure 3–6).

Part of the chosen habitat types (Fig. 7) and species (Fig. 8, 9) were also offered to be included to the Resolutions 6 and

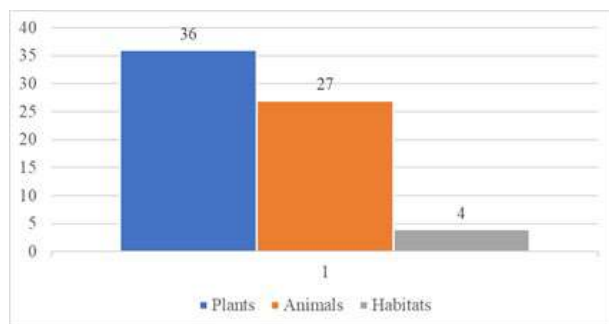


Figure 3. Number of species (by group) and habitat types proposed for inclusion to the Annex I and Annex II of the Habitats Directive.

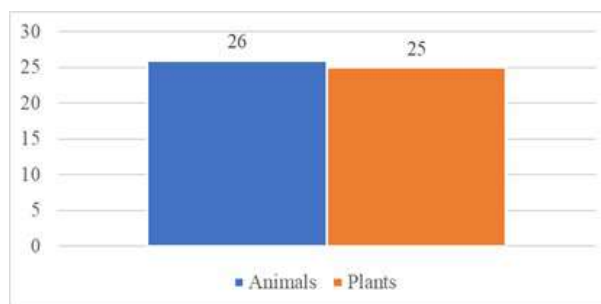


Figure 5. Proportion of higher taxonomic groups (classes) proposed for inclusion to the Annex II of the Habitats Directive (wild fauna species).

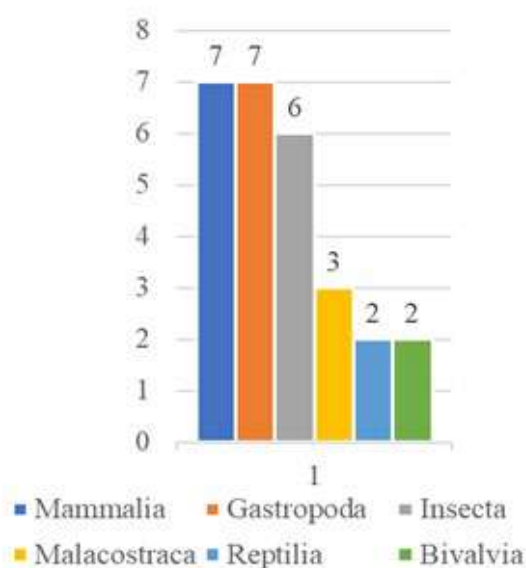


Figure 4. Number of species (by group) proposed for inclusion to the Annex IV of the Habitats Directive.

4 (and therefore Annexes I and II) of the Bern Convention with subsequent filling the same type of forms, but with other heading types, changed according to the purpose of filling.

All detailed suggestions on the species and habitats proposed to be included in the annexes of the Habitats Directive, organized on the basis of the standard form provided for including of new species to the Bern Convention, are provided as supplementary files.

Almost all of the aquatic organisms collected (crustaceans and molluscs) are Pontic-Caspian relicts — species endemic to the estuaries of the Black, Azov, and Caspian Sea basins (Copilaș-Ciocianu & Sidorov, 2022; Gogaladze et al., 2021). The exception is the pond snail *Kazakhlymnaea taurica*, which is a relict of steppe water isolated bodies (Vinarsky et al., 2012).

Of the five proposed terrestrial mollusc species (Table 2), three are endemics to the Crimean Mountains (*Peristoma merduenianum*, *Ramusculus subulatus*, *Vitrea nadejdae*), one is endemic to the Carpathians (*Prostenomphalia carpathica*) and one is distributed around the Black Sea with only several locations in Europe (*Serrulina serrulata*) (Balashov, 2017, 2020).

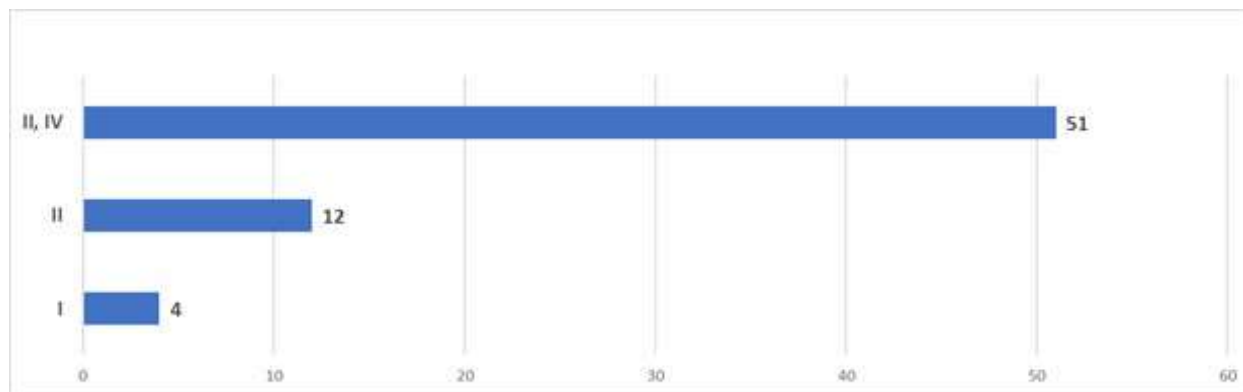


Figure 6. Number of wild flora and fauna species and natural habitat types proposed for inclusion to the Annexes I and II of the Habitats Directive (by Annexes).

Table 2. Wild flora and fauna species proposed to be included to the Annex II of the Habitats Directive: * Res.6 — species already included in Resolution 6 of the Bern Convention, BC — species already included in Appendices I, II or III of the Bern Convention, RBU — species already included in the Red Data Book of Ukraine, Annex — the number of the annex of the Habitats Directive in which the species is proposed to be included; the species are presented in alphabetical order within each kingdom.

N	Species	Kingdom	Class	Vernacular Name	*Res.6	*BC	*RBU	*Annex	UA expert
Fauna									
1	<i>Astacus pachypus</i> Rathke, 1837	Animalia	Malacostraca	рак товстопалий			+	II, IV	Son M.
2	<i>Anadrymadusa retowskii</i> (Adelung, 1907)	Animalia	Insecta	анадримадуза Ретовського			+	II, IV	Kavurka V.
3	<i>Cephalota besseri</i> (Dejean, 1826)	Animalia	Insecta	стрибун Бессера			+	II, IV	Kavurka V.
4	<i>Darevskia lindholmi</i> (Szczerbak, 1962)	Animalia	Reptilia	ящірка Ліндгольма		+		II, IV	Nekrasova O.
5	<i>Desmana moschata</i> (Linnaeus, 1758)	Animalia	Mammalia	хохуля руська	+	+		II, IV	Rusin M.
6	<i>Eremias arguta</i> (Pallas, 1773)	Animalia	Reptilia	ящірка різнобарвна		+		II, IV	Nekrasova O.
7	<i>Hypanis laeviuscula</i> (Eichwald, 1829) (updt. <i>Adacna fragilis</i> (Milaschewitsch, 1908))	Animalia	Bivalvia	бужанка гладенька			+	II, IV	Son M.
8	<i>Hypanis plicata</i> (Eichwald, 1829)	Animalia	Bivalvia	бужанка складчаста			+	II, IV	Son M.
9	<i>Iphigenella andrussowi</i> Sars, 1894 (updt. <i>Lanceogammarus andrussowi</i> (G.O. Sars, 1896))	Animalia	Malacostraca	іфігенела Андрусова			+	II, IV	Son M.
10	<i>Iphigenella shablensis</i> Carausu, 1943 (updt. <i>Shablogammarus shablensis</i> (Cărauşu, 1943))	Animalia	Malacostraca	іфігенела шаблінська			+	II, IV	Son M.
11	<i>Laevicaspia lincta</i> (Milaschewitsch, 1908)	Animalia	Gastropoda	вежка льодяникова			+	II, IV	Son M.

N	Species	Kingdom	Class	Vernacular Name	*Res.6	*BC	*RBU	*Annex	UA expert
12	<i>Lymnaea taurica</i> (Clessin, 1880) (updt. <i>Kazakhlymnaea taurica</i> (Clessin, 1880))	Animalia	Gastropoda	петрик таврійський			+	II, IV	Son M.
13	<i>Nothocrisetulus migratorius</i> (Pallas, 1773)	Animalia	Mammalia	хом'ячок сірий			+	II, IV	Rusin M.
14	<i>Peristoma merduenianum</i> Krynicki, 1833	Animalia	Gastropoda	круглозубка ущелинна			+	II, IV	Balashov I.
15	<i>Poecilimon pliginskii</i> Miram, 1929	Animalia	Insecta	пилкохвіст Плігінського			+	II, IV	Kavurka V.
16	<i>Prostenomphalia carpathica</i> Baidashnikov, 1985	Animalia	Gastropoda	простеном-фалія карпатська			+	II, IV	Balashov I.
17	<i>Pseudochazara euxina</i> (Kusnezov, 1909)	Animalia	Insecta	сатир евксинський			+	II, IV	Kavurka V.
18	<i>Ramusculus subulatus</i> (Rossmassler, 1837)	Animalia	Gastropoda	пелюшниця струнка			+	II	Balashov I.
19	<i>Serrulina serrulata</i> (Pfeiffer, 1847)	Animalia	Gastropoda	серуліна зубчаста			+	II, IV	Balashov I.
20	<i>Spalax arenarius</i> Reshetnik, 1939	Animalia	Mammalia	сліпак піщаний			+	II, IV	Rusin M.
21	<i>Spalax graecus</i> Nehring, 1898	Animalia	Mammalia	сліпак буковинський	+	+		II, IV	Rusin M.
22	<i>Spalax zemni</i> (Erxleben, 1777)	Animalia	Mammalia	сліпак подільський			+	II, IV	Rusin M.
23	<i>Spermophilus pygmaeus</i> (Pallas, 1779)	Animalia	Mammalia	ховрах малий			+	II, IV	Rusin M.
24	<i>Stylodipus telum</i> (Lichtenstein, 1823)	Animalia	Mammalia	ємуранчик звичайний			+	II, IV	Rusin M.
25	<i>Tapinoma kinburni</i> Karawajew, 1937	Animalia	Insecta	тапінома кінбурнська			+	II, IV	Kavurka V.
26	<i>Urophora dzieduszyckii</i> Frauenfeld, 1867	Animalia	Insecta	урофора Дідушицького			+	II, IV	Kavurka V.
27	<i>Vitrea nadejdae</i> Lindholm, 1926	Animalia	Gastropoda	кришталівка кримська			+	II, IV	Balashov I.

N	Species	Kingdom	Class	Vernacular Name	*Res.6	*BC	*RBU	*Annex	UA expert
Flora									
28	<i>Achillea glaberrima</i> Klokov	Plantae	Magnoliopsida	деревій голий	+	+		II, IV	Kuzemko A.
29	<i>Adenophora taurica</i> (Sukaczew) Juz.	Plantae	Magnoliopsida	дзвінка кримська			+	II	Didukh Y.
30	<i>Allium regelianum</i> A.K.Becker	Plantae	Magnoliopsida	цибуля Регеля	+			II	Shapoval V.
31	<i>Astragalus arnacantha</i> M.Bieb.	Plantae	Magnoliopsida	астрagal колючкуватий				II	Didukh Y.
32	<i>Astragalus setosulus</i> Gontsch.	Plantae	Magnoliopsida	астрagal щетинистий	+	+		II, IV	Didukh Y.
33	<i>Centaurea appendicata</i> Klokov	Plantae	Magnoliopsida	волошка великопридаткова			+	II, IV	Didenko V.
34	<i>Centaurea breviceps</i> Iljin	Plantae	Magnoliopsida	волошка короткоголова			+	II, IV	Didenko V.
35	<i>Centaurea konkae</i> Klokov	Plantae	Magnoliopsida	волошка Конки			+	II, IV	Didenko V.
36	<i>Centaurea margaritacea</i> Ten.	Plantae	Magnoliopsida	волошка перлиста			+	II, IV	Didenko V.
37	<i>Crambe koktebelica</i> (Junge) N.Busch	Plantae	Magnoliopsida	катран коктебельський	+	+		II, IV	Didukh Y.
38	<i>Crepis purpurea</i> (Willd.) M.Bieb.	Plantae	Magnoliopsida	скерета пурпурова	+	+		II, IV	Didukh Y.
39	<i>Cymbaria borysthena</i> Pall. ex Schltdl.	Plantae	Magnoliopsida	повстянка дніпровська			+	II	Moysiyenko I.
40	<i>Daphne taurica</i> Kotov	Plantae	Magnoliopsida	вовче лико кримське			+	II, IV	Didukh Y.
41	<i>Daphne sophia</i> Kalenicz.	Plantae	Magnoliopsida	вовче лико Софії			+	II, IV	Bondarenko H.
42	<i>Dianthus hypanicus</i> Andr.	Plantae	Magnoliopsida	гвоздика бузька	+	+		II	Shynder O.
43	<i>Eremogone cephalotes</i> (M.Bieb.) Fenzl	Plantae	Magnoliopsida	пустельниця головчаста			+	II, IV	Moysiyenko I.
44	<i>Erodium beketoii</i> Schmalh.	Plantae	Magnoliopsida	грабельки Бекетова			+	II, IV	Bronskova O.
45	<i>Erysimum ucranicum</i> J.Gay	Plantae	Magnoliopsida	жовтушник український				II, IV	Bondarenko H.
46	<i>Genista tetragona</i> Besser	Plantae	Magnoliopsida	дрік чотиригранний	+	+		II, IV	Moysiyenko I.

N	Species	Kingdom	Class	Vernacular Name	*Res.6	*BC	*RBU	*Annex	UA expert
47	<i>Gymnospermium odessanum</i> (DC.) Takht.	Plantae	Magnoliopsida	оставник одеський			+	II	Moysiyenko I.
48	<i>Hedysarum ucrainicum</i> Kaschm.	Plantae	Magnoliopsida	солодушка українська				II, IV	Borovyk L.
49	<i>Heracleum ligusticifolium</i> M.Bieb.	Plantae	Magnoliopsida	борщівник лігустиколистий			+	II, IV	Didukh Y.
50	<i>Hyacinthella pallasiana</i> (Steven) Losinsk.	Plantae	Magnoliopsida	гіацинтик Палласів			+	II	Bronskova O.
51	<i>Lepidium turczaninowii</i> Lipsky	Plantae	Magnoliopsida	хрінниця Турчанинова	+	+		II	Didukh Y.
52	<i>Moehringia hypanica</i> Grynj & Klokov	Plantae	Magnoliopsida	мерингія бузька	+	+		II, IV	Shynder O.
53	<i>Gymnadenia carpatia</i> (Zapał.) Teppner & E.Klein	Plantae	Magnoliopsida	чорнянка карпатська			+	II, IV	Chorney I.
54	<i>Phalacrachena inuloides</i> (Boiss.) Iljin	Plantae	Magnoliopsida	лисонасінник омановий				II	Shapoval V.
55	<i>Rhaponticoides taliewii</i> (Kleopow) M.V.Agab. & Greuter	Plantae	Magnoliopsida	волошка Талієва				II, IV	Bronskova O.
56	<i>Saussurea porcii</i> Degen	Plantae	Magnoliopsida	соссюрея Порціуса			+	II, IV	Kobiv Y.
57	<i>Sedum borissovae</i> Balk.	Plantae	Magnoliopsida	очиток Борисової				II, IV	Shynder O.
58	<i>Silene cretacea</i> Fisch. ex Spreng.	Plantae	Magnoliopsida	смілька крейдова	+	+		II, IV	Bondarenko H.
59	<i>Silene jailensis</i> N. I. Rubtzov	Plantae	Magnoliopsida	смілька яйлинська				II, IV	Didukh Y.
60	<i>Sobolewsia sibirica</i> (Willd.) P.W.Ball	Plantae	Magnoliopsida	соболєвськія сибірська			+	II, IV	Didukh Y.
61	<i>Steveniella satyrioides</i> (Spreng.) Schltr.	Plantae	Magnoliopsida	стевенієла сатириєподібна	+	+		II, IV	Kuzemko A.
62	<i>Trinia biebersteinii</i> Fedor.	Plantae	Magnoliopsida	тринія Біберштейна			+	II	Didukh Y.
63	<i>Tulipa suaveolens</i> Roth	Plantae	Magnoliopsida	тюльпан Шренка			+	II	Moysiyenko I.

Table 3. Natural habitat types proposed to be included in the Annex I of the Habitats Directive: *Res.4 – habitat type already included in Resolution 4 of the Bern Convention, Annex – the number of the annex of the Habitats Directive in which the habitat type is proposed to be included.

N	Habitat name	*Res.4	Description available	*Annex	UA expert
1	Continental dry rocky steppic grasslands and dwarf scrub on chalk outcrops	+	https://eunis.eea.europa.eu/habitats/5795	I	Kuzemko A.
2	<i>Pinus sylvestris</i> forest on chalk in the steppe zone	+	https://eunis.eea.europa.eu/habitats/8008	I	Kuzemko A.
3	Depressions (pody) of the Steppe zone	+	https://eunis.eea.europa.eu/habitats/8009	I	Kuzemko A.
4	Woods of Dnipro birch, pedunculate oak and aspen on sandy terraces of the Steppe zone	-	Kuzemko et al., 2018	I	Kuzemko A.

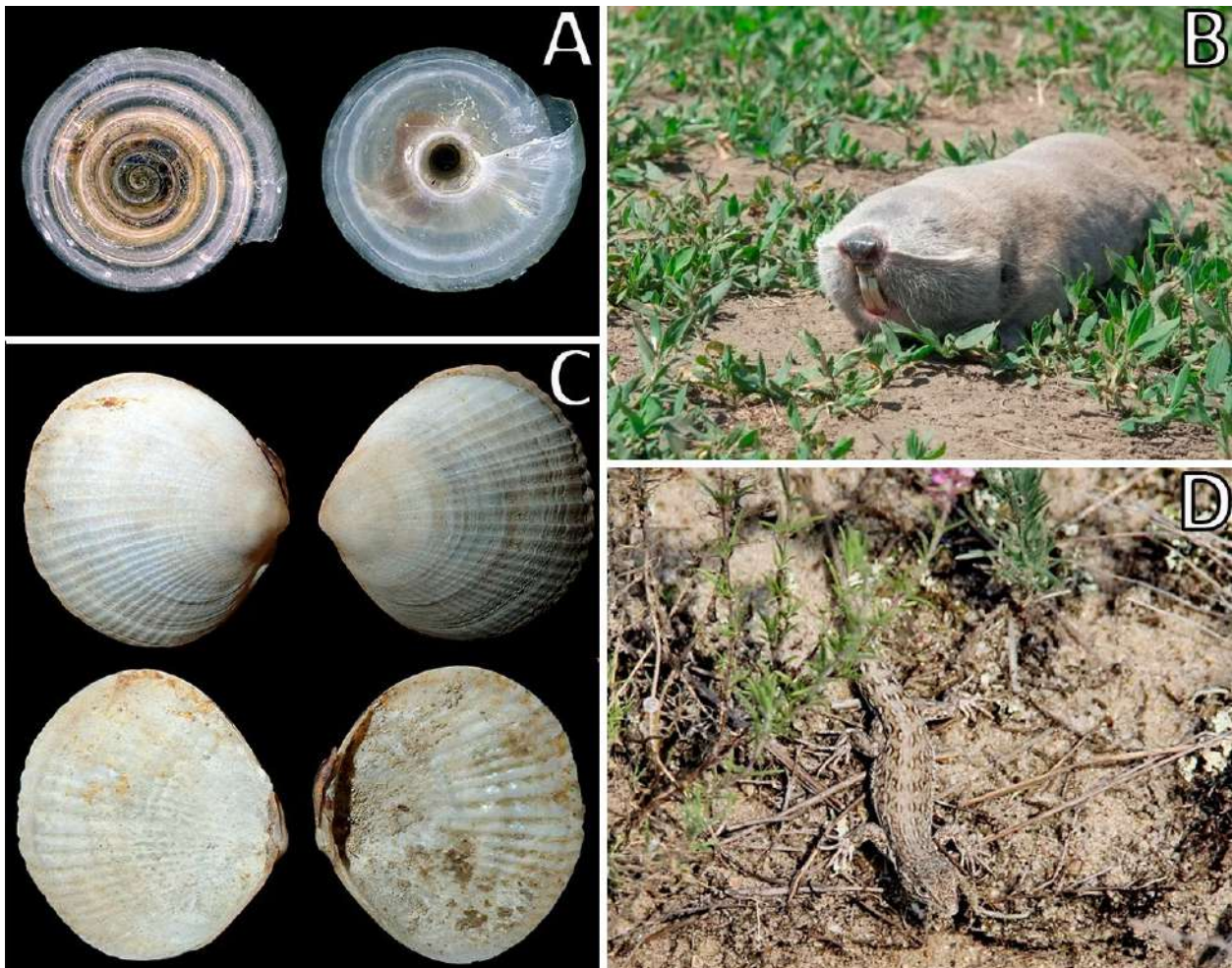


Figure 7. Examples of proposed wild fauna species : A – *Vitrea nadejdae* (photo by Igor Balashov); B – Podolian blind mole-rat *Spalax zemni* (photo by Mykhailo Rusin); C – *Adacna fragilis* (photo by Mykhailo Son); D – steppe runner *Eremias arguta* (photo by Oksana Nekrasova).

Of the six proposed insect species (Table 2), three are endemic to the Crimean Peninsula (*P. pliginskii*, *A. retowskii*, and

P. euxina), distributed along the Southern Coast of Crimea and in the Crimean Mountains (Çıplak et al., 2024; Kusnezov,

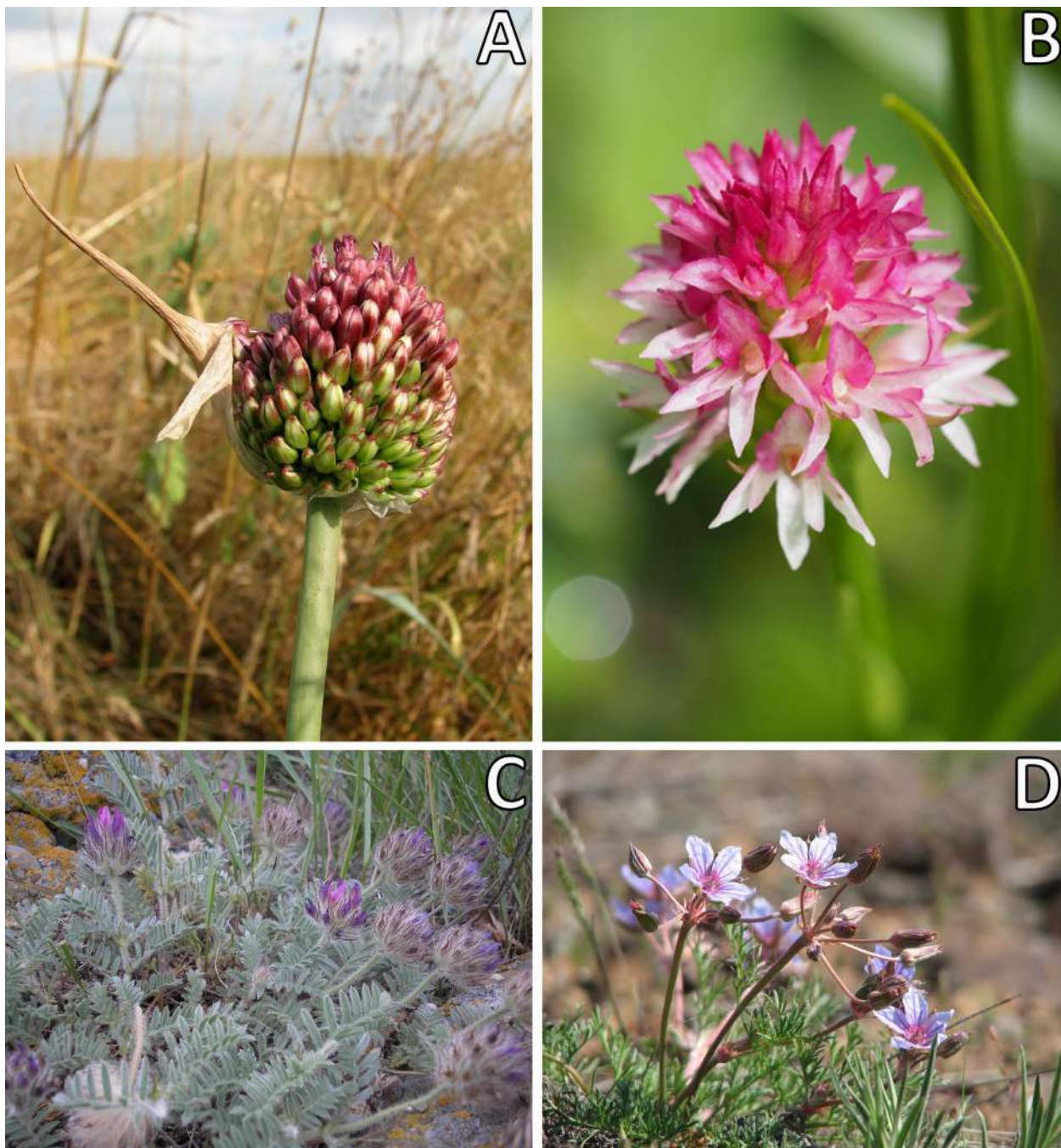


Figure 8. Examples of proposed wild flora species: A – Regel's onion *Allium regelianum* (photos by Ivan Moysiienko); B – Carpathian vanilla orchid *Nigritella carpatica* (photo by Ivan Moysiienko); C – bristly milkvetch *Astragalus setosulus* (photo by Yakiv Didukh); D – *Erodium beketowii* (photo by Olena Bronskova).

1909). *Cephalota besseri* is a Mediterranean species distributed across South-Eastern Europe (Romania, Southern Ukraine, and Russia), Western and Northern Kazakhstan, and Southern and Western Siberia; it prefers salt marshes and solonchaks with sparse halophytic vegetation (Putchkov, Brygadyrenko, 2022; Putchkov et al., 2021). *T. kinburni* is a species that lives on sandy and limestone steppe areas with sparse vegetation; for a long time, it was considered

endemic to certain regions of southern and eastern Ukraine, but was recently recorded in the Belgorod, Rostov, and Voronezh regions of Russia, as well as in Moldova (Seifert et al., 2024). *Urophora dzieduszyckii* is a species known from Ukraine, Turkey, Israel, and Syria; on the territory of Ukraine, it was considered extinct for 150 years until it was rediscovered in July 2016 near its type locality in the Ternopil Region. In Ukraine, *U. dzieduszyckii* is

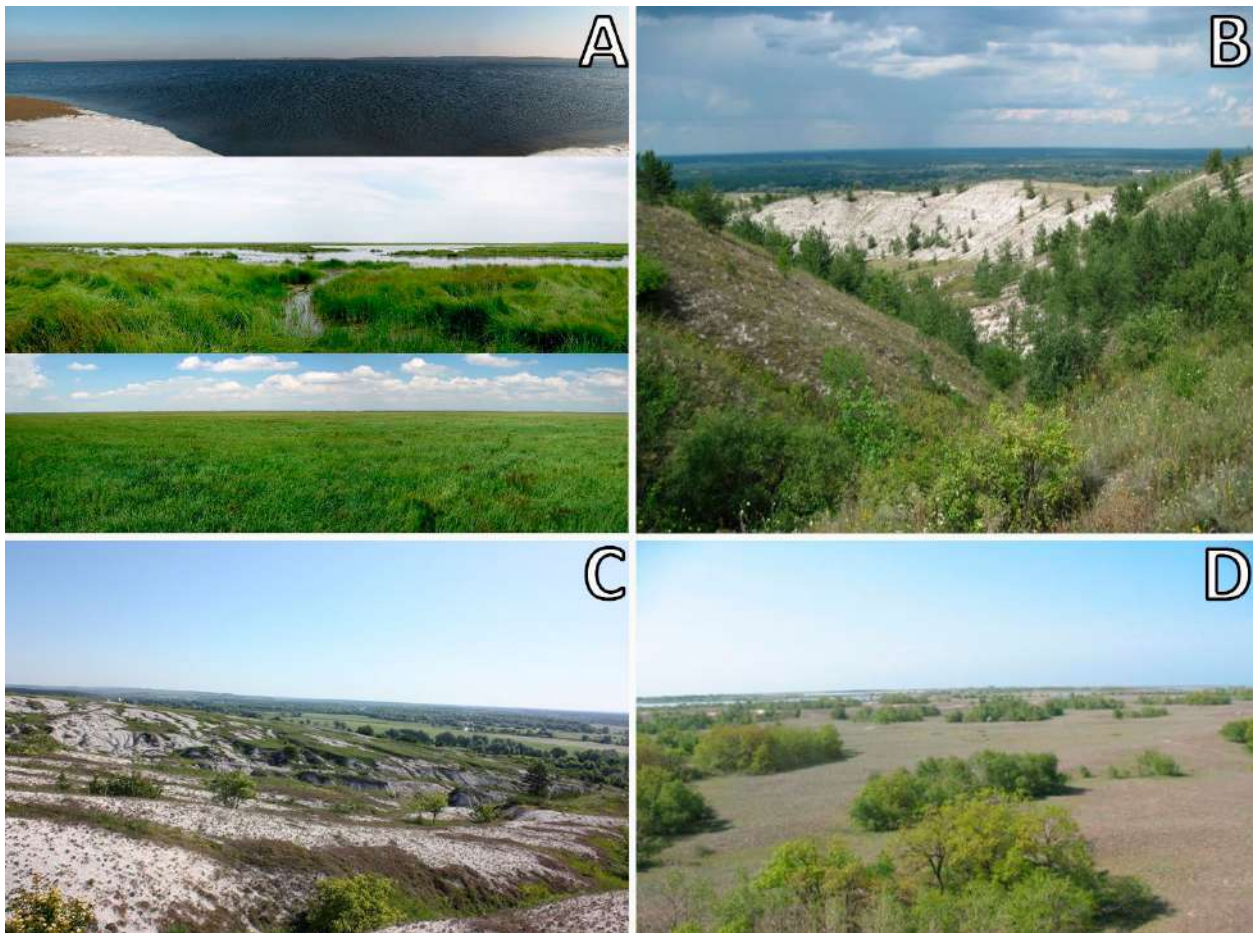


Figure 9. Proposed natural habitat types: A — Depressions (pody) of the Steppe zone (at different stages of existence) (photos by Viktor Shapoval); B — *Pinus sylvestris* forest on chalk in the steppe zone (photo by Yakiv Didukh); C — Continental dry rocky steppic grasslands and dwarf scrub on chalk outcrops (photo by Anna Kuzemko); D — Woods of Dnipro birch, pedunculate oak and aspen on sandy terraces of the Steppe zone (photo by Ivan Moysiienko).

found on unplowed meadows exclusively on host plants (*Echinops* spp.), particularly on *E. exaltatus* Schrad. in the Ternopil, Khmelnytskyi, and Chernivtsi regions within the Dnister canyon and its tributaries (Korneyev et al., 2021).

Such species as *Eremias arguta* inhabit open sandy habitats, including psammophytic steppes, dunes, sandy river terraces, and other dry, well-insolated sites with sparse vegetation (Fig. 7). (Tarashchuk, 1959; Shcherbak, 1966, 1974). *Darevskia lindholmi* is an endemic species of Crimean Peninsula, where it inhabits a diverse range of petrophilous habitats. The typical habitats for both lizards are increasingly threatened.

Seven species of mammals are proposed to be added to the Habitats Directive. Two species are endemic to Ukraine.

Podolian mole rat (*Spalax zemni*) has a current distribution from Mykolaiv to Zaporizhzhia, Dnipro, and Kropyvnytskyi regions with the only isolated population known on Kasova Hora in Ivano-Frankivsk Region (Rusin et al., 2024). Sandy mole rat (*S. arenarius*) is a sibling species to the *S. zemni* and is separated from the latter by the Dnipro river. It occupies a narrow stretch from the town of Kakhovka to the town of Skadovsk in now occupied parts of Kherson Region, as well as on Kinburn Spit within Mykolaiv Region (also currently occupied). This species is susceptible to military activities in the region.

Three mammalian species may be found in Ukraine and further eastwards. Russian desman (*D. moschata*) in Ukraine once was a widespread species from the Dnipro to the eastern borders, but now is only preserved

in the Seim river. Outside of Ukraine it has scattered populations in Russia and Kazakhstan, where it is also a protected species (Rutkovskaya et al., 2024). A thick-tailed three-toed jerboa (*Stylodipus telum*) has an isolated subspecies in Ukraine — *Stylodipus telum falzfeini* (Rusin, 2023). This subspecies is found solely on Lower Dnipro Sands in Kherson and Mykolaiv Regions (now occupied and turned into a war zone). In Ukraine, the pygmy ground squirrel (*Spermophilus pygmaeus*) was historically distributed from the Dnipro River to the east. In the past 20 years, most populations in continental Ukraine were wiped out, and only a handful of populations still survive in the Crimea (observations from iNaturalist).

Two mammalian species are also present in EU27, yet populations of those are in poor condition in every European country. The grey dwarf hamster (*Nothocricetulus migratorius*) has two living records in Romania (Anitei, Petrovan, 2022), and no living records neither in Bulgaria nor Greece. In Ukraine it is sporadically present in Odesa, Mykolaiv, Kherson, Zaporizhzhia regions and the Crimea. Isolated findings come from Luhansk, Dnipropetrovsk, and Poltava regions. The Bukovina blind mole rat (*S. graecus*) is distributed solely in a small region of Romania and Ukraine. There are six modern localities in Romania (Chișamera et al., 2014) and a single one in Ukraine near the city of Chernivtsi.

Among the 36 plant species proposed for inclusion in the Annexes of the Habitats Directive, the vast majority are distributed in southern Ukraine (13 species), Crimea (12 species), and the southeast (9 species), while only 2 species represent the Carpathian region. 17 species are endemic to Ukraine, including 10 local endemics of the south (e.g., *Centaurea appendicata*, *Centaurea margaritacea*, *Moehringia hypanica*, *Sedum borissovae*) and the southeast (*Achillea glaberrima*, *Erodium beketowii* etc.), primarily within the Steppe biogeographical region, and 8 species are

endemic to Crimea (e.g., *Daphne taurica*, *Lepidium turczaninowii*, *Silene jailensis*, *Sobolewsia sibirica*) (Yena, 2001; Didukh, 2009). The remaining species also occur in other countries; specifically, four species are recorded in EU member states — Romania (*Gymnadenia carpatica* *Saussurea porcii*, and *Gymnospermium odessanum*) and Bulgaria (*Genista tetragona*) — though their localities are mostly already included in Natura 2000 sites (Chorney, 2009; Bobocea et al., 2020, Kobiv et al., 2007; Mátiş et al., 2014, Doroftei, Mierla 2007, Stoyanov 2014). Two species are also found in Moldova (the aforementioned *Genista tetragona* and *Gymnospermium odessanum*), one species (*Steveniella satyrioides*) in the Caucasus and Turkey, and another 11 species (*Allium regelianum*, *Cymbaria borysthenica*, *Hyacinthella pallasiana*, *Tulipa suaveolens* etc.) are also distributed within the territory of the aggressor state (Didukh, 2009). Notably, the habitats of the vast majority of these species are rocky outcrops, including granites (e.g., *Achillea glaberrima*, *Moehringia hypanica*), limestones (*Crepis purpurea*, *Lepidium turczaninowii*), chalks (*Daphne sophia*, *Silene cretacea*), and screes (*Crambe koktebelica*, *Sobolewsia sibirica*), as such habitats specifically promote local endemism (Peregrym, 2016, Gryn, Klovov, 1950, Yena, 2012, Banik et al., 2007, Didukh, 2009). The remaining species are also associated with vulnerable habitats, such as steppes (e.g. *Cymbaria borysthenica*, *Hyacinthella pallasiana*), sands (*Centaurea appendicata*, *Centaurea breviceps*, *Centaurea konkae*, *Centaurea margaritacea*), calcareous fens (*Saussurea porcii*), and pody depressions (*Phalacrachena inuloides* and *Allium regelianum*) (Kolomiets et al., 2021, Kuzemko et al., 2022, Kunets, 2010, Moysiienko et al., 2014, Kobiv et al., 2007, Shapoval, Kuzemko, 2021).

All four habitat types proposed for inclusion in Annex I of the Habitats Directive are distributed in eastern Ukraine (Continental dry rocky steppic grasslands and dwarf scrub on chalk

outcrops and *Pinus sylvestris* forest on chalk in the steppe zone) or southern Ukraine (Depressions (pody) of the Steppe zone and Woods of Dnipro birch, pedunculate oak and aspen on sandy terraces of the Steppe zone) (Kuzemko et al., 2018). Apart from Ukraine, all of them occur exclusively within the territory of the aggressor state and have no analogues in EU member states. A number of vascular plant species included in this proposal are specifically associated with these habitats.

Given that all the habitats and the vast majority of vascular plant species included in this proposal are distributed throughout the Steppe biogeographical region—which, among EU countries, is represented only in Romania—ensuring their protection within the Natura 2000 network is of exceptional importance for their conservation on a global scale. It should also be emphasized that a significant portion of the localities for these species and habitats currently fall within territories temporarily occupied by Russia or in combat zones, which threatens their continued existence across the entire European continent.

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Conclusions

In terms of this report a set of 63 wild flora and fauna species are proposed to be included in the Annex II of the Habitats Directive and 4 natural habitat types are proposed to be included in the Annex I of the Habitats Directive. Approving of the suggested lists will allow to increase the representativity of wild species of flora and fauna and types of natural habitats within the reporting process under the respectful articles of the Directives.

The report is accompanied with 67 standard forms for inclusion of new wild flora and fauna species and natural habitats to the Annexes I and II of the Habitats

Directive (each form is filled in both: in English and in Ukrainian); additionally the report provides 51 for inclusion of new wild flora and fauna species and natural habitats to the Resolutions 4 and 6 of the Bern Convention (each form is provided once: in English) (Analysis and proposals for supplementing species/natural habitats..., 2026).

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