

Impact of war on natural environment of the Carpathians in Ukraine



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Cover photos:

- (1) Carpathian Biosphere Reserve, Zakarpattia Region, Ukraine - Vian / Wikimedia Commons
- (2) Fields in Ukraine - State Emergency Service of Ukraine

List of Abbreviations

6NR CBD	Sixth National Report of Ukraine on the Implementation of the Convention on Biological Diversity (2018)
2017 CC NR	National Report of Ukraine on the implementation of the Protocol on the conservation and sustainable use of biological and landscape diversity to the Framework Convention on the protection and sustainable development of the Carpathians (2017)
AEWA	CMS Agreement on the Conservation of African-Eurasian Migratory Waterbirds
ASCI	Area of Special Conservation Interest
BR	biosphere reserve
CBD	Convention on Biological Diversity
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CoE	Council of Europe
COP	(Meeting of) the Conference of the Parties
CR	Critically Endangered (IUCN category of extinction threat for species)
DD	Data Deficient
EC	European Commission
EN	Endangered (IUCN category of extinction threat for species)
EU	European Union
EUROBATS	CMS Agreement on the Conservation of Populations of European Bats
FZS	Frankfurt Zoological Society
GIS	Geographic Information System
HCVF	high conservation value forest (Forest Stewardship Council designation)
IDPs	internally displaced people
IUCN	International Union for Conservation of Nature
MAB	Man and Biosphere Programme
m.a.s.l.	metres above sea level
MEA	multilateral environmental agreement
MEPR	Ministry of Environmental Protection and Natural Resources of Ukraine
MS	Member State
NAS of Ukraine	National Academy of Sciences of Ukraine
NATO	North Atlantic Treaty Organization
NBSAP	National Biodiversity Strategy and Action Plan
NNP	National Nature Park
NR	National Report
NRF	Nature Reserve Fund of Ukraine (protected area network)
NSoER	National State of Environment Report
RLP	Regional Landscape Park
RSIS	Ramsar Sites Information Service
SEI	State Ecological Inspection of Ukraine
TBPA	transboundary protected area
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VFNM	Virgin Forest Nature Monument
VU	Vulnerable (IUCN category of extinction threat for species)
WH	World Heritage
WWF	World Wide Fund for Nature

1. Introduction: purposes of the report, thematic scope, sources of information, timing

Purposes of the report

The work on this report was a part of preparations to the ministerial conference of the Carpathian Convention held on 21-22 November 2022 in Poland, under the Polish Presidency in the Convention. One of the sessions of this conference focused on the situation in Ukraine in terms of direct and indirect impacts of war on the environment and possible measures to address its consequences.

Thematic scope of the report

This report provides a brief overview on the natural environment of Ukraine and progress made in its protection, with particular focus on the Carpathian region of Ukraine. Further, the main part of this report describes damages to the environment of Ukraine and losses of its nature protection services that are direct or indirect result of war. The report presents also the results of a survey conducted in the Carpathian region of Ukraine, indicating the most urgent priorities for supporting protected areas in the Ukrainian part of the Carpathian region.

Sources of information

This report was mostly based on information and data acquired from publicly available sources, including “*Briefings on the environmental damage caused by the Russia’s war of aggression against Ukraine*” regularly published by the Ministry of Environmental Protection and Natural Resources of Ukraine.

In addition, for the purposes of this report, a special survey among protected area administrations in the Carpathian region of Ukraine was carried out in September and October 2022, that allowed to collect, analyse and summarize source information, neither previously gathered nor published.

In fact, the war had also a direct impact on the work on this report, when direct communication with respondents to the survey was impossible or when several internet information sources (including the website of the Ministry of Environmental Protection and Natural Resources of Ukraine) were temporarily unavailable due to breaks in electric power supplies resulting from missile shelling on critical infrastructure in Kyiv and Lviv regions.

Timing of the report

The first part of this report includes a brief summary of the progress in nature conservation made by Ukraine until 24 February 2022, when the unprovoked aggression of the Russian Federation on Ukraine (which began on 26 February 2014 with the occupation of the Autonomous Republic of Crimea, Sevastopol city, later also parts of Donetsk and Luhansk regions) turned into the full-scale war against the Ukrainian nation, its sovereignty, dignity and survival.

The second part of this report briefly summarizes damages to the natural environment of Ukraine until 12 October 2022. The last briefing by the Ministry of Environmental Protection and Natural Resources of Ukraine available prior to closing this report was issued on 15 October 2022. The information cut-off date was 16 October 2022. This report was finalized on 21 October 2022, and translated into the Polish language version.

However, as this report was closed in October 2022, it cannot yet summarize all damages to the environment of Ukraine caused by the war. The Russia’s war against Ukraine continues, hence more casualties of war and damages to the environment can be expected in the coming months.

2. Background information

2.1 General information on the natural environment of Ukraine

Ukraine, with the territory of 603,700 km² is the second-largest country in Europe after the Russian Federation, and the largest country entirely within Europe. Ukraine has only two mountain ranges, Carpathians and Crimean Mountains, with altitudinal zonation of the vegetation. The territory of Ukraine stretches in the river basins of Danube, Dniester, Southern Buh, Dnieper, Don, Vistula, and rivers of the Black and Azov Sea coasts.

According to the Digital Map of European Ecological Regions¹ by the European Topic Centre on Biological Diversity, Ukraine contains six terrestrial ecoregions: Central European mixed forests, Crimean submediterranean forest complex, East European forest steppe, Pannonian mixed forests, Carpathian montane conifer forests, and Pontic steppe. It should be noted that the Carpathian montane conifer forests are part of one of the 238 priority “Global 200 ecoregions”, the European-Mediterranean Montane Mixed Forests (Global 200 ecoregion No 77) which conservation status is already considered critical or endangered².

According to the 2018 Sixth National Report of Ukraine on the Implementation of the Convention on Biological Diversity (further as 6NR CBD) and the 2020 National State of Environment Report (further as NSoER 2020), natural ecosystems of Ukraine include coniferous, mixed and deciduous forests, sub-Mediterranean scrubs, sparsely wooded grasslands, steppes, subalpine and alpine grasslands (polonyna and yayla³), semi-deserts, sandy beaches, spits and dunes, inland cliffs and outcrops, caves, bogs, salt marshes and meadows, freshwater rivers and lakes, brackish lakes and estuaries (liman), saline lakes and gulfs, marine rock cliffs and shores, and the marine ecosystems of the Black and Azov Seas and the Kerch Strait. Natural ecosystems other than forests covered only some 6 to 9 per cent of the country.

According to the 2018 estimates by the Central Intelligence Agency, agricultural land accounted for some 71.2 per cent of the territory of Ukraine, including arable land (56.1 per cent), permanent pasture (13.6 per cent of the country’s territory) and permanent crops (1.5 per cent). Forest area was estimated at 16.8 per cent, and remaining other areas at 12 per cent.

It should be noted here that the majority of some 25 per cent of the country sustaining natural habitats constitute forests (16.8 per cent), including tree stands which cannot be classified as High Nature Value Forests (further as HNVPs) and are in a different condition than e.g. the primeval and old growth forests of the Carpathians (for details please see part 2.6 of this report). According to the State Forest Resources Agency of Ukraine, approximately 16 per cent of forests, covering the area of 1.24 million ha in some 3,300 natural protected areas and objects were included into the Nature Reserve Fund of Ukraine (however, if properly calculated, these 1.24 million ha account for less than 12.92 per cent of 9.6 million ha of forests).

According to the State Forest Resources Agency of Ukraine, the total area of forest land in the country accounted for 10.4 million ha (including 9.6 million ha of actual forests). Despite the relatively small forest area ratio, Ukraine holds the 9th place in Europe in terms of the total size of forest areas, and has the 6th largest growing stock. As visible on map 1, forests are unevenly distributed throughout the country, the highest forest cover occurs in the Carpathian and Polesie regions (the highest forest cover is in Zakarpattia region, 51.6 per cent).

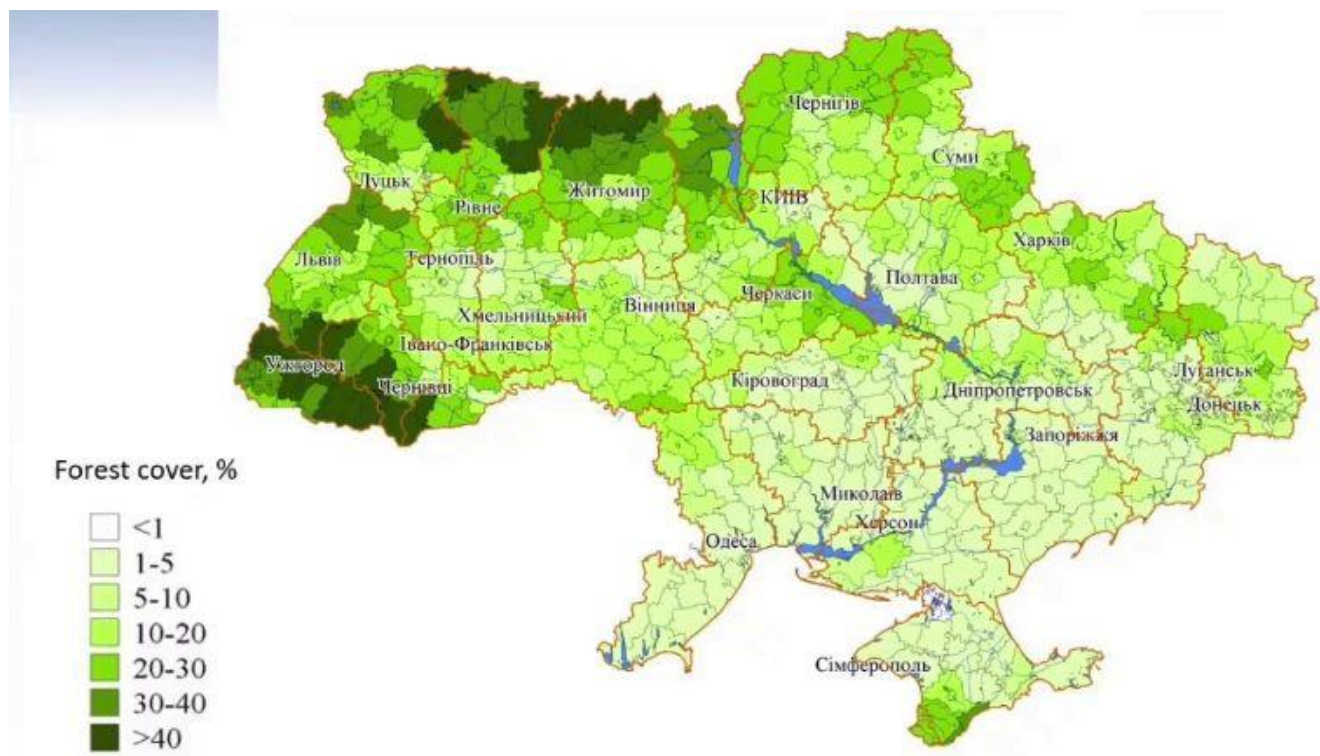
The State Forest Resources Agency of Ukraine manages 73.0 per cent of all forests in the country, while 7.5 per cent of forest area constitute the “reserve land” managed by the entities of the Nature Reserve Fund of Ukraine, further 7.0 per cent is managed by other Ministries and state agencies, and the remaining 12.5 per cent of forests is in communal ownership, managed by the local authorities.

¹ <https://www.eea.europa.eu/data-and-maps/figures/dmeer-digital-map-of-european-ecological-regions>

² Olson, D., Dinerstein, E. (2009). The Global 200: Priority ecoregions for global conservation. *Annals of the Missouri Botanical Garden* 89. 125-126.

³ Yayla is the Crimean Tatar word for “alpine meadow”, also used for naming particular subranges and plateaus of the Crimean Mountains.

Map 1. Forest cover of administrative-territorial units in Ukraine



Source: State Forest Resources Agency of Ukraine.

Species diversity, threatened species

According to 6NR CBD and NSoER 2020, biodiversity of the country includes at least 12,000 fungi, 27,000 plant, and 35,000 animal species, many of them rare and threatened by extinction. The global IUCN Red List (version 2022-1) informs on 528 plant, 42 fungi, and 1,191 animal species occurring in Ukraine. According to the IUCN summary statistics in Table 5 “Number of threatened species in each major taxonomic group by country in North Asia”, 147 species occurring in Ukraine are globally threatened by extinction: 29 plant, 14 fungi, and 104 animal species (13 mammal, 18 bird, 1 reptile, 25 fish, 9 mollusc, and 38 other invertebrate species). Among plant species, 3 were categorized as Critically Endangered (CR), 14 as Endangered (EN), 12 as Vulnerable (VU), 8 as Near Threatened (NT), 439 as Least Concern (LC), and 51 as Data Deficient (DD). As for fungi, 3 species were considered EN, 11 VU, 5 NT, 22 LC, and 1 DD.

As for animals, Table 6a “Number of animal species (kingdom: Animalia) listed in each IUCN Red List Category by country in North Asia” informed on a slightly different number of threatened animal species, 110 (versus only 104 indicated in Table 5), including 16 animal species categorized as CR (additionally, 1 other CR animal species was categorized as Possibly Extinct, PE), 34 as EN and 60 as VU. Other 71 animal species were categorized as NT, 933 as LC, and 75 as DD.

IUCN Red List (version 2022-1) informs also on 2 endemic vascular plant (birches) species (one of them threatened), 1 endemic reptile species, and 2 threatened endemic mammal species occurring in Ukraine.

However, it should be noted that not all plant, fish, mollusc and other invertebrate species have so far been assessed for the IUCN Red List (in particular not the regional and local endemics). Therefore, the flora, fungi and fauna of Ukraine can include more species globally threatened by extinction, not yet assigned relevant IUCN Red List extinction threat categories. Similarly, due to missing or incomplete data from recent field research and inventory works, numerous species were temporarily categorized as DD, despite their confirmed rarity status.

According to 6NR CBD, *”threats for biodiversity of Ukraine are mainly due to habitat degradation. Natural habitats are preserved at the best only at 25% of the Ukrainian land, and their transformation is still in progress. Imbalanced land use structure, excessive cultivation and low forest coverage are also factors of vulnerability of Ukraine to climate change. Steppes, which have historically been located on 40% of Ukrainian territory, now are remaining only on 3% of their original distribution, and they are fragmented into 10,000 pieces. They are also susceptible to climate change: meadow transformation at the north and desertification at the south”*.

2.2 Legal, policy and institutional framework for environment protection in Ukraine

Legal and policy framework

Ukraine is Party to several relevant multilateral environmental agreements (further as MEAs), including the 1971 Convention on Wetlands of International Importance, especially as Waterfowl Habitat⁴ (Ramsar Convention), the 1972 UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage⁵, the 1979 UN Convention on the Conservation of Migratory Species of Wild Animals (CMS)⁶, the 1979 Council of Europe’s Convention on the Conservation of European Wildlife and Natural Habitats⁷ (Bern Convention) and the 1992 UN Convention on Biological Diversity (CBD)⁸. Most species listed in Appendices to CMS or the Bern Convention are included into the National Red Data Book that enhanced their protection in Ukraine.

Further, Ukraine initiated, and is a Party to and the Depository of the Framework Convention on the Protection and Sustainable Development of the Carpathians⁹ (further as the Carpathian Convention) signed on 22 May 2003 in Kyiv by seven states sharing the Carpathian region. The Carpathian Convention is the only multi-level governance mechanism covering the whole of the Carpathian area and, besides the Alpine Convention, the second sub-regional treaty-based regime for the protection and sustainable development of a mountain region worldwide.

Since the entry into force of the Ukraine – European Union Association Agreement on 1 September 2017 Ukraine is in the process of 'transposing' (or integrating) EU environmental acquis into its national legislation, including the Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds¹⁰ (commonly abbreviated as the “Birds Directive”), the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora¹¹ (commonly abbreviated as the “Habitats Directive”), and the Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species¹².

It should also be noted that the EU candidate status granted to Ukraine on 23 June 2022 shall further accelerate the harmonization of biodiversity conservation-related Ukrainian national legislation with the above Directives.

The main legal acts defining the main tasks in the field of environmental protection, conservation of biological and landscape diversity and their integration into other sectoral policies at the national level are the laws “On environmental protection”, “On the Nature Reserve Fund of Ukraine”, “On ecological network of Ukraine”, “On animal world”, “On plant world”, and “On the Red Data Book of Ukraine”.

⁴ https://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf

⁵ <https://whc.unesco.org/en/conventiontext/>

⁶ <https://www.cms.int/en/legalinstrument/cms>

⁷ <https://www.coe.int/en/web/conventions/full-list/-/conventions/rms/0900001680078aff>

⁸ <https://www.cbd.int/>

⁹ <http://www.carpathianconvention.org/>

¹⁰ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ L 20, 26.1.2010, pp. 7-25) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0147>

¹¹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ L 206 of 22.7.1992, p. 7) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31992L0043>

¹² Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (OJ L 317, 4.11.2014, pp. 35-55) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2014:317:TOC>

Other most relevant laws, defining strategic directions of the biodiversity conservation-related state policy include the 2000 Law "On the nationwide program for the formation of the national ecological network of Ukraine for 2000-2015" and the 2019 Law "On the Basic principles (strategy) of the state environmental policy of Ukraine for the period until 2030".

In the "Carpathian-focused context" of this report, particularly important is the 2017 Law "On amendments to some legislative acts of Ukraine regarding the protection of primeval forests in accordance with the Framework Convention on the Protection and Sustainable Development of the Carpathians" (commonly called "the Law on virgin forests"), in response to the adoption of the "Criteria and Indicators for identification of virgin forests in the Carpathians" by the Parties to the Carpathian Convention in 2014 (Decision COP4/4.3). This law defined the natural, primeval (virgin) and semi-primeval (quasi-primeval) forests, included such into the category of forests of nature protection, scientific, historical and cultural importance.

Further, this law provided the legal basis for assigning such forests the legal protective status of "virgin forest natural monuments" (hence, a new national protected area category was added to the Law "On the Nature Reserve Fund of Ukraine"), surrounded by external protective buffer zones with a width of at least twice the height of the concerned forest stand, where continuous and gradual felling is prohibited. In 2018 MEPR adopted the "Methodology for determining whether forest areas belong to primeval, quasi-primal, and natural forests", which further enhanced the identification of old-growth and primeval forests of the Carpathians.

At the regional level, numerous relevant legal acts, strategies and programs (some of them used for the purposes of this report, listed under "Sources of information") are developed, adopted and implemented, concerning e.g. environmental protection, the formation of ecological networks and the development of the nature reserve fund (Ukrainian term meaning protected area network).

Institutional framework

An important central executive body is the State Ecological Inspection of Ukraine, entrusted the tasks including e.g. the implementation of state policy on state supervision (control) in the field of environmental protection, rational use, reproduction and protection of natural resources; and implementation of state supervision (control) of compliance with the requirements of the law, in particular, in relation to land protection, subsoil; environmental and radiation safety; protection and use of territories and objects of the nature reserve fund; conservation, protection, use and reproduction of forests; preservation, reproduction and sustainable use of biological and landscape diversity; rational use, reproduction and protection of objects of the animal and plant world; management of hunting economy and carrying out hunting; protection, rational use and reproduction of waters and reproduction of water resources; atmospheric air protection; formation, preservation and use of an ecological network; state of the natural environment; management of waste, hazardous chemicals, pesticides and agrochemicals; and the implementation of biological and genetic safety measures in relation to biological objects of the natural environment during the creation, research and practical use of genetically modified organisms.

In the context of this report, most relevant law enforcement control function of the State Ecological Inspection include those related to the conservation of wetlands, and to the observance of the regime of use of the Nature Reserve Fund areas, other lands of nature protective importance, as well as territories subject to special protection.

The State Ecological Inspection of Ukraine (SEI) has its subordinate regional branches in all four administrative regions harbouring the Carpathian region of Ukraine.

At the regional level, departments of ecology and natural resources subordinate to the head of the regional state administration (but accountable to, and under the control of MEPR) ensure the implementation of the state environmental policy and law enforcement. Last, but not least, at the local level, administrations of protected areas directly implement the state nature conservation policy and apply protective measures on the ground.

2.3 Nature protection in Ukraine

Species conservation

The legal basis for species conservation and protection provide the 1999 Law "On the plant world" and 2001 Law "On the animal world", in correspondence with the 2002 Law "On the Red Book of Ukraine", and the 2002 Resolution of the Cabinet of Ministers of Ukraine "On approval of the Regulation on the Green Book of Ukraine".

In accordance with the 1999 Law "On the plant world", rare and endangered species of plants (and fungi) that grow in natural conditions are subject to special protection and are listed in the Red Book of Ukraine. Other plants and fungi species, not listed in the Red Book but are rare or endangered in the territory of the Autonomous Republic of Crimea, regions (oblasts), cities of Kyiv and Sevastopol, may be included in the List of plant species subject to special protection in these territories.

Further, rare, endangered and typical natural plant communities, are subject to protection throughout the territory of Ukraine and are entered into the Green Book of Ukraine, that summarizes information on their protective status, and provides the basis for the development of protective measures for the preservation, reproduction and use of those natural plant communities.

In accordance with the 2001 Law "On the animal world", one of the measures for the protection of animal species is the establishment of a special regime for the protection of animal species listed in the Red Book of Ukraine and in the lists of animal species subject to special protection in the territory of the Autonomous Republic of Crimea, regions (oblasts), cities of Kyiv and Sevastopol. The above law constitutes also the legal basis for the development and implementation of programs (action plans) for the preservation and reproduction of wild animal species that are under threat of extinction.

According to 6NR CBD, "*biodiversity of Ukraine is generally data deficient*", but the 2009 National Red Data Book (third edition) listed 826 species of flora (611 vascular plants, 46 bryophytes, 60 algae, 52 lichens and 57 fungi) and 542 species of animals (2 hydroid polyps, 2 round and 9 ringworms, 31 crustaceans, 2 arachnids, 3 millipedes, 2 copepods, 226 insects, 20 molluscs, 2 Cyclostomata, 69 fish, 8 amphibians, 11 reptiles, 87 birds, and 68 mammals). As many as 45 invertebrate and 61 vertebrate species were considered critically endangered and 6 animal species were considered already extinct in Ukraine.

Protected species included 24 species of invertebrates and 17 species of vertebrates that are endemics of Ukraine or such regions as the Carpathians. Several widespread European species have decreasing population trends and require special conservation measures in Ukraine, e.g. sturgeons, turbot, harbour porpoise, European bison, and elk. 179 species of plants and fungi were critically endangered and 10 species were extinct in the wild in Ukraine.

In 2021 the 2009 National Red Data Book has considerably been revised and updated. On 19 January 2021 the Ministry of Environmental Protection and Natural Resources of Ukraine (further as MEPR) approved the "List of animal species entered into the Red Book of Ukraine (animal world) and species of animals excluded from the Red Book of Ukraine (animal world)", according to which the fourth edition of the National Red Data Book currently includes 687 animal species. On 15 February 2021 MEPR approved the "Lists of plant and mushroom species included in the Red Book of Ukraine (plant world) and plant and mushroom species excluded from the Red Book of Ukraine (plant world)", according to which the fourth edition of the National Red Data Book currently includes 858 plant and fungi species.

Protected areas

One of the most efficient solutions for the preservation of biological and landscape diversity is the designation of protected areas, regulated in Ukraine by the 1992 Law "On the Nature Reserve Fund of Ukraine".

This law defines the following national “natural” protected area categories: *природні заповідники* (“nature zapovedniks”, following the former USSR protected area categorization system) analogue of strict nature reserves (IUCN protected area management category Ia), thus further in the text named “nature reserves”), *біосферні заповідники* biosphere reserves (IUCN cat. II), *національні природні парки* national nature parks (IUCN cat. II), *регіональні ландшафтні парки* regional landscape parks (IUCN cat. V), *заказники* (“zakazniks”, another term of the former USSR categorization system, implying active management) further named “reservations” (IUCN cat. IV), *пам’ятки природи* natural monuments (IUCN cat. III) and *заповідні урочища* protected sites (IUCN cat. Ia).

In addition to “natural” protected area categories the above 1992 Law defines also five categories of “artificially created” protected objects: botanical gardens, dendrological parks, zoological parks, natural monuments, and parks that are monuments of horticultural art.

Accordingly to the above 1992 Law, reservations can be classified as landscape, forest, botanical, general zoological, ornithological, entomological, ichthyological, hydrological, general geological, paleontological and karst-speleological reservations. Natural monuments can be classified as complex, primeval forest, botanical, zoological, hydrological and geological natural monuments. Natural monuments can be located on the territory of other objects of the nature reserve fund. Reservations, natural monuments, botanical gardens, dendrological parks, zoological parks, and parks-monuments of horticultural art may be either of national or local importance.

According to the State Forest Resources Agency of Ukraine, as at 1 January 2022, the Nature Reserve Fund of Ukraine (further as NRF) consisted of 8,796 protected natural areas and objects, that jointly encompassed the total area of 4.501 million ha (6.28 per cent of the country’s territory). NRF included 19 nature reserves, 5 biosphere reserves and 53 national nature parks (further as NNPs). 6NR CB mentioned also a marine protected area “Zernov Phyllophora Field” (4,025 km²) in the Ukrainian exclusive economic zone in the Black Sea.

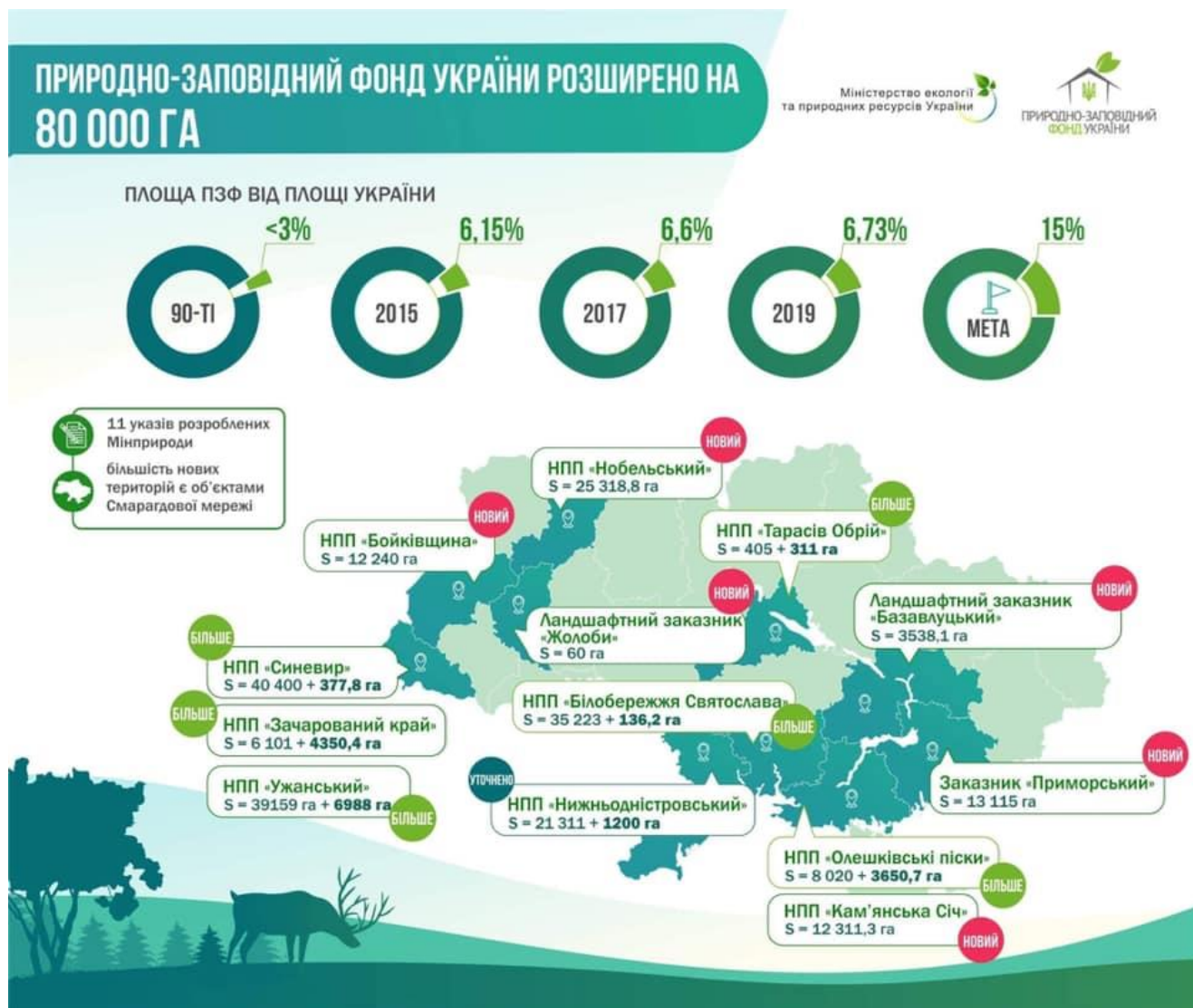
According to 6NR CBD, Ukraine considerably extended the NRF area in 2013–2017, when as many as 268 protected areas were designated, with a total area of 3,342 km² (which accounted for 8.4 per cent of the NRF area as at 1 January 2018).

However, the main achievement in this respect in 2016 was the designation of the Chernobyl Radiation and Ecological Biosphere Reserve. Further, the geographical distribution of protected areas is uneven, in result some main ecosystems representative of Ukraine are underrepresented in NRF.

For example, the steppe zone covers some 40 per cent of the country, but only 3 per cent of steppes are preserved in natural (or close to natural) conditions, while NRF includes only 10 per cent of these “virgin steppes” (thus 0.3 per cent of the steppe zone in Ukraine). 6NR CBD informed that some 900 sites were considered for the further extension of NRF, which, accordingly to the 2014 State Strategy for Regional Development for the period until 2020, was expected to reach 15 per cent of the country’s territory by early 2021 (which target value has not yet been achieved).

The recent extension of NRF included the designation of new NNPs and reservations, as well as the extension of the existing ones, in several regions of the country. As for the Carpathians, in 2019 the areas of three NNPs (Synevyr, Uzhanskyi, and Zacharovanyi kray) in Zakarpattia region were considerably extended, while a new NNP (Boykivshchyna) was designated in Lviv region (see Fig. 1).

Fig. 1. Extensions of the Nature Reserve Fund of Ukraine



Source: Ministry of Environmental Protection and Natural Resources of Ukraine

Emerald Network

Ukraine considerably progressed in the designation of Areas of Special Conservation Interest (further as ASCIs) constituting the Emerald Network¹³, fully compatible with the EU Natura 2000 network, meaning that ASCIs of the Emerald network can, upon the country's accession to the EU, become sites of the Natura 2000 network.

Setting up of the Emerald network includes three phases. In the first phase countries assess their natural resources, identify relevant species and habitats of the European interest, and subsequently select potential sites suitable for ensuring their long-term survival. During the second phase, all proposed sites are thoroughly assessed at biogeographical level for their sufficiency to achieve the ultimate objective of the Network, for the eventual approval and endorsement by the Standing Committee of the Bern Convention. Sites proposed as Emerald sites can be approved as ASCIs only if they contribute to the conservation of habitat types listed in Resolution No. 4 (1996) and species listed in Resolution No. 6 (1998) of the Bern Convention.

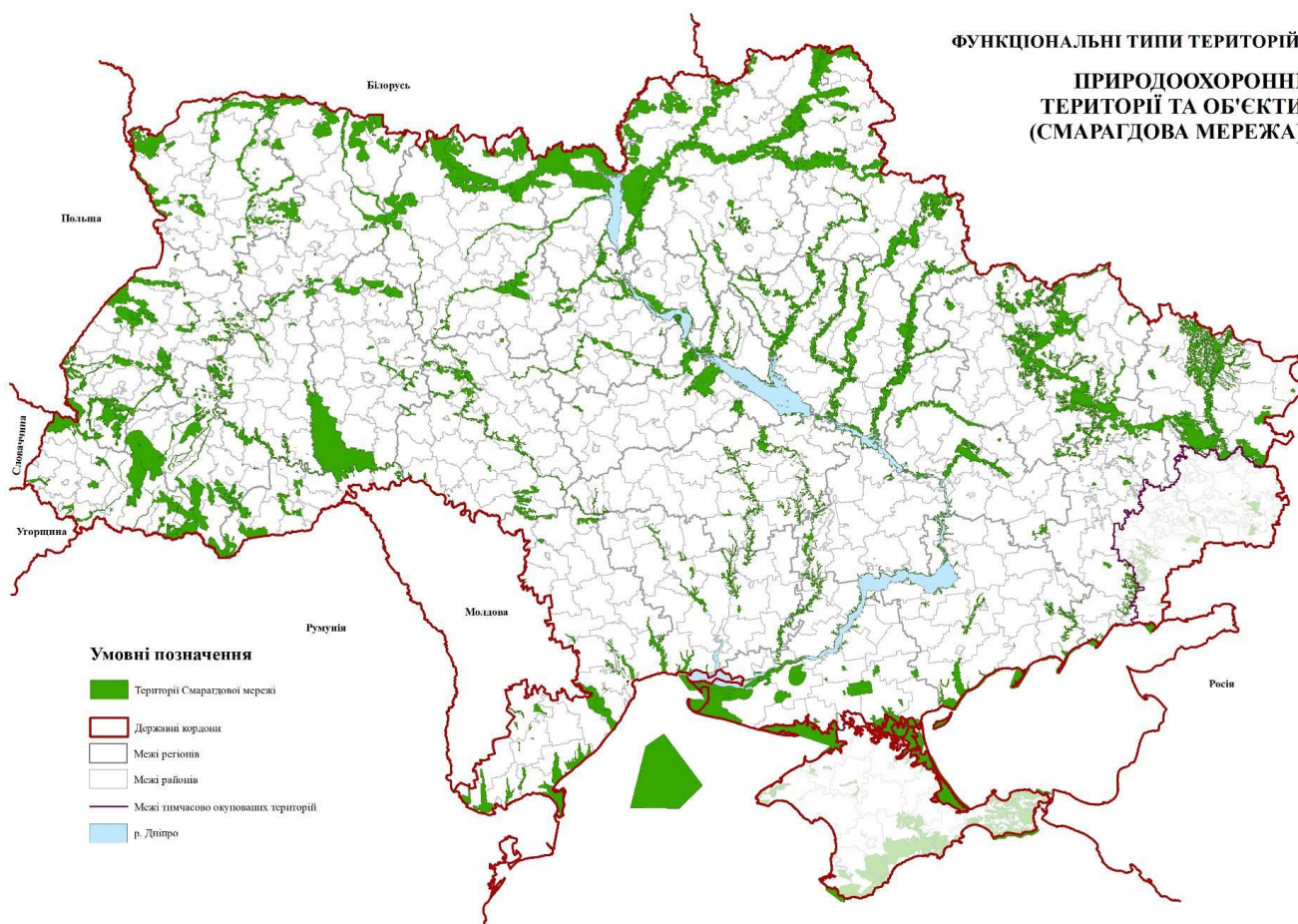
¹³ <https://www.coe.int/en/web/bern-convention/emerald-network>

In the last third phase, ASCIs should be designated at the national level, which implies that the implementation of management, reporting and monitoring measures becomes the responsibility of national authorities. The official lists of candidate Emerald sites and adopted Emerald sites are updated after each annual meeting of the Standing Committee to the Bern Convention (last in December 2021).

However, it should be emphasized, that the designation of any area or site as an ASCI of the Emerald Network does not provide any additional legal protection other than provided by the national legislation of the respective country. ASCIs of the Emerald Network are designated on the basis of a non-binding Recommendation No. 16 (1989)¹⁴ of the Standing Committee of the Convention addressed to its Contracting Parties, hence its effects for the protection of the sites concerned depend on whether the Contracting Parties ensure their legal protection by designating a PA of a respective national category, pursuant to its legislation in force.

According to the updated list of officially adopted Emerald Network sites (December 2021), the Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats adopted 377 ASCIs in Ukraine (see map 2 below), including 30 ASCIs in the Carpathian region (for details please see part 2.6 of this report). Other 162 proposed potential ASCIs are currently being verified.

Map 2. ASCIs of the Emerald Network in Ukraine



Source: Resolution of the Cabinet of Ministers of Ukraine dated 5 August 2020 No. 695 "On approval of the State Strategy for Regional Development for 2021-2027".

¹⁴ https://search.coe.int/bern-convention/Pages/result_details.aspx?ObjectId=0900001680746c25

UNESCO World Heritage Sites

Among seven World Heritage (further as WH) sites in Ukraine, only one has been inscribed on the WH List under the “natural” criteria, the transnational WH property “Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe” (for details please see part 2.6 of this report).

As for potential new nominations, as at October 2022 the Tentative List by Ukraine contained 17 sites considered for potential inscription onto the WH List, including one site selected under “natural” criteria (National Steppe Biosphere Reserve "Askaniya Nowa" submitted in 1989) and two sites selected under “mixed” cultural and natural criteria (Dendrological Park "Sofijivka", submitted in 2000, and Cultural Landscape of “Cave Towns” of the Crimean Gothia, submitted in 2012).

UNESCO MAB Biosphere Reserves

As of October 2022, Ukraine harboured eight biosphere reserves (including two in the Carpathian region) designated by UNESCO under the Man and Biosphere (MAB) Programme:

- Chernomorskiy Biosphere Reserve¹⁵ (1984);
- Askaniya-Nova Biosphere Reserve¹⁶ (1985);
- Carpathian Biosphere Reserve¹⁷ (1992);
- Danube Delta Transboundary Biosphere Reserve¹⁸ (Romania/Ukraine, 1998, former Dunaisky);
- East Carpathians Transboundary Biosphere Reserve¹⁹ (Poland/Slovakia/Ukraine, 1998);
- West Polesie Transboundary Biosphere Reserve²⁰ (Belarus/Poland/Ukraine, 2002, former Shatskiy, extended and renamed in 2012);
- Desnianskyi Biosphere Reserve²¹ (2009);
- Roztochya Biosphere Reserve²² (2011, since 2019 transboundary with Roztocze - Poland).

It should be noted that a “biosphere reserve” is simultaneously a national protected area category under the Ukrainian legislation (1992 Law No. 2457-XII "On the Nature Reserve Fund of Ukraine"). Thus, Carpathian BR is simultaneously bearing both designations, having the legal status of a biosphere reserve in accordance with the above Law, also designated as a BR under the UNESCO MAB Programme.

Ramsar sites

According to the Ramsar Sites Information Service (RSIS), as at October 2022, Ukraine harboured 50 wetlands of international importance (Ramsar Sites) jointly covering the total area of 930,559 ha. As visible on map 2 below, the vast majority of Ramsar Sites designated in concentrates in three regions of the country: in its south-eastern part along the coast of the Black and Azov Seas (most affected by hostilities), in the Polesie region, and in the Carpathians.

The Carpathian region of Ukraine harbours eight Ramsar sites, seven of which were designated recently, in 2019 (for details please see part 2.6 of this report).

¹⁵ <https://en.unesco.org/biosphere/eu-na/chernomorskiy>

¹⁶ <https://en.unesco.org/biosphere/eu-na/askaniya-nova>

¹⁷ <https://en.unesco.org/biosphere/eu-na/carpathian>

¹⁸ <https://en.unesco.org/biosphere/eu-na/danube-delta>

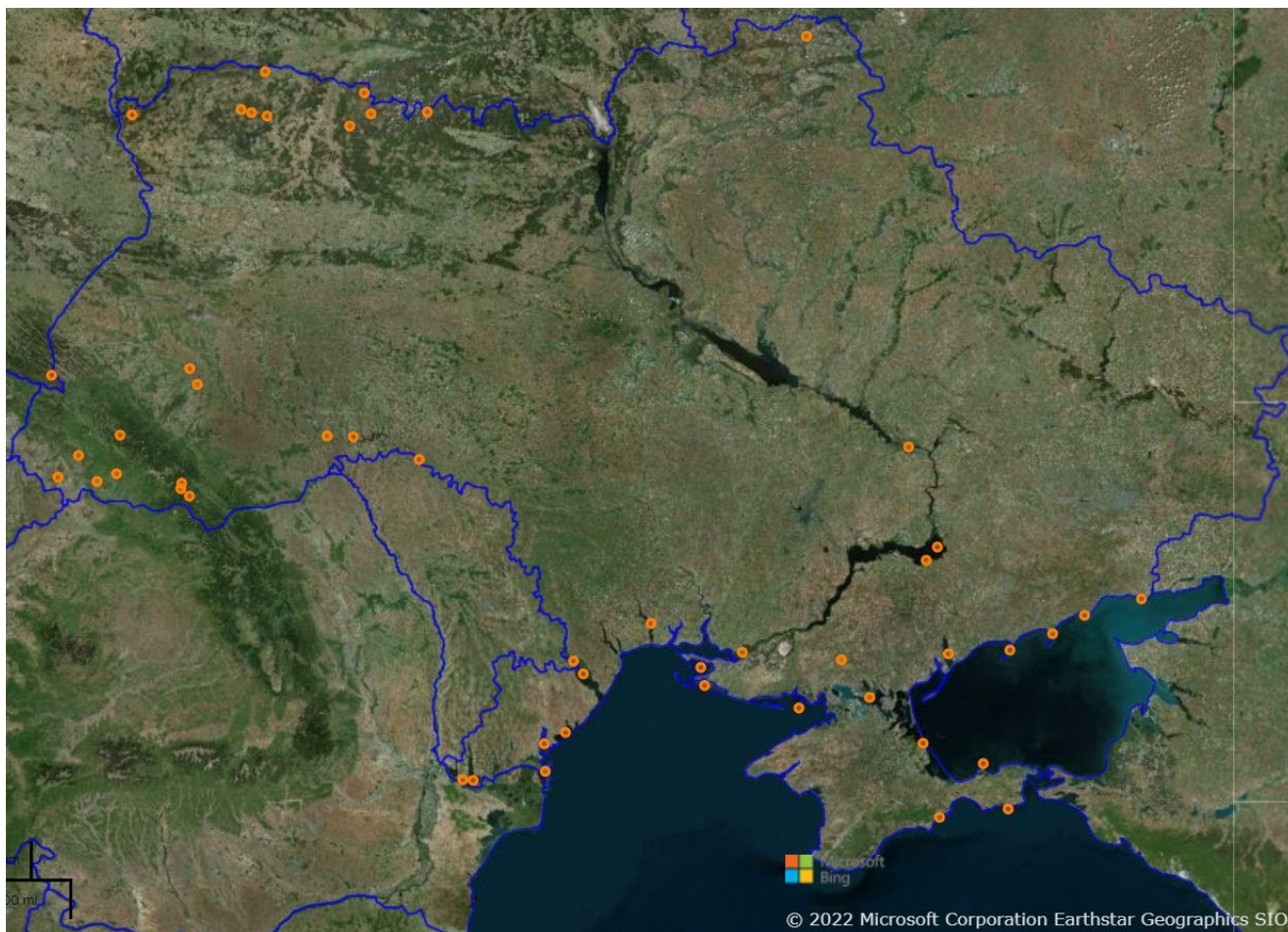
¹⁹ <https://en.unesco.org/biosphere/eu-na/east-carpathians>

²⁰ <https://en.unesco.org/biosphere/eu-na/west-polesie>

²¹ <https://en.unesco.org/biosphere/eu-na/desnianskyi>

²² <https://en.unesco.org/biosphere/eu-na/roztocze>

Map 3. Wetlands of international importance (Ramsar Sites) in Ukraine, 2022.



Source: Ramsar Sites Information Service

2.4 Basic information on the Carpathian region of Ukraine

Geographical location and administrative division of the Carpathian region of Ukraine

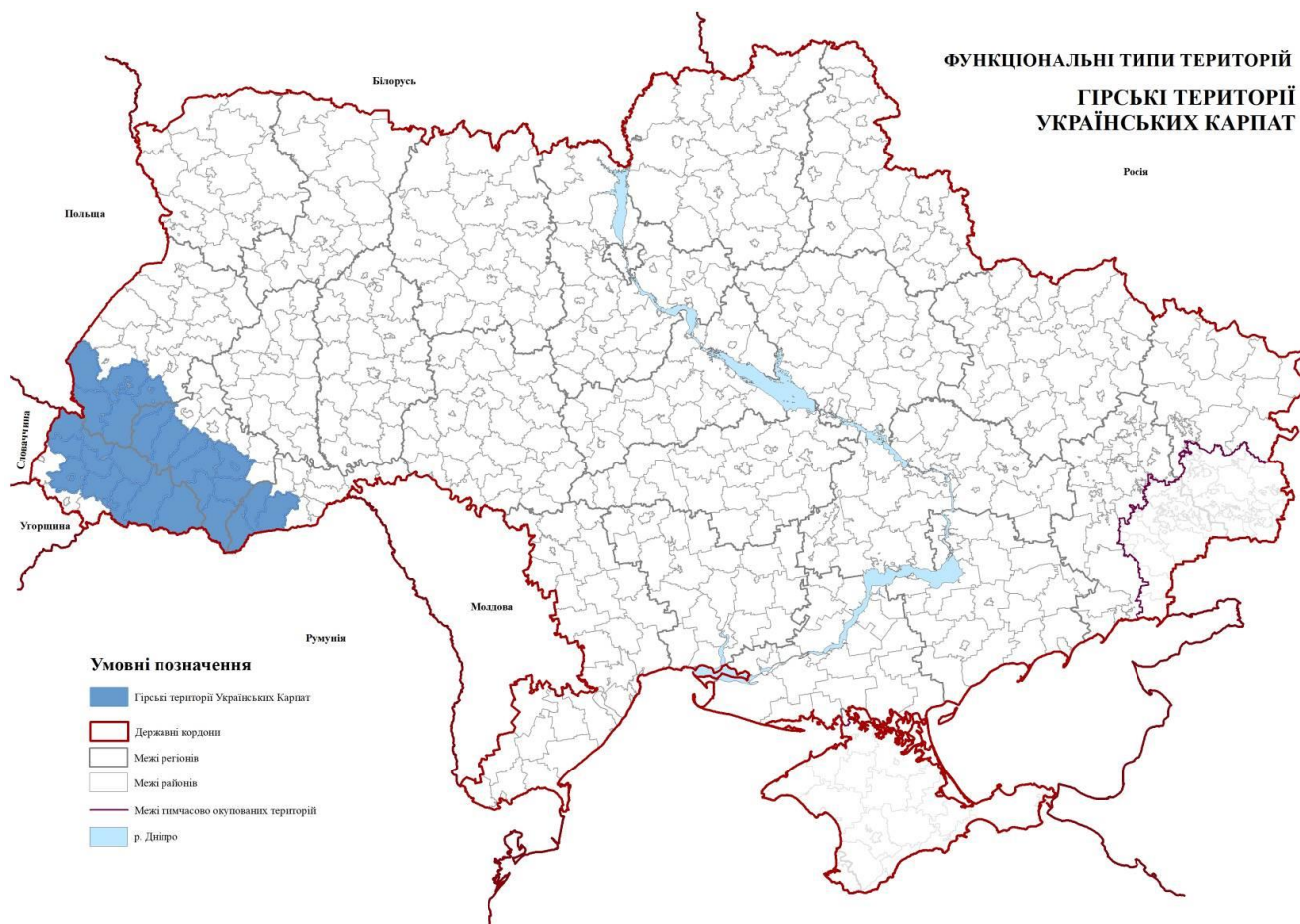
The Carpathian region of Ukraine constitutes the westernmost part of the country, located at the state borders with several neighbouring countries: Poland, Slovakia, Hungary and Romania, which provides an excellent opportunity for the further development of transboundary cooperation on biological and landscape diversity conservation, as well as for cooperation and sustainable development of neighbouring local communities in the above countries.

In the context of this report, it should be mentioned that the Carpathian region of Ukraine has been (at least so far, until late October 2022) the region least affected by direct impacts of hostilities of the current Russian aggression against Ukraine, as the air raid alerts, missile shelling and resulting damages to critical infrastructure and power supply breaks were much less frequent here than in the other parts of Ukraine. In particular the Zakarpattia region was comparatively safe, which can partly be explained by its geographical location (separated by the Carpathian Mountains from all other regions of Ukraine and located at the state borders with four NATO countries), and partly also by the fact that the population of Zakarpattia includes Hungarian ethnic minority group.

However, resulting from the above, the Carpathian region of Ukraine, commonly perceived as “safe”, currently hosts a significant number of internally displaced people (further as IDPs), often accommodated in facilities provided “ad hoc” by protected area administrations, temporarily adopted for the above purpose.

The Ukrainian part of the Carpathians stretches in four administrative regions (oblasts) of the country, totalling for 56.6 thousand km² (5,660.7 thousand ha): Lviv (2,183.1 thousand ha), Ivano-Frankivsk (1,392.7), Chernivtsi (809.6), and Zakarpattia (1,275.3 thousand ha).

Map 4. Location of the Carpathian region of Ukraine



Source: Resolution of the Cabinet of Ministers of Ukraine dated 5 August 2020 No. 695 "On approval of the State Strategy for Regional Development for 2021-2027".

According to the 2017 National Report of Ukraine on the implementation of the Protocol on the conservation and sustainable use of biological and landscape diversity to the Framework Convention on the protection and sustainable development of the Carpathians (further as 2017 CC NR), the Ukrainian part of the Carpathians, stretching from northwest to southeast along some 280 km, with an average width of 100 km, accounts for 10.3 per cent of the total area encompassed by the Carpathian Mountains range. According to 2017 CC NR, the Ukrainian Carpathians occupy an area of 37 thousand km² (or 3.5% of the territory of Ukraine), where mountain areas encompass some 19.5 thousand km² and cover as much as 69.5 per cent of the territory of Zakarpattia region (its north-eastern part), 37.5 per cent of Ivano-Frankivsk region (southern part), 18.6 per cent of Lviv region (southwestern part) and 15.8 per cent of Chernivtsi region (western part). Some other sources estimate the size of mountain areas of the Ukrainian part of the Carpathians differently, between 22 and 24 thousand km².

For the purposes of this report, based on the statistical data on four administrative units (oblasts), which borders include the Carpathian region of Ukraine, it was assumed that the mountain areas of the Ukrainian part of the Carpathians cover a total of 2,175,270 ha (i.e. 21.75 thousand km²), of which 817,300 ha are located in Zakarpattia region, 672,370 ha in Ivano-Frankivsk region, 390,900 ha in Lviv region, and 294,700 ha in Chernivtsi region.

Population

According to 2022 “Ecological passports” of the four administrative regions harbouring the Carpathian region of Ukraine, as at 2021 the population of these administrative units totalled for over 5,973.6 thousand people. However, almost half of the above inhabited cities and towns (located mostly in lowlands and foothills, scarce in the mountain areas of the Carpathian region) while 3,003.4 thousand (approx. 50.28 per cent) inhabited either larger villages (indicated separately in Ukrainian statistics) or small rural settlements.

The population numbers reflect the size of regions, the largest of the four regions concerned, Lviv region (2,183.1 thousand ha) was inhabited by 2,478.1 thousand people, including 1,516.3 thousand in 44 cities and towns, and 961.8 thousand inhabiting 34 villages and 1,850 rural settlements. Consequently, the second largest Ivano-Frankivsk region (1,392.7 thousand ha) had the total population of 1.351.8 thousand, including 602.6 thousand in 15 cities and towns, and 749.2 thousand inhabiting 24 villages and 765 rural settlements. Slightly smaller Zakarpattia region (1,275.3 thousand ha) had the population of 1253.8 thousand people, of which 465.9 thousand inhabited 11 cities and towns, the remaining 787.9 thousand lived in 19 villages and 579 rural settlements. The smallest of the four, Chernivtsi region (809.6 thousand ha) was inhabited by 890,457 thousand people, including 386 thousand in 11 cities and towns, and 504.5 thousand inhabitants of 8 villages and 398 rural settlements.

However, it should be noted that the above numbers relate to the whole administrative regions, not necessarily their “Carpathian parts”. In result of the Territorial and Decentralization Reform in Ukraine, around the break of 2020 and 2021 the number of districts (rayony) in each administrative region considerably decreased, which is not yet always well accommodated by regional statistics. Due to the above, the extraction and analysis of data relevant solely for the Carpathian parts of the region became even more complicated than before or simply impossible.

Further, it should be reminded, that the above numbers reflect the situation as at the end of 2021, while less than two months later the Russian full-scale war against Ukraine began. In result, the four administrative regions of the “comparatively safe” Carpathian region of Ukraine were flooded by the wave of IDPs coming from other regions, more affected by hostilities. For example, solely the number of officially registered IDPs (which, for obvious reasons, is well below their actual number) in Chernivtsi region accounted (as at 16 September) for 106 thousand IDPs (including 37 thousand children), in Ivano-Frankivsk region (as at 29 September) 147,172 IDPs (including 45,784 below the age of 16), in Lviv region (as at 3 October) 151 thousand IDPs (including 75 thousand children), while Zakarpattia region, considered the safest part of Ukraine due to its geographical location and the proximity of border crossings with three out of four (except for Poland) neighbouring EU MSs accommodated (as at 16 October) as many as 390 thousand IDPs.

According to the 2019 State Program for the Development of the Ukrainian Carpathian Region for 2020-2022, 715 settlements in the Carpathian region of Ukraine have the officially recognized status of mountain settlements (in accordance with the 1995 Law "On the status of mountain settlements in Ukraine", that set the number of criteria, including the location at an altitude exceeding 400 m.a.s.l., slope steepness, size of arable land per inhabitant, and several indicators of the severe climatic conditions). Out of these 715 mountain settlements as many as 279 (39 per cent) are located at an altitude exceeding 600 m.a.s.l., and therefore difficult to reach.

Land use

Due to natural conditions (e.g. soils, altitude, climate) and forest cover more than twice higher than the country average (37.08 versus 16.8 per cent respectively), the Carpathian region of Ukraine has a much lower share of agricultural areas in the total area than the country average (71.2 per cent). According to 2022 “Ecological passports” of the four administrative regions harbouring the Carpathian region of Ukraine, the land use pattern significantly varied among regions and was as follows:

- Lviv region (2,183.1 thousand ha): agricultural land 1,261.5 thousand ha (57.8%) including arable land 794.1 thousand ha (36.4%), meadows and pastures 443.5 thousand ha (20.3%), permanent crops 23.2 thousand ha (1.1%), while forest vegetation covered 629.1 thousand ha (28.0%);
- Ivano-Frankivsk region (1,392.7 thousand ha): agricultural land 621.2 thousand ha (44.6%) including arable land 400.6 thousand ha (28.8%), meadows and pastures 202.9 thousand ha (14.6%), permanent crops 15.4 thousand ha (2.5%), while forest vegetation covered 558.9 thousand ha (40.1%);
- Zakarpattia region (1,275.3 thousand ha): agricultural land 451.0 thousand ha (35.4%) including arable land 200.2 thousand ha (15.7%), meadows and pastures 223.5 thousand ha (17.6%), permanent crops 27.3 thousand ha (2.1%), while forest vegetation covered 657.8 thousand ha (51.6%);
- Chernivtsi region (809.6 thousand ha): agricultural land 469.7 thousand ha (58.0%) including arable land 330.7 thousand ha (40.8%), meadows and pastures 108.7 thousand ha (13.5%), permanent crops 30.3 thousand ha (3.8%), while forest vegetation covered 253.0 thousand ha (31.2%).

Hence, the land in Lviv and Chernivtsi regions was predominantly used for agricultural purposes (although the forest cover in these two regions was still well over the country average), while Ivano-Frankivsk region and in particular Zakarpattia region had much higher forest cover (the majority of which in the Carpathian mountains) than any other administrative regions of Ukraine.

2.5 Characteristics of the natural environment of the Carpathian region of Ukraine

The Ukrainian Carpathians are part of the Eastern Carpathian mountain system, divided into the Outer Eastern Carpathians and the Inner Eastern Carpathians. Mountain ridges stretch from the northwest to the southeast, at the distance of 280 km, between the sources of San and Dniester (both close to the state border with Poland) and the sources of Suceava river (at the state border with Romania), separated by longitudinal depressions and deep transverse valleys. Outer Eastern Carpathians in Ukraine are divided into mid-altitude Eastern Beskydy Mts., then Vododilno-Verkhovynske Carpathians and Polonynsko-Chornogirsky Carpathians. The last unit includes the mid-altitude flysch mountain ridges of Polonyna Rivna, Polonyna Borzhava, Polonyna Krasna, and high-altitude Svydovets and Chornohora massifs. All six peaks of the Ukrainian Carpathians exceeding 2,000 m.a.s.l., including Mt. Hoverla (2,061, the highest point of Ukraine), Brebeneskul (2,032), Pip Ivan Chornohorskyi (2,028), Petros (2,020), Gutyn Tomnatyk (2,017) and Rebra (2,001 m.a.s.l.) occur in Chornohora massif. The Inner Eastern Carpathians include ancient volcanic Vihorlat-Hutinsky ridge and crystalline Marmarosh massif. The north-eastern edge of the Carpathian region of Ukraine harbours low-mountainous landscapes (up to 400 m.a.s.l.) in the interfluves of the Dniester, Stryi, Svich, Limnitsa, Bystrytsa, Prut, Cheremosh, and Siret rivers. Hilly-valley landscapes (exceeding 300 m.a.s.l.) are characteristic of the interfluves of the Tisza, Teresva, Terebla, Rika, Borzhava, and Latoritsa rivers in the south-western foothills of the Ukrainian Carpathians (Zakarpattia province).

The distinct altitudinal vegetation belts include the foothill deciduous forest zone (oak, hornbeam, linden, maple, and beech), however due to climatic factors occurring mostly in the warmer south-western Zakarpattia region, while in the north-eastern part spruce-beech forests prevail. Then the lower mid-altitude mixed forest zone (beech, sycamore, fir and spruce), the upper coniferous forest zone (spruce, fir, and larch, with admixtures of beech and stone pine *Pinus cembra*, the last is endemic for Europe) and the high-altitude subalpine and alpine zones. Depending on the geographical location, in the Ukrainian Carpathians the upper forest limit occurs at altitudes between 1,300 and 1,680 m.a.s.l., made of beech or spruce, formed either by natural or anthropogenic factors. At higher altitudes, coniferous forests are replaced by shrubs (e.g. juniper, green alder, mountain ash) and subalpine open forests formed by dwarf mountain pine (*Pinus mugo*). This vegetation zone has largely been transformed, as the highest parts of subalpine open forests were cut down or burnt in order to expand the area of mountain pastures, which resulted in the expansion of artificial secondary plant communities with an impoverished species composition. At the highest altitudes subalpine mountain meadows cover the ridges and peaks, with rich herbaceous vegetation. Alpine meadows occur in the highest parts of the Ukrainian Carpathians, mainly in Chornohora massif, but also in small clusters in Svydovets, Marmarosh and Chyvychny massifs.

As mentioned above, in the past centuries some natural ecosystems of the Ukrainian Carpathians experienced significant anthropogenic pressures, shaping their landscape and vegetation cover. Initially, the foothill forests were harvested, and used for cattle grazing. Later, with the expansion of settlements and adjoining arable lands, surrounding forests were further reduced. Summer pastures on the alpine meadows “polonynas” were extended by cutting down or burning the subalpine open forests or shrubs forming the upper forest limit.

Later, since the mid-19th century until the World War I, the boom in the oil mining and refining industry (that originates from the Carpathian region) had a significant impact on nature and landscape of the Eastern Carpathians. The rapidly growing demand for timber used for drilling towers, wells, pipelines, tanks and barrels resulted in intensive exploitation of the Carpathian mountain forests. The transportation of timber from remotely located forest complexes required the development of a dense network of forest roads and narrow gauge railways (including 44 railway lines of a total length exceeding 1,400 km solely in the Ukrainian Carpathians), obviously using wooden railway track sleepers. Further, in the areas of clear-cuts, the old-growth natural beech and fir-beech forests were replaced by artificially planted, highly productive but ecologically unstable spruce monocultures.

Fig. 2. Crude oil drilling towers in Borislav, one of the former centres of the world’s oil industry

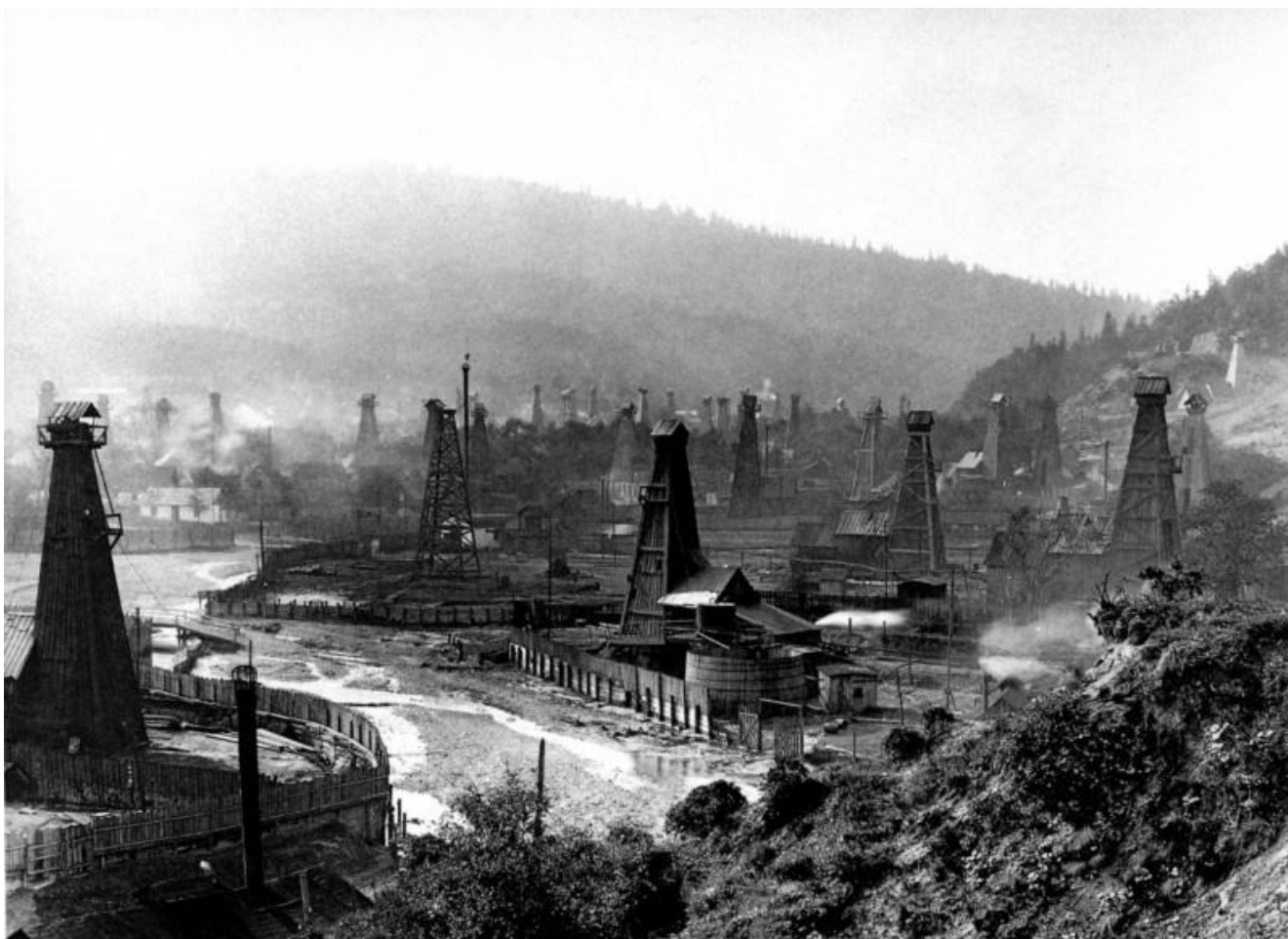


Photo: © R. Nater / Secretariat of the Carpathian Convention

According to 2022 “Ecological passports” of the four administrative regions harbouring the Carpathian region of Ukraine, forests totalled for 2,098.8 thousand ha (thus 37.08 per cent of the region). The forest cover differs among the regions: forests in Zakarpattia region covered 657.8 thousand ha (51.6 per cent of the territory), in Lviv region 629.1 thousand ha (28 per cent), in Ivano-Frankivsk region 558.9 thousand ha (40.1 per cent) and in Chernivtsi region 253.0 thousand ha (31.2 per cent). However, the forest cover in the Carpathian mountain areas is higher than in particular whole regions, and accounts for some 65.5 per cent.

It should be noted, that forests in the mountain areas of the Carpathian region of Ukraine still include 93,777 ha of either primeval (“virgin”), semi-primeval (“quasi-virgin”) or natural forests, of which 44,964 ha grow inside protected areas, including 9,699 ha in specially designated 85 “Virgin Forest Natural Monuments”. Moreover, 15 forest plots totalling for 28,985.97 ha constitute the Ukrainian contribution to the “Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe” transnational WH property (for more details please see part 2.6 of this report).

According to 2017 CC NR, the Ukrainian Carpathians are the habitat of over 20 thousand insect species, 53 Cyclostomata and fish species, 80 species of terrestrial and 65 species of freshwater molluscs (including 40 specific for mountain areas, 18 of which are Carpathian endemics) and more than 435 vertebrate animal species, including 80 mammal, 18 reptile, 16 amphibian species (among them the regionally endemic Carpathian newt), and some 280 bird species (nesting, wintering or passing during their seasonal migrations). The forest complexes of the Carpathian region of Ukraine are the refuge for viable populations of the Carpathian red-deer, brown bear, wolf, lynx, wildcat, as well as two free-roaming herds of the reintroduced European bison (39 individuals in Skolivski Beskydy, and 33 individuals in the Ukrainian part of the Bukovina sub-region, data for 2022).

2.6 Nature protection in the Carpathian region of Ukraine

At the regional level, tasks and measures for the conservation, maintenance, restoration and sustainable use of natural and semi-natural habitats as well as the formation of the ecological network are carried out within the framework of local programs and subprograms, usually developed by regional departments of ecology and natural resources in cooperation with scientific research institutions, and approved by the regional councils. The implementation of adopted regional environmental protection programs is financed by either the State Fund for Environmental Protection or regional funds for environmental protection.

The currently valid regional environmental protection programs in the Carpathian region of Ukraine are:

- Environmental protection program of Zakarpattia region for 2021-2023;
- Environmental protection program of the Ivano-Frankivsk region until 2025;
- Environmental protection program of the Lviv region for 2021-2025.

Moreover, it should be mentioned here that Zakarpattia region adopted also its own regional plan concerning the implementation of the Carpathian Convention (“Plan of measures aimed at implementing the Strategy for the Implementation of the Framework Convention on the Protection and Sustainable Development of the Carpathians for 2008-2020 in Zakarpattia Region”).

2017 CC NR mentioned also several other, previously valid, regional programs, including the 2006 Program of perspective development of nature conservation and ecological network in the Zakarpattia oblast for 2006-2020, the 2007 Regional program of formation of the ecological network of the Lviv oblast for 2007-2015, 2011 and 2015 Programs of environmental protection of Ivano-Frankivsk oblast (including subprograms “Protection of nature reserve fund, formation of ecological network”), and the 2016 Integrated Environmental Protection Program of Chernivtsi oblast “Ecology” for 2016-2018.

According to 2017 CC NR, the development of the Carpathian ecological network at the regional level is implemented in accordance with the regional programs for the formation of the ecological network of Zakarpattia, Ivano-Frankivsk, Lviv and Chernivtsi oblasts. To ensure the continuity of the ecological network of Ukraine and the conservation of biodiversity, work was ongoing to design regional schemes for the formation of the ecological network. The scheme of the Turkiivskyi ecological corridor between the protected areas in Poland and National Nature Park “Skolivski Beskydy” was approved in 2010 by the decision of the Turkiivska District Council, and the scheme of the Bukovina ecological corridor between National Nature Park “Vyzhnytskyi” and National Park “Vânători-Neamț” in Romania has also been adopted.

Further, as mentioned in part 2.3 of this report, particular administrative regions of Ukraine can adopt lists of rare or endangered plant and animal species subject to special protection in these territories. According to 2017 CC NR, the Regional Council of Zakarpattia Region adopted in 2012 the “List of species of animals requiring special protection in Zakarpattia oblast and those included in the Red Data Book of Ukraine”, and in 2014 the “List of vascular plant species and habitats (biotopes) that are subject to special protection in Zakarpattia oblast” (this list contains 231 vascular plant species and 63 habitats, referring also to Habitats Directive, see also Fig. 3).

Fig. 3. Excerpt of the regional list of habitats subject to special protection in Zakarpattia region.

48	Лісовий	Лс7	Вологі ацидофільні осиково-березово-дубові ліси (молінієві діброви)	CR	9190 Старовікові ацидофільні дубові ліси з <i>Quercus robur</i> на піщаних рівнинах / Old acidophilous oak woods with <i>Quercus robur</i> on sandy plains
49	Лісовий	Лс8	Рівнинні дубові ліси з перстачем білим (<i>Potentilla alba</i>)	CR	9110* Євросибірські степові ліси <i>Quercus</i> spp. / Euro-Siberian steppic woods with <i>Quercus</i> spp.
50	Лісовий	Лс9	Паннонські ксеро-термні дубові ліси	EN	91H0* Паннонські ліси з <i>Quercus pubescens</i> / Pannonian woods with <i>Quercus pubescens</i>
51	Лісовий	Лс10	Понтично-паннонські лісостепові дубові ліси	CR	9110* Євросибірські степові ліси <i>Quercus</i> spp. / Euro-Siberian steppic woods with <i>Quercus</i> spp.
52	Лісовий	Лс12	Термофільні паннонсько-балканські скельнодубові ліси	EN	91M0 Паннонсько-балканські ліси з австрійського та скельного дубів / Pannonian-Balkan turkey oak-sessile oak forests
53	Лісовий	Лс20	Середньоєвропейські яворово-букові гірські ліси	VU	9140 Середньоєвропейські субальпійські букові ліси з <i>Acer</i> and <i>Rumex arifolius</i> / Medio-European subalpine beech woods with <i>Acer</i> and <i>Rumex arifolius</i>
54	Лісовий	Лс21	Ліси <i>Tilio-Acerion</i> на схилах, кам'яних осипищах і в ущелинах	VU	9180* Ліси <i>Tilio-Acerion</i> на схилах, кам'яних осипищах і в ущелинах / <i>Tilio-Acerion</i> forests of slopes, scree and ravines

Source: List of habitats (biotopes) subject to special protection on the territory of Zakarpattia region, 2014.

Similarly, the Regional Council of Lviv Region adopted in 2007 the “List of rare plant species that are included in the Red Data Book of Ukraine and are subject to the protection in Lviv oblast and List of rare plant species to be protected within Lviv oblast but not included in the Red Data Book of Ukraine”, and in 2015 “the List of rare plant species that are included in the Red Data Book of Ukraine and are subject to the protection in Lviv oblast and List of rare plant species to be protected within Lviv oblast but not included in the Red Data Book of Ukraine”. Such regional lists were also adopted in Chernivtsi and Ivano-Frankivsk regions (according to the latter, 106 species of plants and fungi and 118 species of animals are under protection in Ivano-Frankivsk region).

As already mentioned, the development of such regional lists and resulting conservation plans for habitats and species (in force for the brown bear and lynx, while the adoption of the European bison species conservation programme is expected in 2022) will not be possible without the involvement of the scientific research institutions.

The leading scientific institutions of key importance for nature protection in the Carpathian region of Ukraine include the Institute of Ecology of the Carpathians of the National Academy of Sciences of Ukraine (further as NAS of Ukraine), M.G. Kholodny Institute of Botany of NAS of Ukraine, I.I. Schmalhausen Institute of Zoology of NAS of Ukraine, State Museum of Natural History of NAS of Ukraine in Lviv, P.S. Pasternak Ukrainian Research Institute of Mountain Forestry in Ivano-Frankivsk, the faculties of biology of Universities in Lviv, Uzhgorod, Ivano-Frankivsk, and Chernivtsi, as well as the “Institute of biology and medicine” of Taras Shevchenko National University of Kyiv.

For example, specialists from the Institute of Ecology of the Carpathians of NAS of Ukraine implemented the “European bison (wisent) reintroduction programme in the Skole Beskids (Ukrainian Carpathians) for the period up to 2015”. This project was implemented in cooperation with the European Bison Friends Society (Poland).

Protected areas in the Carpathian region of Ukraine

2017 CC NR informed that, as at 1 January 2017, the network of protected areas in the Carpathian region of Ukraine (which could mean the total area of the four administrative regions concerned, not only their “Carpathian” parts) consisted of 1,670 NRF territories and objects, totalling for 657.2 thousand ha, including 9 NNPs, “Gorgany” Nature Reserve, and Carpathian BR. In Ivano-Frankivsk region NRF consisted of 517 protected areas and objects totalling for 218,817.18 ha (15.71 per cent of the region’s territory), in Zakarpattia region 465 protected areas and objects totalling for 178,841.22 ha (14.02 per cent), in Chernivtsi region 331 protected areas and objects totalling for 103,598.45 ha (12.8 per cent), and in Lviv region 357 protected areas and objects totalling for 155,898.66 ha (7.14 per cent). According to 2017 CC NR, in 2011-2017 as many as 37 new NRF protected areas and objects were designated in the Carpathian region, some other were extended, in result the total protected area in the region increased by 14.5 thousand ha, and protected areas covered 12.42 per cent of the region.

2017 CC NR also informed that the 2014 State Strategy for Regional Development for the period until 2020 stipulated the extension of NRF also in the Carpathian region, expected to reach 29 per cent of the territory of Ivano-Frankivsk region, 28 per cent of Zakarpattia, 27 per cent of Chernivtsi, and 19.5 per cent of Lviv region.

As at 1 January 2022, the above target indicator values expected to be reached in 2020 have not yet been achieved (in none of the four administrative regions) as the area encompassed by NRF territories and objects accounted for only 15.9 per cent of the territory of Ivano-Frankivsk region, 16.2 per cent of Zakarpattia, 12.9 per cent of Chernivtsi, and 10.0 per cent of Lviv region. However, this protected area coverage indicator would be much higher for all four above administrative regions if calculated solely for their mountainous parts: already in 2018 protected areas accounted for 20.3 per cent of mountainous areas in Ivano-Frankivsk, 19,5 per cent in Zakarpattia, 17,3 per cent in Chernivtsi region, and 20.3 per cent of the mountainous part of Lviv region.

As at October 2022, NFP in the Ukrainian part of the Carpathians includes 796 protected areas and objects of all categories, covering a total area of 487,129 ha, of which 263 areas and objects (with a total area of 175,205 ha) are located in Zakarpattia region, 358 (159,544 ha) in Ivano-Frankivsk region, 87 (101,195 ha) in Lviv region, and 88 (51,185 ha) in Chernivtsi region. As much as 87.8 per cent of the above-mentioned NFP area in the mountainous part of the Carpathian region of Ukraine falls within 22 “large-scale” protected areas (see Table 1), i.e. those with an area exceeding 1,000 ha in size.

The above data shows that the protected area coverage indicator for the mountainous part of the Carpathian region of Ukraine currently accounts for 22.39 per cent. The values of this indicator for particular administrative regions significantly differ, compared to those of 2018: protected areas currently account for 23.73 per cent of mountain areas in Ivano-Frankivsk region, 21.44 per cent in Zakarpattia region, 17.37 per cent in Chernivtsi region, and almost 25.89 per cent of the mountainous part of the Lviv region.

Table 1. Protected areas over 1,000 ha in the mountainous part of the Carpathian region of Ukraine, October 2022.

	Protected area name	IUCN category	designated in	Total area (ha)	Administrative region of Ukraine
1.	Gorgany Nature Reserve	Ia	1996	5,344.2	Ivano-Frankivsk
2.	Carpathian Biosphere Reserve	II	1968	66,417.4	Zakarpattia
3.	Boykivshchyna NNP	II	2019	12,240.0	Lviv
4.	Carpathian NNP	II	1980	50,495.0	Ivano-Frankivsk
5.	Cheremos'kyi NNP	II	2009	7,117.5	Chernivtsi
6.	Hutsulshchyna NNP	II	2002	32,271.0	Ivano-Frankivsk
7.	Korolivski Beskydy NNP	II	2020	8,997.0	Lviv
8.	Skolivski Beskydy NNP	II	1999	32,684.0	Lviv
9.	Synevyr NNP	II	1989	40,777.0	Zakarpattia
10.	Syniohora NNP	II	2009	10,866.0	Ivano-Frankivsk
11.	Uzhanskyi NNP	II	1999	46,147.3	Zakarpattia
12.	Verhovynskyi NNP	II	2010	12,022.9	Ivano-Frankivsk
13.	Vyzhnytskyi NNP	II	1995	11,238.0	Chernivtsi
14.	Zacharovanyi kray NNP	II	2009	6,101.0	Zakarpattia
Large-scale protected areas of IUCN categories Ia and II – subtotal:				342,718.3	
15.	Chernivetskyi RLP	V	2013	21,405.0	Chernivtsi
16.	Dnistrovskyi RLP	V	1993	1,956.0	Ivano-Frankivsk
17.	Hutsulshchyna RLP	V	1996	17,729.0	Ivano-Frankivsk
18.	Nadsianskyi RLP	V	1997	19,428.0	Lviv
19.	Polianytskyi RLP	V	1996	1,032.0	Ivano-Frankivsk
20.	Prytysyanski RLP	V	2009	10,331.0	Zakarpattia
21.	Syniak RLP	V	2011	4,631.0	Zakarpattia
22.	Verkhniodnistrovski Beskydy RLP	V	1997	8,536.0	Lviv
Total:				427,766.3	

As at October 2022, NRF in the Ukrainian part of the Carpathians includes 185 protected areas: 1 nature reserve (*природні заповідник*, IUCN cat. Ia), 1 biosphere reserve (*біосферні заповідник* IUCN cat. II), 12 national nature parks (*національні природні парки* IUCN cat. II), 8 regional landscape parks (*регіональні ландшафтні парки* IUCN cat. V), 62 preservations (*заказники* IUCN cat. IV), 87 natural monuments (*пам'ятки природи* IUCN cat. III) and 14 protected sites (*заповідні урочища* IUCN cat. Ia).

As part of the recent enlargements of the NFP territory in the Ukrainian part of the Carpathians, two new national nature parks (Boykivshchyna and Korolivski Beskydy) in Lviv region as well as many new natural monuments were designated, and some previously existing protected areas were enlarged (including Carpathian Biosphere Reserve in Zakarpattia region and Hutsulshchyna NNP in Ivano-Frankivsk region).

On the other hand, the number of regional landscape parks decreased slightly, as Cheremos'kyi RLP has entirely been incorporated into Cheremos'kyi NNP.

ASCIs of the Emerald Network in the Carpathian region of Ukraine

Among 377 adopted ASCIs constituting the Emerald Network in Ukraine, 30 were designated in the Carpathians, with the total area of 654,374 ha, which accounts for approximately one third of the Carpathian region of Ukraine. Most of these ASCIs (see table 2 and map 5 below) overlap with existing protected areas.

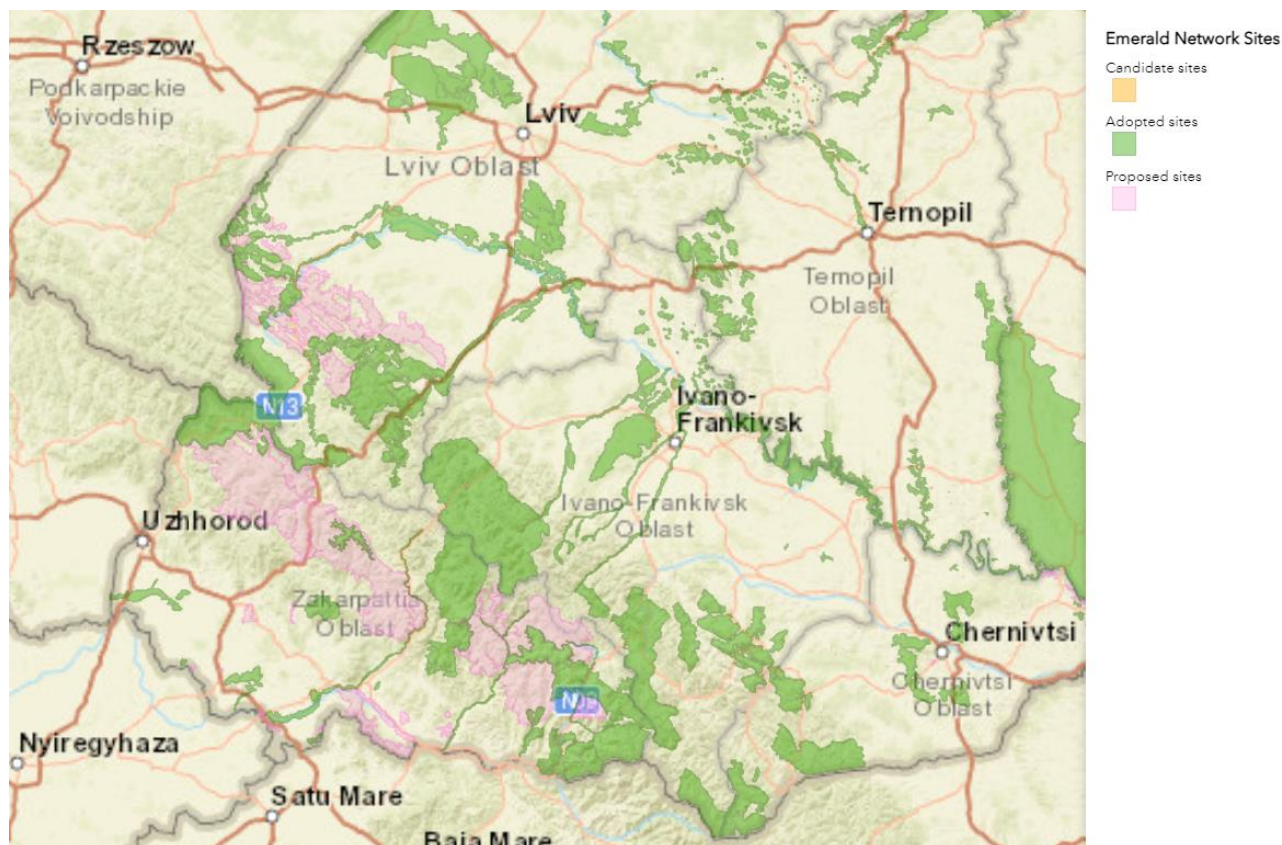
Table 2. List of Areas of Special Conservation Interest (ASCIs) in the Carpathian region of Ukraine

	ASCI site code	ASCI site name	Site area (ha)
1.	UA0000002	Gorgany Nature Reserve	5,362.0
2.	UA0000006	Carpathian Biosphere Reserve	58,296.0
3.	UA0000013	Skolivski Beskydy National Nature Park	35,696.0
4.	UA0000014	Carpathian National Nature Park	50,478.0
5.	UA0000026	Synevyr National Nature Park	40,436.0
6.	UA0000028	Vyzhnytskyi National Nature Park	11,238.0
7.	UA0000032	Uzhanskyi National Nature Park	39,500.0
8.	UA0000033	Hutsulshchyna	39,385.0
9.	UA0000041	Zacharovanyi Krai National Nature Park	6,116.0
10.	UA0000085	Chernivetskyi Regional Landscape Park	21,507.0
11.	UA0000115	Verkhovynskyi	14,494.0
12.	UA0000116	Chornyi Lis	21,415.0
13.	UA0000117	Marmaroski ta Chyvchyno-Hryniavski Hory	25,108.0
14.	UA0000118	Nadsianskyi Regional Landscape Park	19,449.0
15.	UA0000119	Verkhnodnistrovski Beskydy Regional Landscape Park	8,576.0
16.	UA0000125	Cheremoskyi	19,737.0
17.	UA0000174	Dolynsko-Rozhniatynskyi	107,602.0
18.	UA0000176	Boikivshchyna	10,606.0
19.	UA0000247	Slavskyi	7,561.0
20.	UA0000259	Skhidnyi Svydovets	15,138.0
21.	UA0000260	Turova Dacha	1,060.0
22.	UA0000263	Polonyna Borzhava	4,520.0
23.	UA0000325	Opir river valley	6,109.5
24.	UA0000326	Stryi river valley	33,824.9
25.	UA0000332	Dniester river valley in Lviv region	33,628.0
26.	UA0000345	Kobyla	890.0
27.	UA0000357	Limnytsya river valley	3,826.1
28.	UA0000363	Dzhohul	305.5
29.	UA0000365	Bystrytsia of Nadvirna river valley	9,284.7
30.	UA0000374	Shopurka river valley	3,225.3
Total:			654,374.0

Source: Updated list of officially adopted Emerald Network sites (December 2021). T-PVS/PA(2021)11.

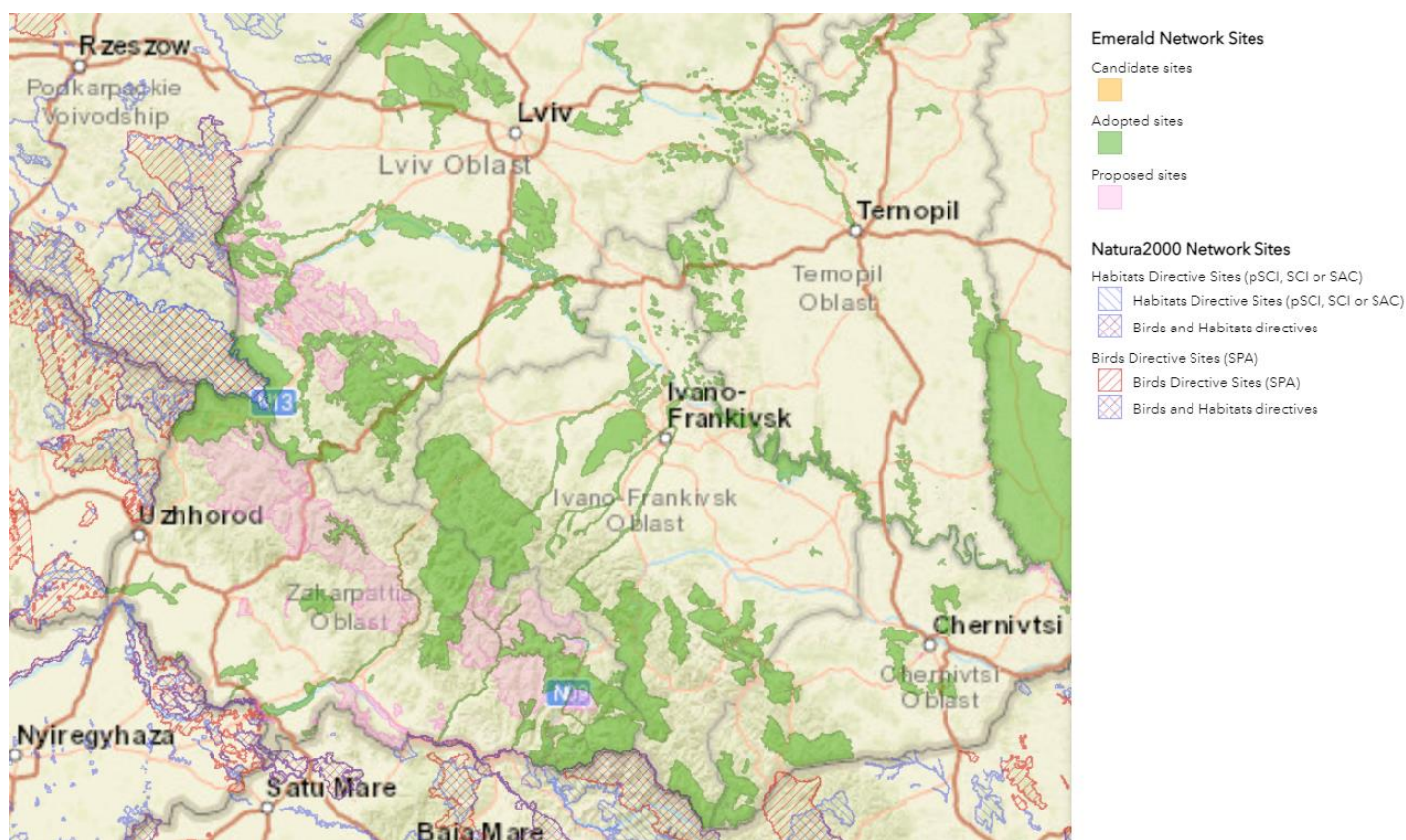
It should be reminded that the above 30 areas located in the Carpathian region of Ukraine successfully passed the biogeographical assessment for inclusion into the Emerald network and were officially granted the ASCIs status endorsed by the Standing Committee to the Bern Convention. Hence, it can be assumed that the same areas located in the Carpathian region of Ukraine will be proposed by Ukraine for their inclusion into the Natura 2000 network. Map 6 below shows ASCIs in Ukraine, and Natura 2000 network sites in border areas of neighbouring EU MSs, which indicates high potential for transboundary cooperation with sites located across the state border.

Map 5. Emerald network in the Carpathian region of Ukraine (adopted sites marked green, proposed marked pink)



Source: EEA Emerald Network Viewer

Map 6. Emerald network in the Carpathian region of Ukraine and Natura 2000 sites in EU MSs.



Source: EEA Emerald Network Viewer

Ramsar sites in the Carpathian region of Ukraine

The Carpathian region of Ukraine harbours eight Ramsar sites, including seven sites designated in 2019:

- Black Bog (15 ha, site No 2389, designated 20 March 2019, Zakarpattia region);
- Lake Synevyr (29 ha, site No 1400, designated 17 November 2003, Zakarpattia region);
- Nadsiania Raised Bog (37 ha, site No 2392, designated 20 March 2019, Lviv region);
- Narcissi Valley (256 ha, site No 2390, designated 20 March 2019, Zakarpattia region);
- Ozirnyi-Brebeneskul (1,656.9 ha, site No 2394, designated 4 April 2019, Zakarpattia region);
- Pohorilets River Headwaters (1,624.6 ha, site No 2397, designated 20 March 2019, Ivano-Frankivsk region);
- Prut River Headwaters (4,935.4 ha, site No 2395, designated 20 March 2019, Ivano-Frankivsk region);
- Romania-Friendship Cave (0.1 ha, site No 2396, designated 20 March 2019, Zakarpattia region).

UNESCO World Heritage Site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe"

In 2007 the World Heritage Committee inscribed²³ the Primeval Beech Forests of the Carpathians (Slovakia and Ukraine) on the World Heritage List, on the basis of criterion (ix), as serial property covering 29,278.9 ha, comprising ten components, including six in the Zakarpattia region of Ukraine: five within the boundaries of the Carpathian BR (Chornohora, Kuziy-Trybushany, Maramarosh, Svydovets, Uholka-Shyrokyi Luh) and one inside Uzhanskyi NNP (Stuzhytsia-Uzhok).

The above six components nominated by Ukraine jointly covered 23,512.5 ha (which accounted for 80.3 per cent of the total area of this transnational WH property), protected by external buffer zones (not subject to nomination) jointly encompassing 34,874.3 ha.

In 2011 this WH property was extended by adding 5 components named “Ancient Beech Forests of Germany” (thus the WH property was renamed as “Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany”). After two next extensions approved by the WH Committee in 2017 and 2021, as at October 2022, the transnational WH property “Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe” includes 94 component parts in 18 countries (Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, France, Germany, Italy, North Macedonia, Poland, Romania, Slovakia, Slovenia, Spain, Switzerland, and Ukraine), with the total area of 98,124.96 ha, surrounded by external buffer zones (not subject to nomination) totalling for 294,716.32 ha.

The extension of the property in 2021 included nine components in Ukraine: “Roztochya” (384.81 ha) in Lviv region (but not in the Carpathians), “Satanivska Dacha” (212.01 ha) in Khmelnytskyi region (thus, not in the Carpathians), as well as seven components in the Carpathians (one in Gorgany Nature Reserve, four in Synevyr NNP, and two in Zacharovanyi Kray NNP) jointly covering 4,876.65 ha, with external buffer zones (not subject to nomination) of the total area of 7,003.92 ha.

In result Ukraine contributed to this transnational WH property with 15 components, encompassing the total area of 28,985.97 ha, which, as of October 2022, accounted for almost 29.54 per cent of the whole “Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe” WH property, involving 18 countries.

²³ <https://whc.unesco.org/en/decisions/1314>

Inventoried and mapping the old-growth and primeval forests of the Carpathians

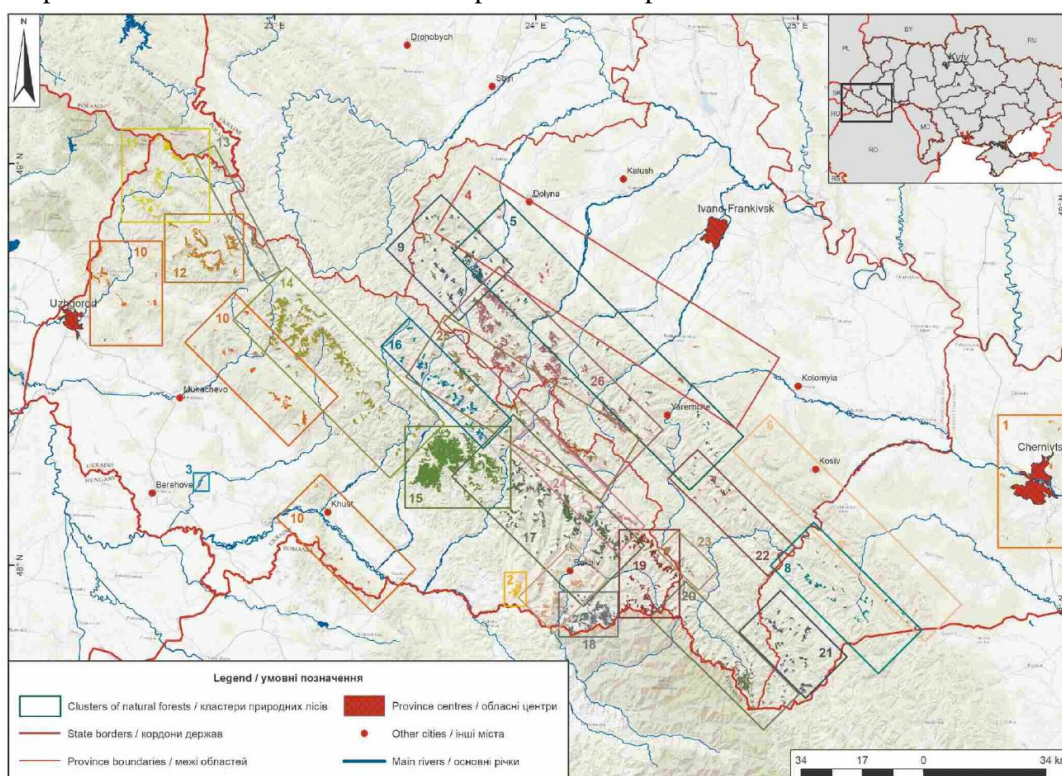
As mentioned in part 2.2. of this report, following the adoption of the “Criteria and Indicators for identification of virgin forests in the Carpathians” by the Parties to the Carpathian Convention in 2014, Ukraine amended some of its laws in 2017, e.g. the concepts of primeval forests, quasi-primeval forests and natural forests were introduced into the Forest Code, and a new national protected area category (“virgin forest natural monument”) with management regime implying total logging ban was added to the Law “On the Nature Reserve Fund of Ukraine”.

In fact, the inventoring of old-growth and primeval forests of the Ukrainian Carpathians began already in 2008-2012, following the pilot identification of the high conservation value forest (HCVF) carried out in 2006-2010. According to 6NR CBD, these works were initiated and executed by a number of NGOs and laid the basis for the development and official adoption of the “Methodology for determining whether forest areas belong to primeval, quasi-primal, and natural forests” in 2018, which incorporated the above Carpathian Convention “Criteria and Indicators” into the Ukrainian legislation as well as forest management and nature conservation practice.

But, 6NR CBD informed that “in early 2018, an agreement concerning a moratorium on logging of virgin forests was reached, aiming to prevent deforestation before the forests obtain the official status according to the approved “Methodology for identifying virgin forests”. However, even prior to the moratorium (during 2014–2017), about 10,000 hectares of plots with characteristics of virgin and old forests were cut down; and after the moratorium was imposed, the permission to cut down 85 plots of a total area of 130 hectares was granted, at total of 150 cleared plots covering 500 hectares (including the plots where permissions were obtained before the moratorium was put into effect)”.

As at 1 January 2018, 93,777 ha of old-growth and primeval forests was preliminarily identified in the Ukrainian Carpathians. In the frame of international projects implemented by the WWF Danube-Carpathian Program and the Ukrainian Society for the Protection of Birds together with the Frankfurt Zoological Society, by 2020 the identification of virgin forests and quasi-virgin forests has practically been completed. As many as 44,964 ha of these forests is located inside protected areas of either the national or local importance.

Map 7. Natural forests of the Ukrainian part of the Carpathians



Source: Smaliychuk, A., Gräbener, U. (Eds) (2018). Natural forests of Ukrainian Carpathians.

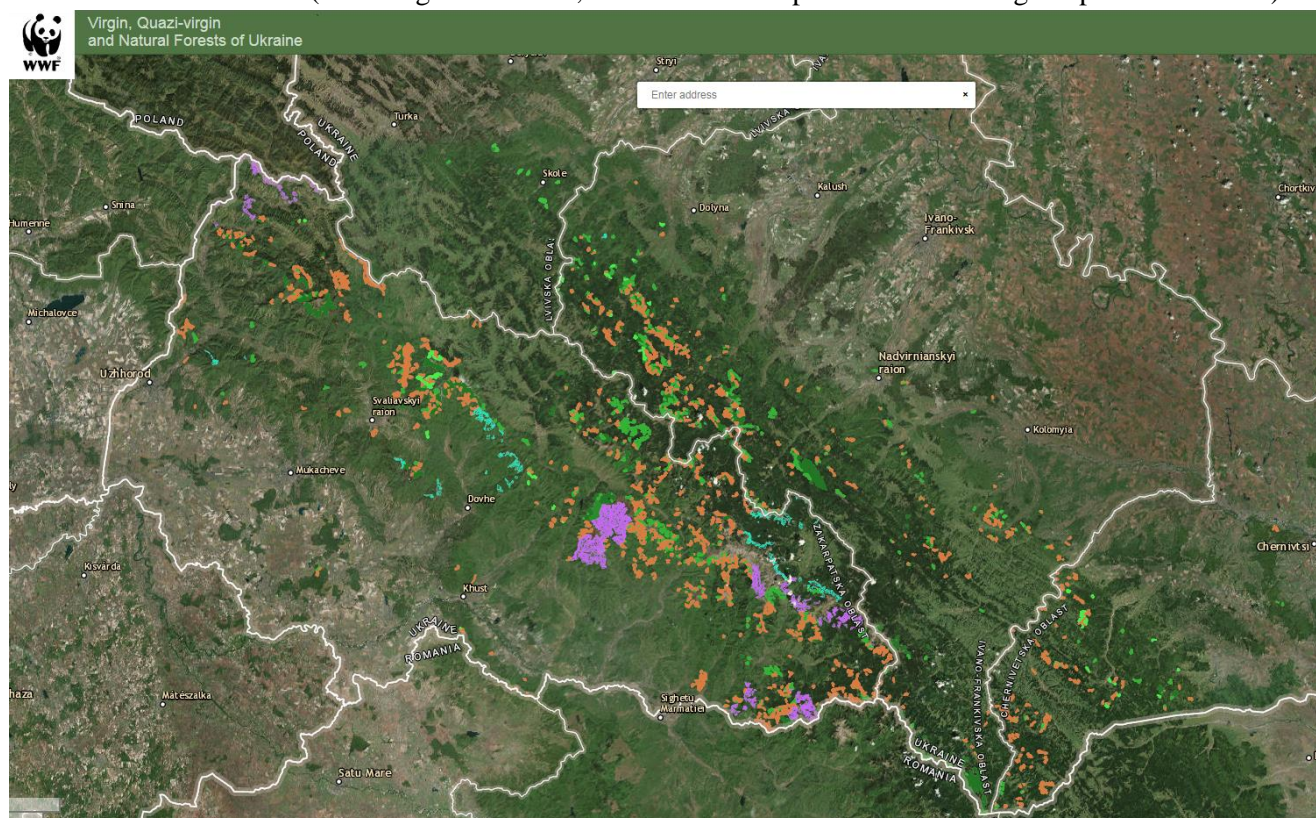
Table 3. Primeval and old-growth forests in large-scale Carpathian protected areas of Ukraine, 2021.

	Protected area name	Total PA area (ha)	Primeval and old-growth forests (ha)
Zakarpattia region			
1.	Carpathian Biosphere Reserve	66,417.4	*20,980.5
2.	Synevyr NNP	40,777.0	*2,865.0
3.	Uzhanskyi NNP	46,147.3	*2,532.0
4.	Zacharovanyi kray NNP	6,101.0	*1,258.1
	Subtotal:	159,442.7	27,635.6
Ivano-Frankivsk region			
5.	Gorgany Nature Reserve	5,344.2	*753.5
6.	Carpathian NNP	50,495.0	2,581.4
7.	Hutsulshchyna NNP	32,271.0	997.0
8.	Verhovynskyi NNP	12,022.9	1,801.2
	Subtotal:	100,133.1	6,133.1
Lviv region			
9.	Boykivshchyna NNP	12,240.0	364.0
10.	Skolivski Beskydy NNP	32,684.0	914.9
	Subtotal:	44,924.0	1,278.9
Chernivtsi region			
11.	Cheremos'kyi NNP	7,117.5	509.2
12.	Vyzhnytskyi NNP	11,238.0	188.0
	Subtotal:	18,355.5	697.2
	Total:	322,855.3	35,744.8

* included in UNESCO World Heritage Site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe"

Data source: Maryshevych, O. (Institute of Ecology of the Carpathians, National Academy of Sciences of Ukraine).

Map 8. WWF online GIS map “Virgin, quasi-virgin and natural forests”, printscreen below shows all preliminarily identified forests (including forests with, without or in the process of receiving the protective status).



Source: Map “Virgin, Quazi-virgin and Natural Forests of Ukraine”²⁴, WWF.

²⁴ <http://gis-wwf.com.ua/#>

Virgin Forest Nature Monuments in the Carpathians

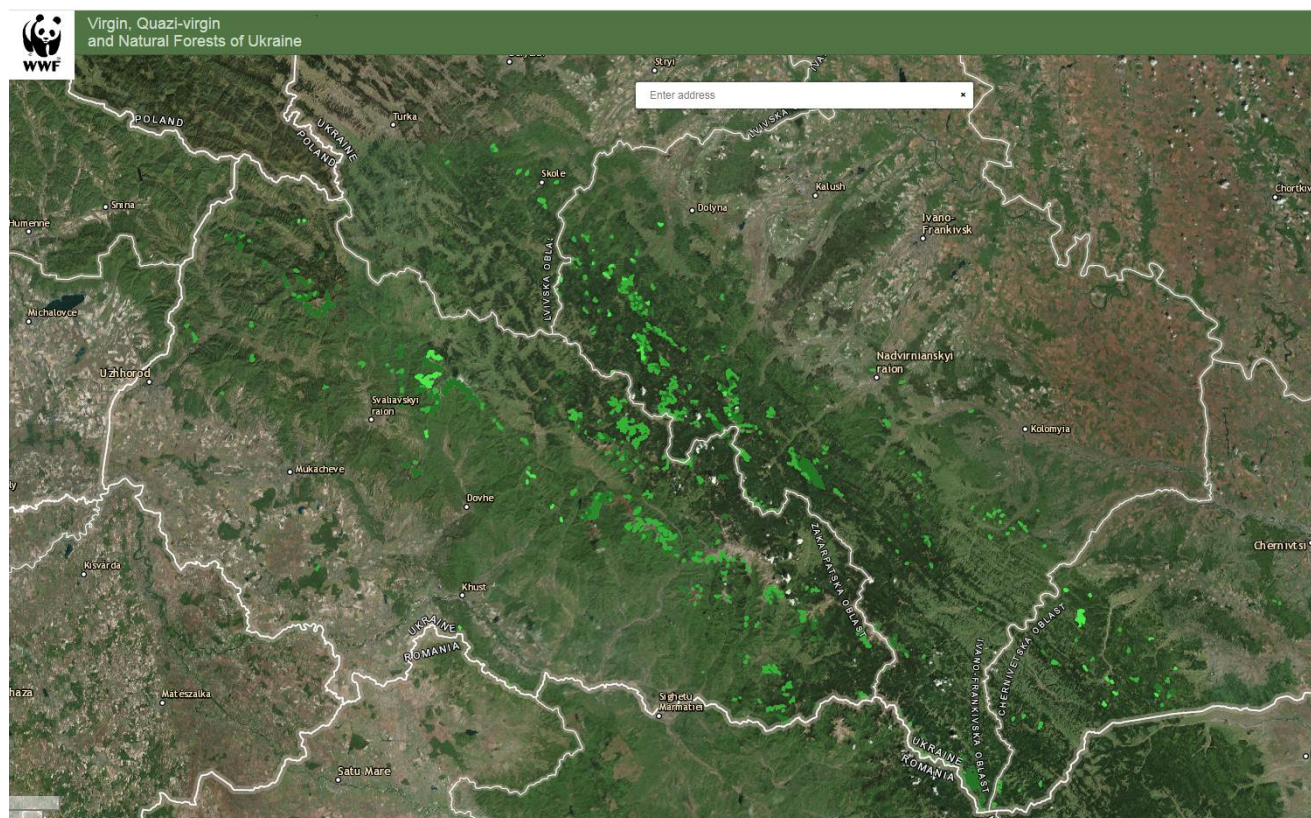
In 2017 the first four virgin forest nature monuments (further as VFNMs) were designated in Lviv region and further three in Zakarpattia region. Few years later, in 2020 six areas in Zakarpattia region and 34 areas in Ivano-Frankivsk region, and in 2021 further 20 areas in Zakarpattia region, and the first 18 areas in Chernivtsi region were designated as VFNMs.

In result, as at 2021, the Carpathian region of Ukraine harboured already 85 VFNMs (all categorized as NMs of local importance) encompassing the total area of 9,688 ha, including 34 VFNMs (4,527.5 ha in total) in Ivano-Frankivsk region, 28 VFNMs (4,327.5 ha) in Zakarpattia region, 18 VFNMs (727.9 ha) in Chernivtsi region, and only 4 VFNMs (105.2 ha) in Lviv region.

VFNMs designated in the Carpathian region of Ukraine vary in size, the smallest ones are around 20 ha in size. 85 VFNMs include 21 small sites between 20 and 30 ha in size, 22 sites between 31 and 60 ha, and 19 sites between 61 and 120 ha. Thus, 43 out of 85 (over 50 per cent) designated VFNMs do not exceed 60 ha in size, and their vast majority (62 of 85, hence almost 73 per cent) does not exceed 120 ha.

Bigger VFNMs were designated only in Ivano-Frankivsk and Zakarpattia regions, where 15 sites are between 121 and 240 ha in size, 4 sites between 241 and 480 ha, and another 4 sites are bigger than 480 ha. The largest VFNMs are “Virgin forests of Ilmyan Forestry” (961.1 ha) and “Virgin forests of Svichiv Forestry” (515 ha) in Ivano-Frankivsk region, as well as “Virgin and quasi-virgin forests of Svalyava Forestry” (822.6 ha) and “Virgin forests of Shcherbylis Forestry” (541 ha) in Zakarpattia region. On the contrary, the largest VFM in Chernivtsi region covers 106.0 ha, and the largest VFM in Lviv region only 34.0 ha.

Map 9. WWF online GIS map “Virgin, quasi-virgin and natural forests”. Printscreen below shows only forests that received the officially confirmed protective status.



Source: Map “Virgin, Quazi-virgin and Natural Forests of Ukraine”²⁵, WWF.

²⁵ <http://gis-wwf.com.ua/#>

It should be noted that the designation of VFNMs in the Carpathian region of Ukraine is obviously in line with the EU Biodiversity Strategy for 2030. Bringing nature back into our lives²⁶, which includes an explicit commitment to grant the legal strict protection to all the EU's remaining primary and old-growth forests (as well as significant areas of e.g. wetland, peatland and grassland ecosystems) and the EU Forest Strategy for 2030²⁷, according to which all remaining primary and old growth forests shall be put under strict legal protection.

Fulfilling the above commitments by the EU MSs will require thorough inventorying and mapping of relevant areas (estimated to encompass only some 3 per cent of EU forested land, mostly occurring in rather small and highly fragmented patches).

It should therefore be emphasized that the tasks concerning inventorying and mapping all remaining primary and old growth forests have already been successfully accomplished in the Carpathian region of Ukraine.

²⁶ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - EU Biodiversity Strategy for 2030 Bringing nature back into our lives COM/2020/380 final
<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0380>

²⁷ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – New EU Forest Strategy for 2030 COM/2021/572 final
<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0572>

3. Damages and losses caused by hostilities (since 24 February 2022)

This part of the report is entirely based on data and information acquired from different publicly available sources, in particular the regular “*Briefings on the environmental damage caused by the Russia’s war of aggression against Ukraine*” published by the Ministry of Environmental Protection and Natural Resources of Ukraine (MEPR). Most of MEPR statements is either quoted “as they were” or used without much editing, but in a shortened manner, in order to keep this part concise.

This report focuses on damages to the natural environment of Ukraine since 24 February 2022. But, it should be reminded that already since 2014 a considerable part of natural ecosystems and protected areas of Ukraine designated in the Autonomous Republic of Crimea, and some parts of Donetsk and Luhansk oblasts remain under the Russian occupation.

In 2018 Ukraine submitted its 6th National Report to CBD, stating that “*Environmental pollution, fires, mine fields threatened biodiversity of eastern Ukrainian regions, which have been appeared under terrorist attack and armed conflict. In Crimea the administration by occupiers does not recognize or support the status of many protected areas, which have been left without proper management*”.

As emphasized by the Central Intelligence Agency²⁸ “*On 24 February 2022, Russia escalated its conflict with Ukraine by invading the country on several fronts in what has become the largest conventional military attack on a sovereign state in Europe since World War II. The invasion has also created Europe’s largest refugee crisis since World War II. As of 27 September, approximately 13.38 million people had fled Ukraine, and 6.98 million people were internally displaced as of 23 August. Over 14,800 civilian casualties had been reported, as of 25 September*”.

However, the natural environment of Ukraine is another, “silent casualty” of war. Hostilities result in direct impact on natural ecosystems, habitats, and landscapes of Ukraine. Damages to the natural ecosystems are mainly caused by forest, steppe, meadow and peatland wildfires caused by shelling (which was particularly visible in late spring 2022, when such habitats are highly flammable), but also in the consequence of chemical pollution of the environment caused by the destruction of industrial plants and technical infrastructure (e.g. pipelines and fuel tanks), damages to hazardous waste storage facilities but also to communal infrastructure (e.g. wastewater treatment plans) and residential houses (in particular those with asbestos roofing), but also due to the large amount of “military waste”.

In its briefings, MEPR always emphasizes the negative effects of environmental pollution directly caused by hostilities. According to the General Staff of the Armed Forces of Ukraine, during the 7 months of the war, the Russian occupying forces lost more than 14,000 pieces of equipment. Destroyed military equipment and ammunition, as well as exploded missiles and aerial bombs, contaminate the soil and groundwater with chemicals, including heavy metals. The destroyed equipment left in rivers and lakes is also dangerous because metal oxidation can lead to water pollution.

According to the State Emergency Service of Ukraine, beginning from 24 February until 12 October 2022, as many as 12, 237,434 explosive devices, including 2,133 aircraft bombs, were neutralized in Ukraine. An area of 73,303 ha was surveyed for explosives. Currently, Ukraine is one of the most mined countries in the world. About 200,000 km², almost a third of the territory of Ukraine, need to be demined. Mining significantly damages the environment. Forests are one of the ecosystems most vulnerable to mining. Detonation of mines leads to forest fires. Even if there is no fire, the fragments of the mines damage the trees. Wild animals often trigger landmines. Confused and frightened, wild animals leave their habitats and migrate massively, while new habitats often are not suitable.

²⁸ <https://www.cia.gov/the-world-factbook/countries/ukraine/#geography>

Large-scale fires at infrastructure and industrial facilities lead to air poisoning with hazardous substances. Pollutants can be carried by winds over long distances. The destruction of buildings and settlements leads to environmental pollution with construction debris and asbestos. The consequences of such pollution for the environment will be felt for years. According to MEPR, the use of phosphorus bombs leads to chemical soil pollution. Phosphorus compounds can remain in the ground for several years, and an excess of phosphates in the soil dramatically harms the growth and development of flora and fauna in the hostilities zone.

As emphasized by MEPR, Russian troops are deliberately striking at the infrastructure for water intake, purification, and supply, as well as sewage treatment facilities. Due to the Russian aggression, water supply and sewerage facilities in the Luhansk, Donetsk, Zaporizhzhia, Kharkiv, and Mykolaiv regions have been significantly damaged. Discharge of untreated sewage impairs the microbiological safety of water and leads to the death of fish and aquatic organisms, which will increase the risk of infectious diseases outbreaks when the air temperature rises. Another serious issue is the contamination of rivers and water reservoirs of Ukraine, coastal waters of the Azov and Black Seas, hydro-technical structures, and seaports with mines and explosive objects. The total area of water areas of Ukraine potentially contaminated with explosive objects is about 16,000 square kilometers.

According to the State Agency of Water Resources of Ukraine, after the start of the full-scale invasion, the state water monitoring was partially paralyzed. Two of the four leading laboratories of the State Water Agency suspended measurements in the north, center, and east of Ukraine - namely, the water monitoring laboratories of the eastern region (in Slovyansk) and the northern region (in Vyshhorod).

3.1 Damages to the natural environment of Ukraine caused directly or indirectly by hostilities

All data and information below is presented in chronological order, which allows to track the damages and losses to the natural environment of Ukraine during the different phases of the current war.

First two weeks of war (24 February - 9 March 2022)

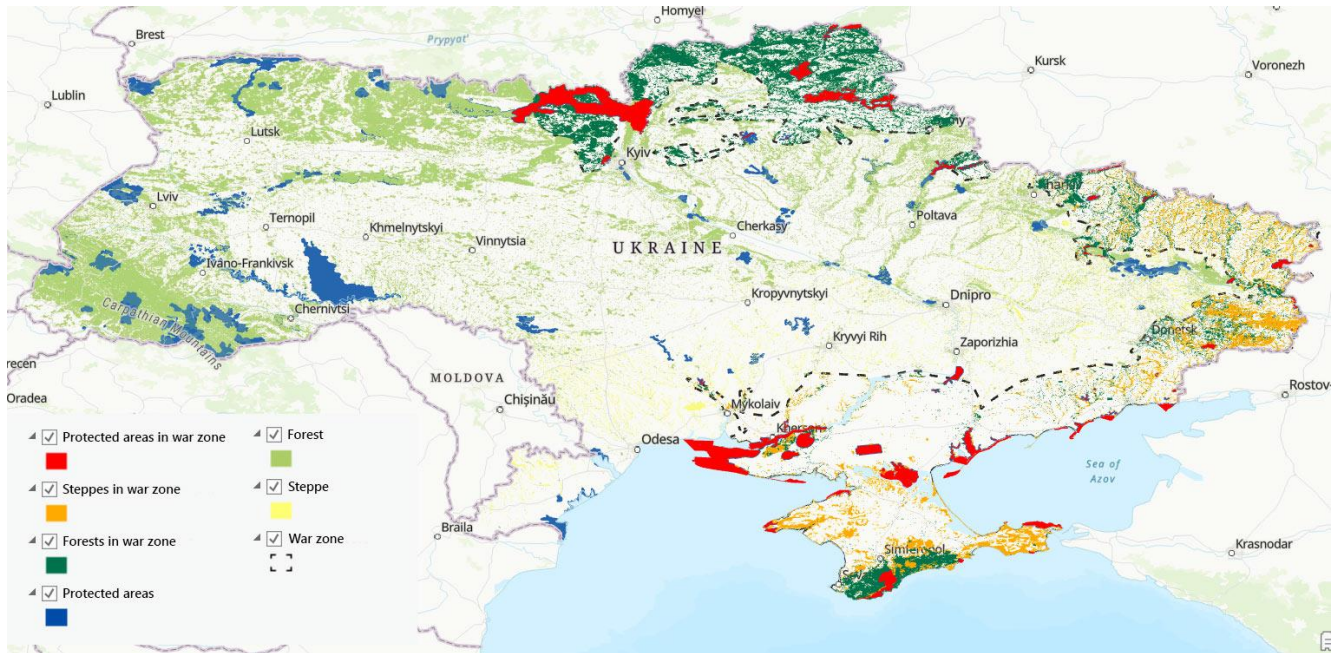
On 10 March 2022 MEPR for the first time informed on the environmental consequences of Russian aggression in Ukraine, and reported that:

- 14 Ramsar sites with an area of 397.7 thousand ha in Ukraine were affected, in particular along the coasts of the Azov and Black Seas and in the lower reaches of the Danube and Dnieper. The Ramsar sites "Kryva Zatoka and Kryva Kosa" in Donbas and the "Water-coastal complex of Cape Opuk" in Crimea (occupied since 2014) were constantly used for conducting military exercises.
- already more than 20 nature and biosphere reserves and national nature parks have suffered losses due to Russian aggression.
- according to preliminary calculations, as of March 1, 2022, the aggressor was conducting military operations on the territory of 900 objects of the nature reserve fund with an area of 12406.6 sq. km (1.24 million ha), which is about a third of the area of the nature reserve fund of Ukraine. About 200 territories of the Emerald Network with an area of 2.9 million ha were under threat of destruction.
- the movement of enemy military equipment, shelling and bombing led to forest fires, which only due to weather conditions have not reached catastrophic proportions. In places where fighting took place, the risk of new fires was constantly high. Extinguishing fires during hostilities and in areas under the current control of the occupiers was impossible, which will result in irreparable damage to the ecosystems of these areas.
- as a result of hostilities, some forests in Kyiv, Chernihiv, Sumy, Luhansk, Donetsk and Kherson oblasts were under the control of the occupiers.

Week No 3 (10-17 March 2022)

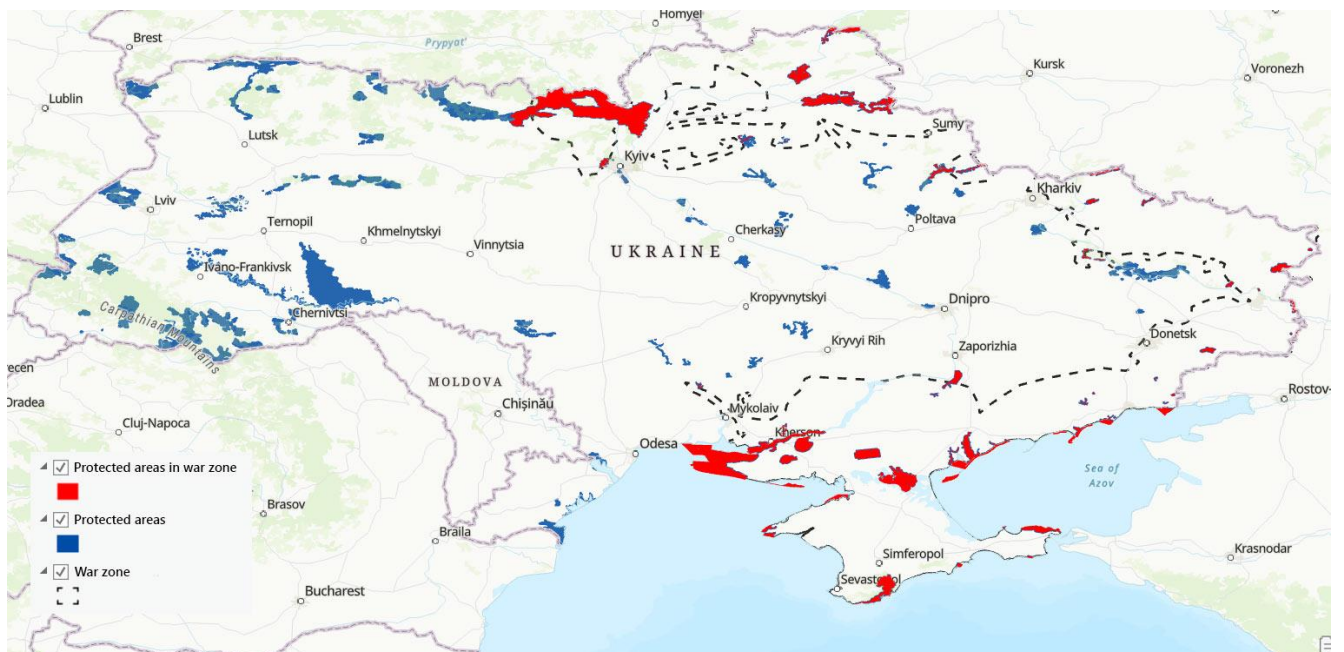
No new information concerning damages to the natural environment in week No 3 was provided by MEPR. But, on 24 March 2022 the Ukrainian Nature Conservation Group published online an article “44% of the most valuable natural areas of Ukraine are covered by war: join the initiative “Save nature in the days of war together”!”²⁹ containing two excellent maps, showing the geographical scope of hostilities versus the geographical distribution of the main natural ecosystems and protected areas of Ukraine.

Map 10. Natural ecosystems and protected areas in the zone of hostilities.



Source: Courtesy of Ukrainian Nature Conservation Group.

Map 11. Protected areas in the zone of hostilities.



Source: Courtesy of Ukrainian Nature Conservation Group.

²⁹ <https://uncg.org.ua/en/most-valuable-natural-areas-of-ukraine-covered-by-war/>

According to the assessment by the Ukrainian Nature Conservation Group, the total area of forests remaining in the war zone, under the temporary control of Russian troops or which was inaccessible to Ukraine, accounted for over 3 million ha. Further, 1,654,736 ha of virgin steppes (approximately 59 per cent of the steppes in Ukraine), and 4,514 ha of shrubs (more than 10 per cent of such areas of Ukraine) remained either in the zone of hostilities or under the control of occupying forces. As much as 44 per cent of the NRF territories was either in the war zone, under the temporary control of Russian troops, or for different reasons inaccessible to Ukraine.

Similarly, no new information was provided by MEPR concerning damages to the natural environment in week No 4 (18-23 March) and week No 5 (24-31 March 2022)

Week No 6 (1-7 April 2022)

MEPR informed that more than one third of the total territory of protected areas was used by Russian troops in military operations against Ukraine, and that dozens of nature and biosphere reserves and national nature parks have suffered extensive damage due to Russian aggression.

Week No 7 (8-14 April 2022)

MEPR informed that the war caused a lot of damage to forestries in Ukraine. Many forestry buildings and vehicles have been damaged and destroyed, and the infrastructure and forests was mined. Part of the forests in Kharkiv, Luhansk, Donetsk, and Kherson oblasts was still under the control of the occupiers.

Week No 8 (15-18 April 2022)

MEPR emphasized that usually the "season of silence" begins in Ukraine in April, as this is the breeding season for many wild animals and birds, while extraneous noise can frighten newborn animals or birds and their parents, and even force adults to leave a nest or burrow. Hence, active hostilities during the "season of silence" pose a threat to wildlife.

Week No 9 (19-22 April 2022)

- "Russian troops have already entered, or conducted military operations in more than one-third of the nation's protected natural areas. Their ecosystems and species have become vulnerable" said Oleksandr Krasnolutsky, Deputy Minister of Environmental Protection and Natural Resources of Ukraine, in a comment to The New York Times.
- on April 20, the Marine Guard of the State Border Guard Service of Ukraine declared a mine danger at the mouth of the Danube river, which is a part of the Danube Delta Transboundary Biosphere Reserve.

Week No 10 (23-27 April 2022)

According to MEPR, in the third decade of April 2022 already 900 protected areas were under threat 27 per cent of protected areas, 1.2 million ha in Ukraine were affected by the war. 200 Emerald Network sites totaling for 2.9 million ha, and 14 Ramsar sites covering the total area of 397.7 thousand ha were under threat of destruction. 20 fires jointly covering an area of 500 ha were detected. At that time already 15 thousand of temporarily displaced persons found shelter at protected areas.

Week No 11 (28 April - 3 May 2022)

MEPR informed that on 28 April a large-scale fire broke out in the floodplains of the Dnipro near the Russian-occupied city of Kherson. The Dnipro floodplains are silted, swampy, flooded areas with rich biodiversity. They are protected within the Lower Dnipro National Nature Park.

Week No 12 (4-10 May 2022)

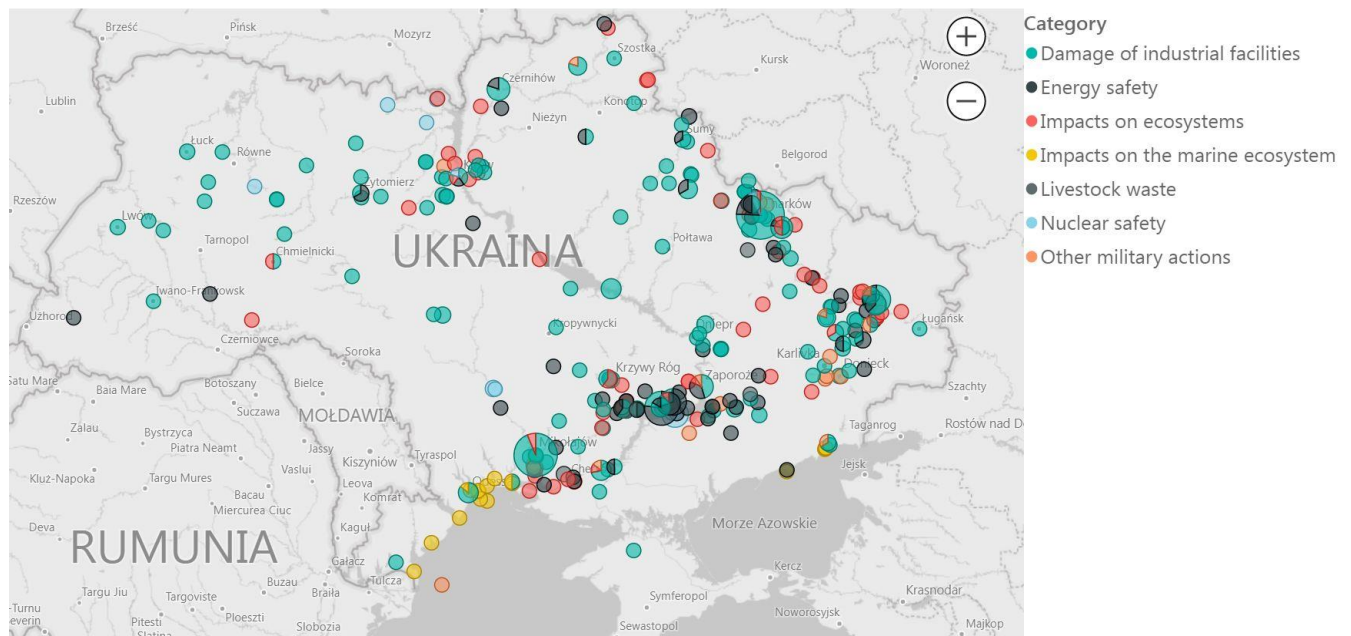
MEPR informed that:

- forest fires continued spreading near the villages of Ivanivka and Geroyске in the temporarily occupied Kherson region.
- according to the European Forest Fire Information System (EFFIS), since 7 May 2022, forest fires have been recorded on an area of 15 ha near the town of Kreminna, Luhansk region. The timely elimination of forest fires was complicated by hostilities and mines.
- the Russian military did not allow forest guards to access the affected territories and eliminate fires.

On 5 May 2022 the Center for Environmental Initiatives “Ecoaction” (an Ukrainian civil society organization based in Kyiv) published online³⁰ an interactive map “Potential environmental impacts caused by Russian aggression in Ukraine”, presenting information collected from open sources (media and official reports).

This map has later been updated, but only in May and June 2022, thus does not contain more recent data.

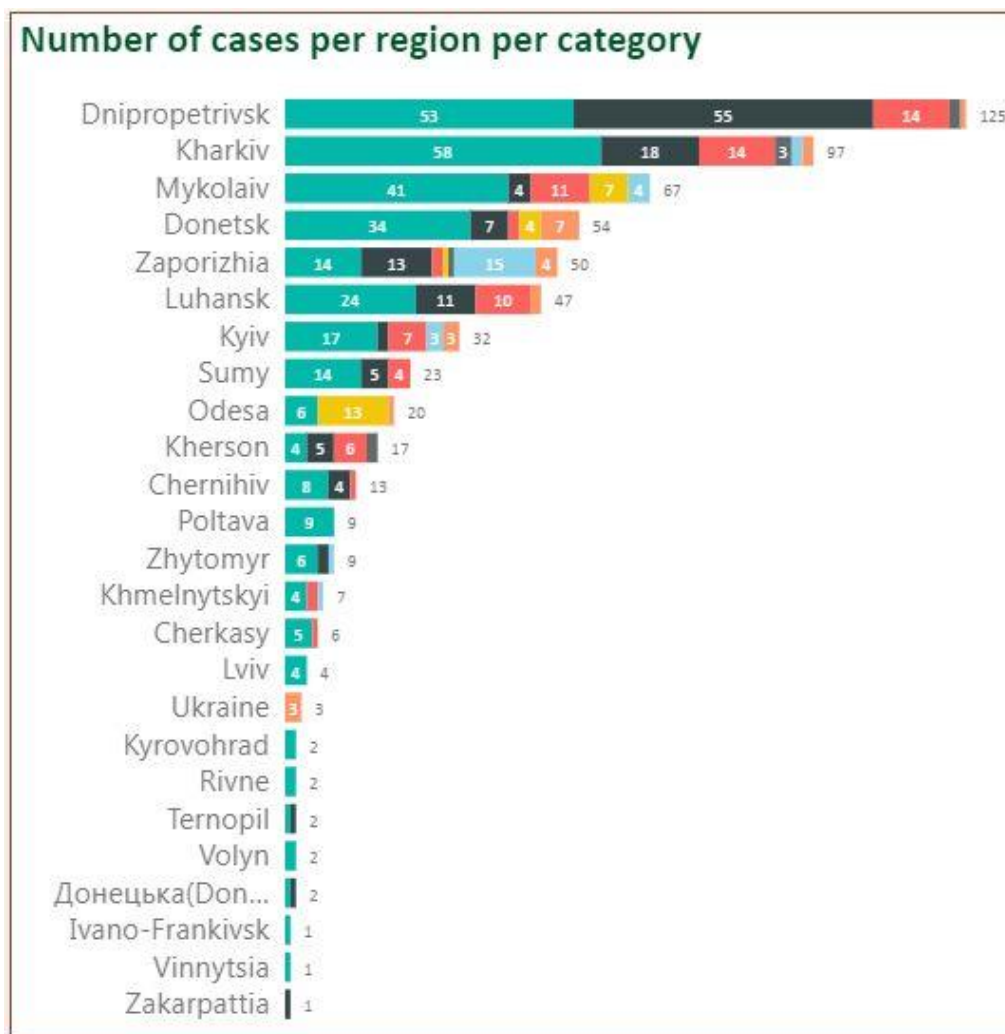
Map 12. Environmental damages in Ukraine, May 2022.



Source: “Potential environmental impacts caused by Russian aggression in Ukraine”, Ecoaction, May 2022.

³⁰ <https://en.ecoaction.org.ua/warmap.html>

Fig. 4. Number of environmental damage cases per region per category, May 2022.



Source: “Potential environmental impacts caused by Russian aggression in Ukraine”, Ecoaction, May 2022.

Week No 13 (11-18 May 2022)

According to MEPR, in mid-May the situation of protected areas slightly improved, compared to the previous month. 812 protected areas thus 20 per cent of all (versus 900 or 27 per cent in late April), 160 Emerald Network sites (versus 200 in late April) were still considered as threatened by destruction. However, the number of threatened 14 Ramsar sites remained unchanged. MEPR also added that 4 biosphere reserves were threatened.

Further, MEPR informed that:

- the forest fires continued spreading in the temporarily occupied Kherson region. The total area of forest fires in the Kherson region was over 4,000 ha. The timely elimination of forest fires was complicated by hostilities and mines.
- on 12 May 2022 a Russian missile hit a protected area of Khortytsia island in Zaporizhi causing a fire.
- in Kharkiv, the Russians destroyed the only plant gene bank in Ukraine. The projectile hit the building of the Institute of Plant Breeding (one of the few such gene banks worldwide), storing the samples of more than 160,000 plant species from around the world. The recovery of a large amount of samples will be impossible.

- Russian troops were fighting in protected areas of international importance, destroying rare and endemic species habitats. Due to the fighting, some unique habitats of endemic species might disappear, while due to the active hostilities, birds can change their migration routes through Ukraine.
- Turkish marine biologists reported that more than 100 dolphins have been washed up on the Turkish coast of the Black Sea, a high number compared to previous years. Earlier, a significant increase in dolphins' deaths was reported by employees of the National Nature Park "Tuzla Estuaries" in the Odesa region. The sonars of Russian warships, which affect the hearing organs of dolphins, have a negative impact on animal health. Having lost orientation, dolphins in panic can throw themselves out to the coast and die. Blocking of maritime traffic in the Black Sea by the Russian fleet, and mining of waters and the seashores prevent scientists from collecting more specific data on the number of affected dolphins.

Week No 14 (19-25 May 2022)

MEPR informed that:

- on 20 May the Russian shelling caused a fire in the Galitsinovsky forest near Mykolaiv.
- on 20 May part of the forest in the Kharkiv region caught fire due to a Russian missile falling on the territory of Chuguiv Forestry.
- forest fires continued in the temporarily occupied Kherson region on the total area of over 4,000 ha, while the timely elimination of forest fires was complicated by hostilities and mines.

Week No 15 (26 May - 1 June 2022)

MEPR informed that:

- as a result of fires caused by Russian attacks, more than 17,000 ha of forests in protected areas of the Luhansk region were damaged.
- as of 30 May, the forest fires in the temporarily occupied Kherson region have been localized, more than 4,500 ha of forests burned out.

Week No 16 (2-8 June 2022)

MEPR informed that:

- due to Russian aggression, dolphins were dying en masse, routes of migratory birds were changing, and nesting sites of rare species were destroyed.
- 14 Ramsar wetlands in Ukraine were still under threat of destruction.
- according to the State Agency of Forest Resources of Ukraine, due to the consequences of hostilities, the number of forest fires in Ukraine in 2022 has increased tenfold compared to 2021. The worst situation was in the East and South (in particular in Kherson region) of Ukraine. The Luhansk, Donetsk, Zaporizhzhia, and Mykolayiv regions suffered the most. Thousands of hectares of forest burned there every day.
- according to the Mykolaiv Regional Department of Forestry and Hunting, on 3-4 June a new fire broke out in the Kinburn Spit (ASCI of the Emerald Network). Fires have already destroyed approximately 300 ha, extinguishing the fire took place in extremely difficult conditions, mainly by local residents and forestry with their own equipment. Extensive areas of forest ecosystems have been lost, and rare species of animals and the unique sand flora of the Kinburn Spit have been damaged.
- on 7 June the Russian artillery shelling caused a forest fire on the territory of the protected Balabanovsky forest in the Mykolaiv region.

Week No 17 (9-15 June 2022)

MEPR informed that:

- according to the State Agency of Forest Resources of Ukraine, the situation with forest fires remained difficult. The area of fires has increased by 99 times compared to the same period in 2021. The fires have already affected 6,460.4 thousand ha. The average area of fire increased by 31 times. The most difficult situation was in the Kherson region, where 4,484 ha was affected by fires. In the Donetsk and Luhansk regions, due to continuous hostilities fires were burning in 2-3 rounds at the sites of 2020 forest fires.
- on 9 June, due to the Russian shelling near the village of Andriyivka (Izium district, Kharkiv region) 2.5 ha of pine forest caught fire, later extinguished by foresters together with the local fire brigade.
- on 12 June, as a result of enemy shelling, a fire broke out in the coniferous forest in the Vysokobirsky forestry (Izium district, Kharkiv region), the fire's area was about 4 ha.

Week No 18 (16-22 June 2022)

MEPR informed that:

- at the end of March, airstrikes and missile attacks on forest areas of the Chernihiv Military Forestry State Enterprise damaged more than 400 ha of forest.
- the State Ecological Inspectorate calculated that the amount of damage caused by the occupiers amounted to more than UAH 3.4 billion.
- on 21 June a Russian missile attack damaged houses on islands in the Danube Delta, inside Danube Delta Transboundary Biosphere Reserve.

Week No 19 (23-29 June 2022)

MEPR informed that:

- according to the NASA satellite systems data, there were at least 37,867 fires recorded in the hostilities zone during 4 months of the war. The area of Ukraine covered by fires was 100,662 ha (1,006 km²). Fires destroyed 36,154 ha of forests and 10,250 ha of grassland ecosystems. The majority of forests affected by fires were located at the outskirts of Severodonetsk, Lyman, Izyum, and Svyatogorsk in the Luhansk and Donetsk regions, as well as at the northern outskirts of Irpin, Bucha, Borodyanka, and Makariv in the Kyiv region.
- on 23 June a pine forest near Zagradyvka in the Kherson region caught fire as a result of a shell hit, but the fire was extinguished.
- on 25 June a Russian missile was shot down by Ukrainian air defense and fell on the forest territory of a nature protection area in the Khmelnytsky region causing a fire, which was extinguished.

Week No 20 (30 June - 6 July 2022)

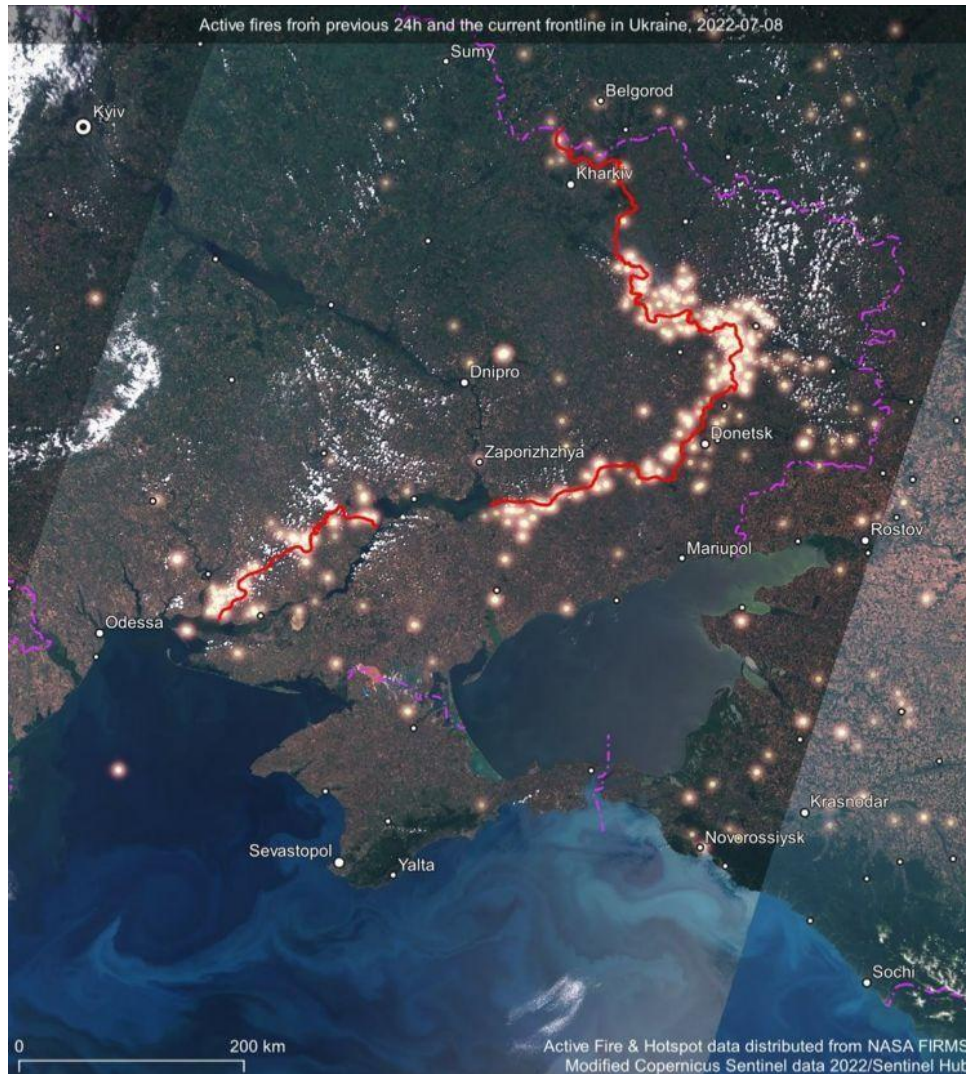
MEPR informed that:

- on 3 July the NASA remote sensing data highlighted an abnormally high number of fires along the front line in the Mykolaiv and Kherson regions. Russian troops launched large-scale artillery strikes. Munitions explosions and the summer heat were catalysts for large fires in fields and forests.
- on 2 July, as a result of Russian shelling, forest plantations on an area of 1 ha caught fire in the forest of Halytsynivska community of the Mykolaiv region. Firefighters extinguished the fire.
- at least 20 species of endemic rare plants in Ukraine were under threat due to the war.

Week No 21 (7-13 July 2022)

MEPR informed that during the past week, numerous fires in forests and fields due to shelling were recorded every day on the territory of Ukraine. The NASA Fire Information for Resource Management System (FIRMS), which detects large fires, recorded the hottest spots along the front line in Ukraine. The highest number of fires was recorded by NASA on 8 July. In particular, satellite images showed large-scale fires in the Luhansk, Donetsk, and part of the Kharkiv regions, as well as in Southern Ukraine - in the Mykolaiv and Kherson regions.

Fig. 5. Larger fires at the frontline detected by NASA FIRMS, 7-8 July 2022.



Source: MEPR / NASA Fire Information for Resource Management System (FIRMS)

MEPR emphasized that the Russians were purposefully shelling the fields in the front-line territories, destroying the harvest on thousands of hectares. Due to constant shelling, it was extremely difficult to put out fires in the de-occupied territories, and the Russians deliberately did not allow extinguishing fires in the occupied areas.

Further, MEPR informed that:

- Russian invaders occupied 13 national parks, 8 nature reserves, and 2 biosphere reserves in Ukraine.
- on 11 July the National Police reported that the occupiers seized the building and changed the management of the Askania Nova Institute of Animal Husbandry of the Steppe Regions in the Kherson region. The Askania-Nova Biosphere Reserve continues to work under occupation. Urgent problems regarding

the maintenance of collections, protection, and preservation of natural and artificial ecosystems of the biosphere reserve were being solved with the help of charitable contributions.

- the occupiers encouraged the management of the Lower Dnipro National Nature Park, located in the Kherson Region, to cooperate. It was reported by a former employee of the park who evacuated to the territory controlled by Ukraine. According to him, the Russians are forcing local fishers to send their catch to Russia. Because of hostilities, it was impossible to exercise state control over the temporarily occupied territories. As a result, a possible reduction in the population of valuable species of fish and a significant decrease in fish resources will occur in the future.
- the SEI specialists calculated the environmental damage caused as a result of the destruction of the Oskil reservoir dam in the Kharkiv region by Russian troops. A projectile hit the hydro-technical structure of the reservoir, causing 76 per cent of the reservoir's water volume to be discharged. As a result, the ecosystem of the reservoir was destroyed, and valuable species of fish and other animals died.

Week No 22 (14-20 July 2022)

MEPR informed that:

- as a result of fires caused by Russian military actions, a large area of forest (more than 9,000 ha) in the territory of Holy Mountains National Nature Park was damaged.
- due to shelling by the Russian troops, the Biloberezhzhia Svyatoslava National Park suffered the most damage among all objects of the nature reserve fund of the Mykolaiv region.
- according to the latest data, 1,840 ha burned on the Kinburn Peninsula. Extinguishing forest fires was complicated by hostilities and minefields in forest areas.
- on 14 July a tragic incident happened in the Narodytskyi specialized forestry in the Zhytomyr region, where a vehicle of the state forest guard hit a mine on a forest road. As a result of the explosion, two foresters were killed, and six more were injured.

Week No 23 (21-27 July 2022)

MEPR informed that:

- according to the Luhansk Regional State Administration, as a result of fires caused by the Russian troops, 28,000 ha of mainly coniferous forests were damaged, in particular the forests around the cities of Severodonetsk, Rubizhne, and Kreminna were affected the most.
- during the war, at least 70 per cent of the forest plantations of the Starokrasnianske Forestry and at least 60 per cent of the forest plantations of the Boroventivske Forestry were damaged.
- significant damage was caused to the flora of the Kremin Forests National Nature Park.
- on 22 July, as a result of Russian shelling, a forest fire broke out on the territory of the Halytsynivska community in the Mykolaiv region.
- the national zoological reserve of national importance "Snake Island" in the Black Sea suffered significant environmental damage due to military operations. Before the war, Snake Island was the most remote and probably the cleanest corner of Ukrainian land, harbouring 197 flowering plant, 71 lichen, 241 bird, 2 reptile, 3 amphibian, and more than 300 invertebrate species, including almost 70 species included in the Red Book of Ukraine. In some years, up to 45 per cent of migratory bird species rested on the island's territory. But, during the occupation of the island by Russian troops, it suffered significant damage, e.g. most of its area was burned. Rockets and other highly toxic munitions exploded on Snake Island for the first time in history.

Week No 24 (28 July - 3 August 2022)

MEPR informed that:

- on 27 July Russian troops carried out a mortar attack on the Shalygin Forestry, located in the Sumy region, right on the border with Russia. Fortunately, the foresters at the forestry premises were not injured.
- on 28 July more than 20 missiles from the S300/S400 anti-aircraft missile systems fell into a forest in the area of the Goncharivska territorial community of the Chernihiv region.
- on 31 July, after a large-scale shelling of the Mykolayiv region, forest fires broke out.
- on 31 July the Russians shelled and damaged the territory of the Desnyansk-Starogutsky National Nature Park in the Sumy region.
- since 31 July the Russian military has been shelling the Kinburn Spit. As a result of the shelling, forest fires broke out in large areas. Despite the hostilities, employees of the state security service of the Kinburn Spit regional landscape park together with the local community, employees of the national park and the forestry participated in extinguishing fires.

On 28 July Mr. Eduard Arustamian, director of the MEPR nature reserve fund and land resources department gave an interview, and informed that both the area of the temporarily occupied territories and the number of institutions and objects of the nature reserve fund located there were constantly changing. In the south, such included e.g. "Biloberezhya Svyatoslava" NNP, Dzharylgatsky NPP, "Askania-Nova" biosphere reserve, Oleshkivski Pisky NPP, Nizhnyodniprovsky NPP, Azov-Syvasky NPP, Kamianska Sich NPP, and Black Sea Biosphere Reserve. The assessment of the current situation and damages in such territories was impossible.

Week No 25 (4-10 August 2022)

MEPR emphasized that due to the war, the Ukrainian environment may be colonized by invasive plant species, as any destruction of local species leads to an increase in the number of invasive species.

Further, MEPR informed that:

- in 2022 the number of forest fires in Ukraine has almost tripled, and the area of fires has increased by 90 times. Fires were burning on the territory of the temporarily occupied Kherson region. According to information from residents, the fires continued for seven days.
- on 4 August, due to hostilities, 5 ha of forest caught fire near Chulakivka, the Kherson region. In total, in 2022, the Kherson region lost more than 5,000 ha of forest due to fires. For a region where the natural reproduction of forests is almost impossible, this is a real ecological disaster.
- on 5 August as a result of shelling, coniferous underlay caught fire twice in the territory of the Halytsynivsky forest in the Mykolaiv region.
- on 9 August the aforementioned forest came under shelling once again. An upper forest fire broke out on an area of 5 ha and a lower forest fire broke out on an area of 10 ha. The fire extinguishing works were complicated by gusty winds, repeated shelling by the occupier, and ammunition that did not explode during the shelling and could detonate from the fire.

Week No 26 (11-17 August 2022)

MEPR informed that:

- on 11 August, due to hostilities, a pine forest caught fire in the Novokakhovske forestry and the Oleshkivske forestry of the Kherson region. 100 ha of pine forest caught fire near the village of Kardashynka due to shelling by the Russian army.
- on 11 August forest areas in the Mykolaiv region were shelled three times, in particular Balabanivske and Halytsynivske forestries. The total area of destroyed forests was 20 ha.
- on 13 August the Russian troops shelled the protected areas in the Shostkinsky district of the Sumy region with mortars and artillery.

- scientists were worried about the future fate of the Kamianska Sich NNP in the Kherson region, containing land plots with unique steppe vegetation (in terms of area, second largest after the Askania-Nova reserve). After the occupation of the region by the Russian invaders, its territory became a front-line zone. The occupiers have set up temporary military camps and have hidden the military vehicles in the park's numerous ravines with flourishing vegetation and springs of fresh water. Trees from the surrounding forests, which should be under protection, were ruthlessly cut down for firewood and to strengthen military fortifications. The park employees were simply not allowed to work - some of them had to evacuate due to threats to their families and personal security.

Week No 27 (18-24 August 2022)

MEPR informed that:

- according to the SEI, the environmental damage of UAH 14.5 billion was caused as a result of forest fires in the Drevlianskyi Nature Reserve in the Zhytomyr region, where as a result of rocket and bomb attacks on the Narodytska territorial community of the Korostensky district of the Zhytomyr region at the beginning of the full-scale invasion, massive forest fires broke out. According to the administration of the reserve, more than 2,100 ha of forest plantations were destroyed by fire.

According to MEPR, in mid-August 2022 (thus six months after the full-scale war began) some 600 thousand ha of forests were either occupied or remained in the hostilities zone, 149 forestry units were still under the Russian occupation, and 2.9 million ha of forests were affected by the war.

Week No 28 (25-31 August 2022)

MEPR informed that:

- according to the State Forestry Agency, the number of forest fires in Ukraine compared to the same period last year increased by 2.3 times, and the area of wildfires increased by 77 times. In 70 per cent of cases, the forest fires this year were caused by active hostilities, shelling, cruise missiles, mine explosions, etc.
- on 25 August fallen conifer needles, forest plantations, and a building on the territory of the Halytsynivsky forest in the Mykolaiv region were destroyed by Russian shelling.
- on 25 August the Shalyginska territorial community in the Sumy region was shelled, probably with multiple rocket launchers with phosphorus projectiles, 20 explosions were recorded. After surveying, the remains of projectiles and a forest fire were discovered in the area of the nature reserve.
- a significant area of this year's forest fires in the Kyiv region and Chernihiv region (more than 1.2 thousand ha) was mainly caused by the mining of forest areas. The occupiers left behind not only thousands of ordinary mines but also hundreds of special explosive devices, which purposefully caused forest fires and made timely extinguishing impossible. Foresters could not risk people and go deep into unmined territory where forest fires occurred. They were forced to choose the tactics of localizing fires along the perimeter of the fire, preventing the fire from spreading to the areas where the State Emergency Service and the Armed Forces of Ukraine have already cleared mines. The neutralization of explosive objects continued in the Kyiv region. To prevent forest fires, forestries set up almost 10.6 km of firebreaks and barriers and 28,400 km of mineralized strips.
- according to MEPR, in the end of August 2022 the situation of protected areas was similar as in mid-May 2022, 812 protected areas (20 per cent of all) were still threatened. 12 NNPs, 8 nature reserves and 2 biosphere reserves were still under the Russian occupation.

On 23 August experts from the Ukrainian Society for the Protection of Birds (USPB) and BirdLife Europe & Central Asia published an article³¹ on the impact of the Russian invasion on wild birds and their habitats in Ukraine.

³¹ <https://www.birdlife.org/news/2022/08/23/impact-russian-invasion-ukraine-wild-birds-habitats/>

According to the State Forest Resources Agency of Ukraine presentation delivered in August 2022, military activities of various intensities took place on the territory of 2.9 million ha of forest lands. 110 forestry real estates and numerous equipment were destroyed and damaged.

Map 13. Forest areas in Ukraine directly affected by the war.



Source: speech delivered on behalf of the State Forest Resources Agency of Ukraine on 30 August 2022.

Week No 29 (1-7 September 2022)

MEPR informed that:

- a large part of Ukrainian forests remains contaminated with mines. On 2 September foresters hit a mine in the Zhytomyr region on the territory of the Narodnytsky Forestry. As a result of the explosion, one employee died, and one was in intensive care.
- on 2 September the occupiers shelled the Velykomykhailivska community in the Dnipropetrovsk region. As a result of the attack, a fire broke out in the forest on an area of 4 hectares.
- on 2 September a forest fire broke out in the Krasnopilska community of the Sumy region due to shelling by the occupiers. The wind was blowing in the direction of the border with Russia, so the fire spread to the Russian positions.
- on 3 September the occupiers shelled the territory of the Great Meadow National Nature Park in the Zaporizhzhia region. The attack caused fires on the islands of Mali and Velyki Kuchugury in the Kakhovske water reservoir. The park is of national importance as a home to protected birds' nesting places and rare plant habitats.
- hostilities of varying intensity were conducted on 3 million hectares of forests; now the war affected 600,000 ha. The main consequences of military aggression for forestry are fires, contamination with explosive objects, and damage to premises and equipment.

Week No 30 (8-14 September 2022)

MEPR informed that:

- thanks to the efforts of the Armed Forces of Ukraine, 150,000 ha of forests have been deoccupied in the Kharkiv region: a large part of the Kupyansk, Chuguyevo-Babachansk, Balakliya, Izyum, and Vovchansk forestries.
- Dvorichanskyi NNP Velykoburlutskyi Steppe RLP and Izyumska Luka RLP were also liberated from the Russian occupation. Dvorichanskyi and Velykoburlutskyi parks were created to preserve marmots in Ukraine, practically extinct in Ukraine few decades ago. Later these parks became donors for the reintroduction of marmots in many districts of the Kharkiv region and other regions of Ukraine.
- on 9 September fires broke out after Russian shelling on the territory of the Berezneguvate forestry in the Mykolaiv region. Firefighters extinguished the fires on a total area of 2.5 ha, of which 1.5 ha was a deciduous forest and 1 ha was a coniferous forest.
- according to the SEI, the 31 July shelling by Russian troops of the outskirts of the Stara Huta village (Shostka district, Sumy region) destroyed 203 pines and birches in the Desnyansko-Starogutsky National Park, of significant nature conservation and scientific research value.
- the state enterprise "Trostyanets Forestry" in the Sumy region sustained damage caused by the Russian invaders: its facilities were burned, equipment was looted, workers were captured, and forests were mined. 117 units of movable and immovable property worth more than UAH 22 million were damaged. 1,816 units of property worth over UAH 10.87 million were destroyed. The central office of the forestry, administrative buildings, garages, and processing shop were destroyed.

Week No 31 (15-21 September 2022)

MEPR informed that:

- according to the SEI report, 3,708 ha of the protected area of the Kinburn Peninsula in the Mykolaiv region burned down due to Russian military activities. The Kinburn Peninsula separates the Black Sea and the Dnieper-Boh estuary, that hosts several nature conservation objects: two areas of the Black Sea Biosphere Reserve (Volyzhyn Forest and Solonoozerna), the Ivory Coast of Sviatoslav National Nature Park, the Kinburn Spit RLP, the Yagorlytska Bay wetlands, etc. The peninsula is an integral part of the "environmental corridor" of migration routes of a vast number of birds. According to scientists, about 300 species of birds can be found there because this territory has favorable conditions for their nesting, seasonal concentrations, and wintering. In 2001, a record number of rare pink pelicans in Eastern Europe was recorded in the Kinburn Spit. Currently, the Kinburn Peninsula is a unique ecosystem, which is constantly and mercilessly affected by fires caused by military aggression.
- according to media reports, the Russian army aircraft were harming animals living in the unique steppe reserve of Askania Nova. To avoid being hit by Ukrainian air defense forces, the Russian army planes fly at low altitudes, which is very frightening to ungulates. Ukrainian legislation obliges any air transport to stay at the height of at least two kilometers above nature reserves, but the Russian military violates all rules of war.

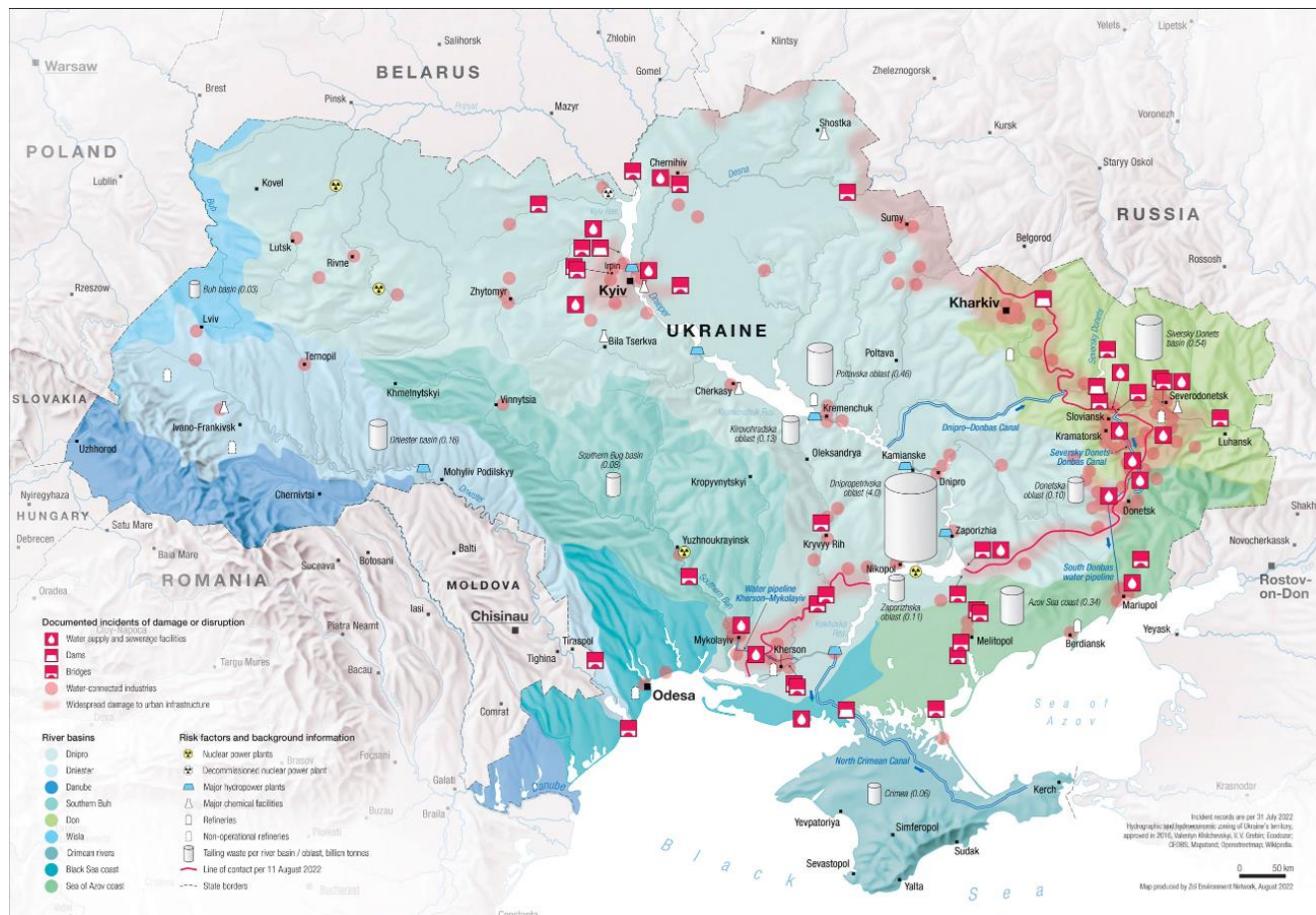
Week No 32 (22-28 September 2022)

MEPR informed that:

- 3 national natural parks of the Kharkiv region - Dvorichanskyi, Gomilshanskyi forests, and Slobozhanskyi – were still threatened.
- 90 forest fires were recorded on the territory of forestries of the Kharkiv region on an area of 126 ha.
- according to the media reports, the only colony of beavers on the banks of the Kakhovsky Reservoir (consisting of 8-10 families, thus up to eighty beavers) in the Kherson region was under threat of extinction, due to the operation of the Russian anti-aircraft defense unit in Mylivska Balka. Local residents no longer observed beavers, that either died or moved to a place where people would not disturb them.

In September 2022 the damages to water infrastructure, including water supply and sewerage facilities of Ukraine were briefly summarized in “Ukraine conflict environmental briefing. 2. Water” joint online report published online ³² by the Conflict and Environment Observatory (CEOS) and Zoï Environment Network.

Map 14. Documented incidents of damage to water infrastructure and or disruption of drinking water supplies in Ukraine (until 31 July 2022).



Source: Map produced by Zoï Environment Network, August 2022.

Week No 33 (29 September – 5 October 2022)

According to MEPR, seven months after the Russian invasion began, over 2,000 cases of environmental damage were recorded, 20 per cent of protected areas and 2.9 million ha of the Emerald Network in Ukraine were still under the threat of destruction.

MEPR also informed that:

- according to the SEI report, from 1 June to 29 August, as a result of Russian shelling, 25 fires were recorded in the Halytsynivskiyi, Balabanivka, and Lymany forests, on the total area of 211.73 ha.
- a temporary ban on visiting forests was in effect in almost all regions of Ukraine. Partial demining has already taken place in the territories where hostilities were conducted. But complete demining of the forest territories can take years. Violation of this ban can cost lives: on 1 October a car was blown up by a mine near the village of Shestovytsia in the Chernihiv region. All four people who were in the car died.

³² <https://ceobs.org/ukraine-conflict-environmental-briefing-water/>

- Tuzly Lagoons NNP in the Odesa region is the only national park in Ukraine with access to the sea that was not under occupation. All other national parks that have access to the Black or Azov seas were (at that time) under occupation.

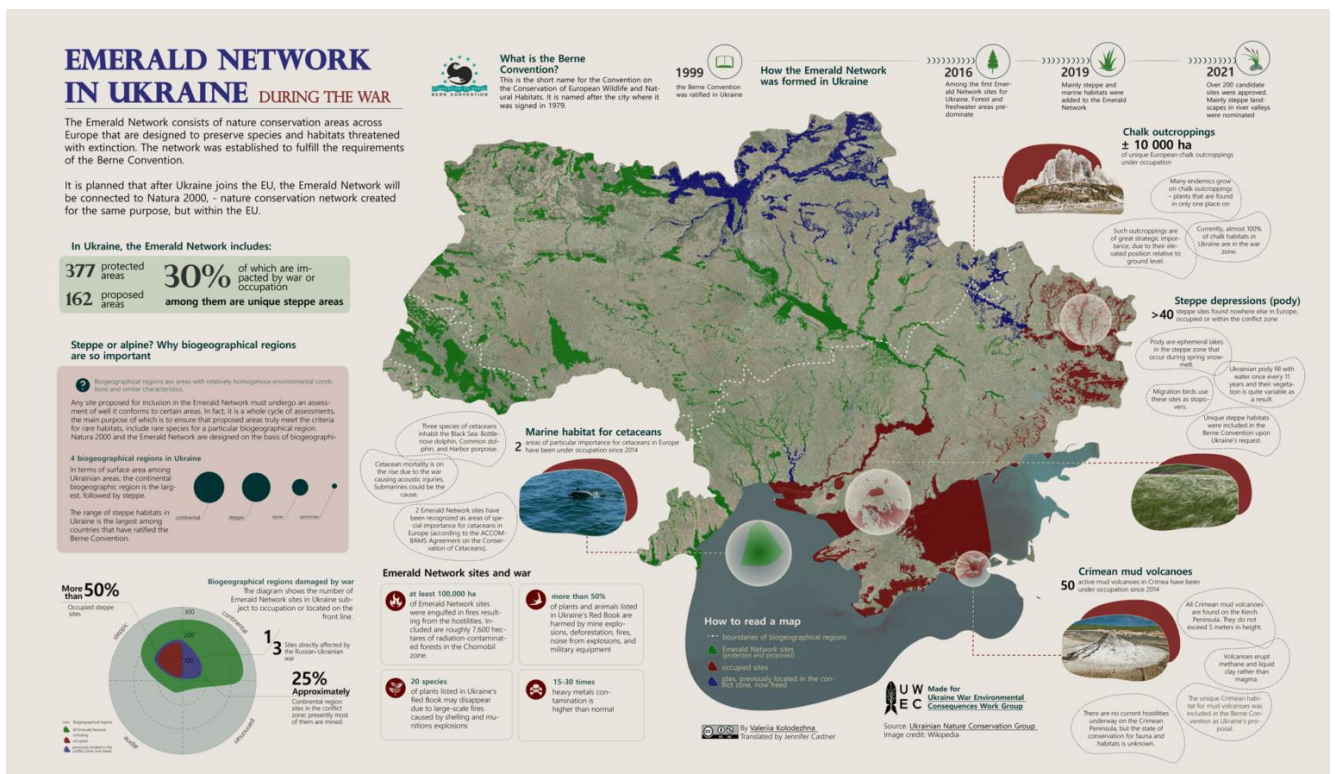
Week No 34 (6-12 October 2022)

MEPR informed that:

- the full-scale Russian aggression against Ukraine caused significant losses to forests in the Donetsk region. According to the preliminary data from the Donetsk Regional Department of Forestry and Hunting, the occupiers destroyed more than 15,000 ha of forest. As a result of the recent successful counteroffensive of the Ukrainian Armed Forces in the north of the Donetsk region, 60,000 hectares of forests were liberated.
- the occupiers destroyed the forest seed selection center built in 2021 near Lyman, the Donetsk region. The pre-war capacities of this seed center were enough to gradually restore forests not only in the Donetsk region but also in the Luhansk region.
- during the Russian attack on Zaporizhzhia in the morning of October 11, most of the rockets hit the protected island of Khortytsia. Some of the missiles hit the forest strip. One missile hit the island’s rock.

On 9 October 2022 the Ukraine War Environmental Consequences Work Group (UWEC) published an article on the situation of the Emerald Network sites during the current phase of the armed conflict.

Fig. 6. Infographic showing sites of the Emerald Network of Ukraine (377 adopted ASCIs and 162 proposed sites), including sites still under occupation (marked red), previously located in the conflict zone, recently freed (marked blue), and remaining non-affected sites (marked green).



Source: infographic by Valeriia Kolodezhna, article “Emerald network of Ukraine”³³ posted online on 9 October 2022 by the Ukraine War Environmental Consequences Work Group (UWEC)

³³ <https://uwecworkgroup.info/emerald-network-in-ukraine-draft/#more-2026>

3.2 Losses of nature protection services in the Carpathian region caused by hostilities

As the Carpathian region has been, at least until late October 2022, still considered the “safest” part of Ukraine, least affected by direct impacts of hostilities of the Russian aggression (e.g. only sporadically targeted by long-range missile shelling), its critical infrastructure (including not only power stations and heating plants, oil and gas pipelines, airports and railroads but also water intake and wastewater treatment facilities) and industrial plants were not destroyed, neither its environment nor natural areas were damaged.

However, it does not mean that the Carpathian region of Ukraine did not suffer after 24 February 2022, and that the state environmental services in this region can still operate in regular “business as usual” mode. Firstly, the outbreak of war caused immediate breaks in supplies of basic resources (e.g. liquid fuels, electric energy) that equally disorganized the life of civilians and the operation of state services. Another consequence of the above shortages is the currently (in autumn 2022) still growing pressure by the local population on the state forests and protected area administrations for increased harvesting of the locally available natural resources, in particular firewood. Confronted with more urgent needs, funding for nature conservation coming from the central state budget drastically decreased, while the parks’ own revenues from different paid services simultaneously declined.

Moreover, the Carpathian region of Ukraine accommodated a large number of IDPs (until 16 October 2022, according to official data some 800 thousand people were formally registered as IDPs, while their actual number can be much higher). Some part of IDPs found refuge in protected areas and were accommodated in facilities provided by protected areas, some of which were temporarily adopted for the above purpose (often at the expense of the protected area administration), or in their employees’ private houses.

Further, some part of vehicles and field equipment at the disposal of the local state environmental services was in early 2022 handed over for the needs of the Armed Forces and/or the territorial defence. Last, but not least, another significant limitation of operational capacities results from the mobilization of staff, including highly trained and most experienced professionals.

However, not all state environmental services in Ukraine were equally affected. For example, the employees of the State Ecological Inspection of Ukraine (including its subordinate branches in all four administrative regions harbouring the Carpathian region of Ukraine) and civil servants of the regional departments of ecology and natural resources subordinate to the head of the regional state administration have the status of state officers, and cannot be subject to mobilization. They can they only volunteer to join the military (which was the case of e.g. three civil servants of the Lviv regional department of ecology and natural resources, who joined the Armed Forces).

Secondly, not all state environmental services operating at the regional level are equipped with company cars and field equipment that could be handed over or requisitioned for the needs of the armed forces and territorial defense, or administer suitable buildings that could accommodate IDPs. Only the protected area administrations have such on disposal, and could provide such.

Furthermore, for public safety reasons not all state environmental services can openly disclose information on their losses and resulting decrease of their operational capacities, in particular not the services responsible for the monitoring of air and water quality, as such information must be classified during the state of war. In particular during the war with the enemy whose armed forces prefer to target and destroy civilian critical infrastructure, even in remote regions located far beyond the front, rather than openly fight in the battlefield.

Last, but not least, despite the fact that this report was commissioned by the Ministry of Climate and Environment of Poland, acting under the Polish Presidency in the Carpathian Convention, neither the Ukrainian state services (including e.g. the State Ecological Inspection of Ukraine or the State Emergency Service of Ukraine) nor the state agencies (e.g. the State Forest Resources Agency of Ukraine) were obliged or authorized to provide information and data to its authors.

Survey conducted in selected protected areas in the Ukrainian part of the Carpathians

Instead, for the purposes of this report, selected protected area administrations operating in the mountainous part of the Carpathian region of Ukraine (as the institutions directly in charge for the management of its protected parts and implementation of nature protection measures on the ground, simultaneously not responsible for any sort of critical infrastructure) were contacted and inquired to inform on their current situation, in particular losses and limitations resulting from the current military conflict.

Only those protected areas were inquired which have operational administrations, buildings and infrastructure that can be used for accommodating IDPs, as well as vehicles and equipment that could have been possibly shared with the military and territorial defence units.

It should be noted that (as at October 2022) not all protected areas in the Ukrainian part of the Carpathians are fully-fledged in terms of operational capacities. Namely, six out of eight regional landscape parks (usually financed from the regional environmental protection funds) designated in the mountainous part of the Carpathian region of Ukraine (Chernivetskyi, Dnistrovskyi, Hutsulshchyna, Polianytskyi, Prytysyanski and Syniak RLP) have either very limited operational capacities (e.g. staff consisting of few people, only few or even no buildings, park facilities and vehicles at disposal) or no administration at all. In fact, not all national nature parks are well equipped or fully staffed, e.g. Korolivski Beskydy NNP recently (2020) designated in Lviv region.

Due to the above, the survey was conducted only among the administrations of 16 protected areas (Gorgany Nature Reserve, Carpathian BR, all twelve NNPs, and two RLPs: Nadsianskyi and Verkhniodnistrovski Beskydy) that could potentially suffer considerable losses, and report on such.

The survey was based on a questionnaire, circulated in Ukrainian language version, containing the following 22 questions:

1. Total number of employees of the institution
2. The number of employees of the ecosystem protection department
3. How is the institution financed? (which items of the budget are financed, and for which items funds are not allocated?)
4. By how many percent has the budget of the institution approved for 2022 been reduced and for which items?
5. Did the institution receive funds from the regional environmental protection fund for projects that were approved for funding in 2022?
6. How does the institution solve issues of funding for field research and ecosystem protection (for example, funds for fuel)?
7. Were the institution's needs for fuel in 2021 covered by budget funding?
8. Has the number of visitors to the territory of the Nature Reserve Fund (NRF) institution decreased compared to the last year (main trends)?
9. How much has the revenue to the budget for the provision of paid services decreased compared to 2021? (in percentage)
10. Have the limits on the use of natural resources within the boundaries of the NRF institution, in particular the volume of forest resources, been increased?
11. Were there appeals from the side of local self-government bodies to the administration of the NRF institution concerning the increase in the volume of harvested forest resources?
12. How many people live in areas that border the territory of the NRF institution and what type of fuel is used?
13. Has the scale of unauthorized logging on the territory of the NRF increased, compared to previous years?
14. Has the incidence of poaching on the territory of the NRF increased compared to previous years?

15. How many cars (passenger cars, trucks) and other vehicles (tractors, cranes, etc.) had the institution at disposal until 24 February 2022?
16. Has the institution provided vehicles, computer equipment, uniforms, etc. for the needs of the military? (please specify quantities)
17. How many employees of the institution were mobilized to the ranks of the Armed Forces of Ukraine or territorial defense? Employees of which departments (scientific, ecosystem protection, administration, etc.) were mobilized?
18. Did the institution accommodate temporarily displaced persons using its premises (number)?
19. How was the financing of the stay of temporarily displaced persons ensured and who helped/is helping?
20. Who is currently helping the institution in solving scientific and organizational problems ? (please name projects, funds)
21. Which main areas of activity of the institution are already in need of external financial assistance, or providing necessary:
 - vehicles (quantity, cars/trucks)
 - computer equipment (type, quantity)
 - laboratory equipment (item name, quantity)
 - uniforms for employees (quantity)
 - other
22. Information on other losses of the institution related to the Russian aggression.

Outcomes of the survey - summary of responses to the questionnaire

Surprisingly, between 18 September and 12 October 2022 all 16 inquired protected area administrations responded to the above questionnaire.

According to responses by administrations of 16 protected areas (jointly encompassing as much as 370,682.3 ha, thus almost 86.66 per cent of the total territory of all 22 large-scale protected areas designated in the mountainous part of the Carpathian region of Ukraine, indicated in Table 1 in part 2.6 of this document), the total number of their employees accounted for 1,928 people (thus around one fifth of almost 10 thousand NRF staff employed in 8,796 protected natural areas and objects of Ukraine).

The number of staff considerably differed among these 16 protected areas, partly depending on their protective regime and partly on the size of territory under protection. For example, strictly protected Gorgany Nature Reserve of IUCN management category Ia (which excludes active protection measures) is the smallest (5,344.2 ha) among these 16 inquired and has only 49 employees, while the largest protected area in the Ukrainian Carpathians, Carpathian Biosphere Reserve (66,417.4 ha) of IUCN cat. II has the biggest staff, comprising 288 employees. Similarly, the largest of the twelve national nature parks (IUCN cat. II), Carpathian NNP (50,4950 ha) has the biggest staff of 280 people, while the smallest Zacharovanyi kray NNP (6,101 ha) employs only 48. Contrary to NNPs, regional landscape parks (further as RLPs) of IUCN cat. V have quite limited scope of responsibilities and consequently much smaller staff (4 in Nadsianskyi RLP and 4 in Verkhniodnistrovski Beskydy RLP), regardless of the size of their territories (19,428 ha and 8,536 ha, respectively).

The number of employees of the ecosystem protection department (which usually includes also field staff and rangers) also considerably varies, between 148 in the largest (Carpathian Biosphere Reserve) and 18 in the smallest (Zacharovanyi kray NNP), while the two above RLPs do not have such departments. In some protected areas (e.g. in Gorgany Nature Reserve, Carpathian Biosphere Reserve, Carpathian NNP, Cheremos'kyi NNP, Skolivski Beskydy NNP, Synevyr NNP, Verhovynskyi NNP) this department employs half of the total personnel, while in e.g. Uzhanskyi NNP the ecosystem protection department employs as much as 76.5 percent of the total number of staff (75 out of 98 total).

Staff mobilization and losses

Only 2 (Gorgany Nature Reserve and Verkhniodnistrovski Beskydy RLP) of all 16 inquired protected area administrations responded that none of their staff was mobilized (which could particularly affect the latter, employing only 4 people).

As many as 29 employees of Carpathian NNP (out of 280 total, thus over 10 per cent), 26 of Carpathian BR (out of 288 total, 9 per cent), 10 of Boykivshchyna NNP (7.5 per cent), further 10 of Skolivski Beskydy NNP (6.2 per cent), and 7 of Uzhanskyi NNP (7.1 per cent) were mobilized. Mobilized personnel of other parks included 7 from Synevyr NNP, 6 from Verhovynskyi NNP, 2 from Cheremos'kyi NNP, 2 from Syniohora NNP, and another 2 from Vyzhnytskyi NNP. Hutsulshchyna NNP, Korolivski Beskydy NNP, Nadsianskyi RLP and Zacharovanyi kray NNP contributed with 1 employee each. In total as many as 105 employees of these 14 protected area were mobilized, which accounted for 5.6 per cent of their total staff.

Among 26 mobilized employees of Carpathian BR the majority worked either in scientific or ecosystem protection departments. As not all administrations provided exact responses (e.g. one NNP informed that mobilized employees represented all departments, while some other NNPs provided only the total numbers) it can only be stated that approximately half of the mobilized protected area personnel were (and formally still are) employed in ecosystem protection departments, of key importance for law enforcement and implementing the management and nature protective measures on the ground.

As at October 2022, two of them were already killed on the frontline: an employee of Butivla Forestry of Skolivski Beskydy NNP was killed in the battle for Popasna (Luhansk Region) in March 2022, while the 1st class inspector of Uzhotske Forestry from Uzhanskyi NNP was killed in the battles for Donbas in April 2022.

Decreasing funding and budget cuts

As already mentioned, the 2 inquired RLPs (Nadsianskyi and Verkhniodnistrovski Beskydy) are financed from the Lviv regional budget (Lviv regional fund for environmental protection). Other inquired protected areas were partly financed by the state budget, and partly from their own revenues (the majority of which can be retained and constitutes the so called “special fund” at disposal of a particular protected area administration).

However, in general the state budget of Ukraine finances only the so called “protected operational costs” (such as e.g. staff salaries and related costs, due taxes and fees, electricity and gas supplies, communal services), sometimes also minor capital expenditures or equipment costs. But, this stable state budget funding is often insufficient, in particular in some cost categories (budget items), e.g. for electricity and fuels required for heating the office buildings (natural gas and firewood), not even mentioning the low staff salaries.

All other operational costs (e.g. purchase of fuel, other materials and services, capital expenditures, staff business travel expenses) have to be covered from the above “special fund”, collecting revenues for services provided in most protected areas. Other remaining costs, e.g. of carrying out scientific inventories or implementing prescribed protective measures on the ground are (or rather were, before 24 February 2024) partly financed by regional fund for environmental protection, or under international assistance projects (such as, in particular, the German-funded project “Support to Nature Protected Areas in Ukraine” implemented in 2016–2022).

As already mentioned, funding for nature conservation available from the central state budget recently decreased, which has been confirmed by the outcomes of this survey. Despite that a half of the inquired protected area administrations informed that the state budget funding amount planned for 2022 has not officially been reduced, some of the due payments (for “protected operational costs” budget items) were, as in autumn 2022, still pending (probably only temporarily suspended). But, the other protected areas faced the rapid decrease in state budget funding (e.g. by 35 per cent), in some cases even the budget for “protected” staff salaries has been reduced.

None of the 16 inquired protected areas receive funds from their territorially relevant regional environmental protection funds for projects that were approved for funding in 2022. However, the core operational expenses of both inquired RLPs in Lviv region were fully covered by the regional environmental protection fund.

As for the own revenues, it has to be noted that the number of visitors to the majority of inquired protected areas decreased throughout the last year (even compared to the pandemic year 2021), mostly due to the state of war, as in addition to the overall situation in Ukraine (preventing the visitation by both domestic and, in particular, foreign tourists) in some protected areas located at the state borders all tourist trails were (and still remain) closed, moreover a temporary ban on entering forests in border mountain massifs was also imposed.

One of the recently designated NNPs could not assess the trend in tourist traffic (in 2021 compared to 2020), as its administration became operational in 2021. Further, the 2 inquired RLPs could not provide data, as they do not count the visitors entering their territories (which would not be feasible, taking into account that both administrations employ only the tiny staff of 4 people each).

Only 4 out of remaining 13 protected area administrations: Gorgany Nature Reserve, Korolivski Beskydy NNP, Syniohora NNP and Zacharovanyi kray NNP (the last two located in the “safest” Zakarpattia region) reported that the number of visitors remained stable. The other 9 areas experienced a considerable decrease in the tourist traffic. For example, in Vyzhnytskyi NNP (Chernivtsi region) the number of visitors to the Museum of Nature and the Environmental Education Center decreased by 85 per cent, and the number of visitors to the park decreased by 58 per cent. In frequently visited Carpathian BR (also located in Zakarpattia region, and the largest in size of all protected areas in the Ukrainian Carpathians, but partly in border mountain massifs) the tourist traffic decreased by more than half, while in Hutsulshchyna NNP and Synevyr NNP (the latter also located in the safe Zakarpattia) the number of visitors decreased by 50 per cent.

The above had an obvious impact on own revenues from paid services, which in some protected areas considerably decreased (even by 60 per cent in one of the inquired NNPs). Further, it should also be noted that for different reasons (including those related to the state of war), as many as 7 protected areas (Boykivshchyna NNP, Gorgany Nature Reserve, Korolivski Beskydy NNP, Nadsianskyi RLP, Syniohora NNP, Verkhniodnistrovski Beskydy RLP, and Zacharovanyi kray NNP) did not provide paid services throughout the last year, and therefore received no revenues from this source. Only two inquired administrations reported that their own revenues slightly increased (e.g. by 3 per cent).

Due to the above situation, several protected area administrations had to reduce their budgets planned for 2022 in particular for budget items such as capital expenditures, purchase of materials, equipment and external services, or staff business travel expenses (in some cost categories up to 85 per cent decrease).

As the “special funds” of protected areas were significantly reduced, any form of external assistance was (and still is) of fundamental importance, for maintaining the operational capacities of protected area administrations, conducting scientific field research and implementing the prescribed nature conservation measures on the ground.

So far, the Frankfurt Zoological Society supported nine protected areas in the region concerned (Boykivshchyna NNP, Carpathian BR, Carpathian NNP, Cheremos'kyi NNP, Gorgany Nature Reserve, Hutsulshchyna NNP, Skolivski Beskydy NNP, Uzhanskyi NNP, Vyzhnytskyi NNP). Other involved supporting organizations include the Union of Nature Protection and Biodiversity (NABU), Global Conservation (USA), Österreichische Bundesforste AG (Austria), Carpathian Biodiversity Conservation Foundation (Slovakia), Fundația Conservația Carpathia (Romania), WWF Ukraine, the Ukrainian Bird Protection Society, and some Ukrainian NGOs.

Needless to say, the external assistance is still insufficient. Also due to the fact, that some part of vehicles and equipment recently received from the Frankfurt Zoological Society has been transferred for military purposes.

Decrease in operational capacities – transfer of vehicles for military purposes

Additionally, due to the overall situation, considerably affecting also other countries of Europe and the World, prices for several indispensable resources (e.g. energy, and in particular fuels) rapidly increased, further decreasing the operational capacities of protected area administrations, and the mobility of their field services.

It should be noted here, that some of the inquired administrations have no company cars at disposal, due to which their employees either use their own private cars and purchase fuel at their own expense, or simply patrol the vast mountainous areas on foot. Unfortunately, as at late 2022, the above situation is still the case in Korolivski Beskydy NNP (8,997 ha), Nadsianskyi RLP (19.428 ha) and Verkhniodnistrovski Beskydy RLP (8,536 ha).

In other 13 protected areas the number of vehicles is simply not sufficient, compared to the number of their field staff and size of the protected territory. For example, Carpathian BR (66,417.4 ha, the largest in size) has the staff totaling for 288 people (including 148 in the ecosystem protection department, mostly field staff and rangers) but, as at 24 February 2022, it had only 17 passenger cars and 15 motorcycles. Hence, most probably in all protected areas in the Ukrainian Carpathians some employees use private cars, and buy fuel at their own expense.

Moreover, in some other protected areas, part of the fleet of company cars, trucks and other vehicles is quite old (produced in 1990s or even older, e.g. GAZ and Lada Niva 4WD cars) and already worn out, but still kept operational, in the complete absence of other good solutions.

For example, Synevyr NNP (“the richest in vehicles” in the whole Ukrainian Carpathians) until 24 February 2022 officially had 47 vehicles (26 passenger cars, 6 trucks, 5 tractors, and 10 motorcycles). But, as many as 16 vehicles (11 cars, 3 trucks and 2 tractors) urgently required major repairs, or, should their repair no longer be possible, these vehicles should be written-off the register and disposed. Similarly, Uzhanskyi NNP had 9 passenger cars and 2 minibuses, but 3 cars and all 2 minibuses were ripe for write-off and disposal.

However, on the other hand, several of these 13 protected areas recently received modern 4WD vehicles, under the aforementioned project “Support to Nature Protected Areas in Ukraine”. In result, until 24 February 2022, these 13 administrations had (regardless their technical state) the total of 257 vehicles, including no less³⁴ than 33 motorcycles, 8 quad bikes (or all-terrain vehicles, ATVs), 96 passenger cars, 3 minibuses, 26 trucks, 3 firefighting vehicles, 1 garbage truck, 18 tractors, 4 excavators, and 3 trailers.

Despite the above described shortages, 12 administrations (of 13 that had vehicles) handed over some of their vehicles for military purposes (transferred to the Armed Forces of Ukraine and/or its territorial defense units):

- Gorgany Nature Reserve transferred 2 four-wheel drive Toyota Hilux cars;
- Carpathian BR transferred 4 four-wheel drive vehicles (2 Toyota Hilux cars, Renault Duster and GAZ-66);
- Boykivshchyna NNP transferred 2 vehicles (1 car and 1 truck);
- Carpathian NNP transferred 2 vehicles;
- Hutsulshchyna NNP transferred 3 vehicles;
- Skolivski Beskydy NNP transferred 2 vehicles (1 car and 1 truck);
- Synevyr NNP transferred 5 vehicles (2 cars and 3 trucks);
- Syniohora NNP transferred 4 passenger cars;
- Uzhanskyi NNP transferred 5 new Toyota Hilux four-wheel drive vehicles;
- Verhovynskyi NNP transferred 3 four-wheel drive vehicles (2 Toyota Hilux cars and VAZ-2121 Lada Niva);
- Vyzhnytskyi NNP transferred 5 cars;
- Zacharovanyi kray NNP transferred 1 four-wheel drive vehicle (Renault Duster).

³⁴ two administrations did not provide a detailed breakdown of their 62 vehicles.

In total, 38 vehicles were transferred by protected areas for the needs of the military or territorial defense.

Taking into account the number of vehicles at disposal before 24 February 2022, upon the above transfer of some vehicles to the military, several protected area administrations lost (in the best possible case, only temporarily) the vast majority of their vehicles. For example, the aforementioned Uzhanskyi NNP transferred 5 new Toyota Hilux, thus over 83 per cent of its technically operational fleet (previously 6 passenger cars) and is currently left with just one passenger car.

Decrease in operational capacities – transfer of equipment for military purposes

Two Ukrainian “Carpathian” protected areas transferred also other equipment (in addition to, or instead of vehicles). Verhovynskyi NNP transferred 10 radio station sets (each set included 2 radio stations and 2 charging devices) plus 10 pieces of batteries for radio stations, but also IT office equipment (1 Canon printer, 2 monitors, 2 personal computers), while Korolivski Beskydy NNP handed over a projector and a multimedia device.

Further, Korolivski Beskydy NNP (designated in 2020, thus not yet ever had its own cars) transferred the amount of UAH 106,716, and 0.5 t of fuel for the needs of the military.

Increase in the scale of pressures on the extraction of natural resources (firewood harvesting and provision)

According to responses by the inquired 16 protected area administrations, approximately 425,238 permanent residents live either inside these protected areas, or in adjacent areas. The vast majority of the local population uses solid fuels, in particular firewood which is the main fuel for heating residential houses, and sometimes also for cooking purposes. Depending on the geographical location, site accessibility and resulting availability of technical and transport infrastructure, in some local communities this prevailing firewood consumption is supplemented by burning natural or liquefied gas (the latter only for cooking), coal, occasionally fuel briquettes. Sporadically the more expensive electric energy is used (also mainly for cooking purposes, much less for heating).

The average firewood consumption can be estimated at the level of at least some 6 m³ per family, thus it can roughly be estimated that the needs of the above population, consisting of approximately 100 to 140 thousand families, account for no less than 600 to 840 thousand m³ of firewood per year.

Due to the above, one of the questions concerned e.g. the current pressure from the side of the local population (represented by the local self-government bodies) on increasing the volume of harvested forest resources (firewood) in protected areas. Another question concerned the (theoretically possible in the state of war) increase of the annual limits on the use of natural resources within the boundaries of the NRF territories.

The latter was much less possible, as the authors of this report were aware that the current MEPR policy prohibits, even despite the war, increased logging of forests located inside protected areas. As originally expected, almost all inquired protected areas (except for the 2 RLPs, for which such limits are not established, and 2 NNPs where such limits have not yet been established) confirmed, that these limits remained unchanged.

Simultaneously, as many as 7 out of the remaining 12 protected area administrations (namely, the managers of Boykivshchyna NNP, Hutsulshchyna NNP, Skolivski Beskydy NNP, Synevyr NNP, Uzhanskyi NNP, Verhovynskyi NNP and Zacharovanyi kray NNP) reported, that the local self-government bodies did address expectations concerning the increased provision of firewood for the subsistence needs of the local population.

This should probably be the alerting signal for the field services of the above protected areas, responsible for law enforcement and prevention of illegal logging.

Consequently, another question concerned the possible increase in the scale of unauthorized logging in forests on the protected territory of the NRF, compared to previous years. For obvious reasons, it was in fact a delicate question, and the authors did not expect to receive positive answers (which could then question the effectiveness of law enforcement in particular NRF institutions). As expected, only one NNP reported on the recently increased scale of illegal logging on its territory, while the majority denied.

Surprisingly, Skolivski Beskydy NNP informed, that the scale of illegal logging recently decreased, which could possibly be the result of installing a large number of photo-traps for monitoring the populations of animal species (including the reintroduced European bison), that probably deterred potential infringers.

Another similarly “delicate question” concerned the possible increase in the incidence of poaching on the NRF territory, in comparison to previous years. Again, the vast majority of protected area administrations denied, some additionally explained that the scale of poaching was additionally limited by the curfew and hunting ban imposed during the war. Again, Skolivski Beskydy NNP (as mentioned above, equipped with a considerable number of active photo-traps scattered all over the woods, which could also discourage potential poachers) reported that the incidence of poaching on its territory recently decreased.

Necessity to accommodate Internally Displaced People (IDPs)

Last, but not least, the survey questionnaire included also questions concerning the accommodation of IDPs in protected area building and facilities. Only four administrations informed that they had no suitable facilities at disposal and for this reason could not accommodate IDPs (such facilities are still absent, as at October 2022, in Zacharovanyi kray NNP, in the recently designated Korolivski Beskydy NNP, and in the 2 inquired RLPs).

According to questionnaire responses, despite the general lack of buildings and own tourist facilities, protected areas in the mountainous part of the Carpathian region of Ukraine jointly accommodated as many as 711 IDPs in total, most often in protected area premises, but also at employees’ private houses.

The costs related to the stay of IDPs in protected areas have, so far, partly been financed from their “special funds” (although IDPs were allowed to stay free of charge, protected area administrations covered the related costs of e.g. heating and electricity), considerably supplemented by the external assistance funds, in particular those provided by the Frankfurt Zoological Society (including food products, medicine, and other essential supplies, for more details please refer to the next part of this report), the International Organization for Migration (an agency of the United Nations), as well as different charitable organizations and volunteer funds.

4. Support for protected areas in the Carpathian region of Ukraine

According to the newsletter “A new reality for Ukraine’s protected areas”³⁵ published by the Frankfurt Zoological Society (further as FZS) concerning the period between late February and late April 2022, “*over the past weeks, protected areas have been largely cut off from other funding sources. Some supplies also became scarce or impossible to source within Ukraine*” while “*the Ukrainian Carpathians have become a shelter for people fleeing conflict in the east of the country. An estimated 65,000 internally displaced people have sought refuge in the region. The majority of the 13 protected areas in the Carpathians have converted visitor centers, tourist cabins, and offices to accommodate those in need – more than 1,000 lodging possibilities were made available at their infrastructure and staff houses*”.

In response to the above challenge in spring 2022 FZS coordinated a joint initiative involving also several partner organizations: Nationale Naturlandschaften e. V. (Germany), Foundation Conservation Carpathia (Romania) and Aevis (Slovakia), aimed at covering operational costs of hosting internally displaced people (further as IDPs) in facilities made available by protected area administrations, including fuel, heating, conversions of facilities to shelter IDPs, the provision of food, medicine, and other essential supplies needed (e.g. sleeping bags, beds and mattresses, power generators and heaters, kitchenware).

It should be noted that FZS supports not only several selected protected areas in the Carpathian region of Ukraine, but also 8 protected areas in Polesie region (in the north of the country, at the state borders with Poland and Belarus, partly affected by hostilities in the first phase of the Russian aggression) and 7 protected areas located in southern and easternmost parts of Ukraine, directly damaged by the war. FZS provided 70 fire extinguisher backpacks to 3 protected areas in Polesie region and another 50 pieces to protected areas bordering occupied territories in the east of the country.

But, it should also be noted that the above assistance was provided in March and April 2022, hence around half a year ago, when the number of IDPs seeking refuge in the Carpathian region of Ukraine was roughly estimated at 65 thousand people.

Nowadays, according to the official data quoted in part 2.4 of this report, in September/October 2022 the number of officially registered IDPs (probably well below their actual number) in the four “Carpathian” administrative regions of Ukraine totalled for over 794 thousand people (hence, increased over twelve times). In the meantime the situation of protected area employees and their working conditions probably worsened since spring 2022, while “*The winter is coming*”...

Due to the above, the authors of this report several times tried to contact FZS and its staff working in Ukraine, inquiring on the current situation in protected areas in the Carpathian region of Ukraine and possible planned next FZS activities. Unfortunately, most probably due to enormous workload, the Frankfurt Zoological Society has never responded, and did not provide any additional data for the purposes of this report.

However, based on responses of the 16 inquired protected area administrations to survey question No 21, their most urgent needs can be (more or less precisely) assessed below.

All 16 inquired protected area administrations are in urgent need for vehicles of different types (110 in total), in order to replace either those handed over to the Armed Forces of Ukraine and/or its territorial defense units (even if some are returned, their technical state could be questionable) or those worn-out and no longer feasible for major repairs. Additionally, one of NNPs would also like to supplement its company fleet with 50 bicycles.

³⁵ <https://wownature.in.ua/en/ukrainian-parks-received-35-tonnes-of-goods-and-equipment/>

Accordingly to the protected area managers' responses to the questionnaire, the detailed needs for **vehicles** in particular NRF territories / institutions are as follows:

- Gorgany Nature Reserve: 2 four-wheel drive passenger vehicles;
- Carpathian BR: 5 four-wheel drive passenger vehicles, 3 cargo (up to 2 t load capacity) four-wheel drive vehicles, 1 cargo (over 5 t load capacity) four-wheel drive vehicle, 1 four-wheel drive timber truck with a manipulator, 1 four-wheel drive backhoe loader, and 1 tractor;
- Boykivshchyna NNP: 4 four-wheel drive passenger vehicles, 1 DTZ S404 K tractor, and 4 motorcycles;
- Carpathian NNP: 5 four-wheel drive passenger vehicles and 2 trucks;
- Cheremos'kyi NNP: 4 four-wheel drive passenger vehicles and 2 trucks;
- Hutsulshchyna NNP: 5 four-wheel drive passenger vehicles and 2 four-wheel drive dumper trucks (up to 2 t load capacity each);
- Korolivski Beskydy NNP: 3 four-wheel drive passenger vehicles and 1 tractor;
- Nadsianskyi RLP: 1 four-wheel drive passenger vehicle;
- Skolivski Beskydy NNP: 7 four-wheel drive passenger vehicles, 1 truck, 1 firefighting vehicle, and 6 motorcycles;
- Synevyr NNP: 5 four-wheel drive passenger vehicles, 1 minibus, 10 motorcycles, 5 ATVs, and 50 bicycles;
- Syniohora NNP: 3 four-wheel drive passenger vehicles and 1 truck;
- Uzhanskyi NNP: 5 four-wheel drive passenger vehicles, 1 minibus, 1 tractor, and 1 firefighting vehicle;
- Verhovynskyi NNP: 4 four-wheel drive passenger vehicles, and 1 four-wheel drive dumper truck (for the repair of forestry fire roads);
- Verkhniodnistrovski Beskydy RLP: 1 four-wheel drive passenger vehicle;
- Vyzhnytskyi NNP: 5 four-wheel drive passenger vehicles;
- Zacharovanyi kray NNP: 2 four-wheel drive passenger vehicles and 1 truck.

Only 5 (Carpathian NNP, Hutsulshchyna NNP, Synevyr NNP, Verhovynskyi NNP, and Vyzhnytskyi NNP) of 16 inquired protected area administrations responded that they have no needs concerning additional **computer or other electronic equipment**. The needs of the other 11 protected areas are as follows:

- Gorgany Nature Reserve: 10 smartphones for SMART observation programs;
- Carpathian BR: 50 uninterruptible power supply units and 5 scanners;
- Boykivshchyna NNP: 5 PCs and 2 laptops;
- Cheremos'kyi NNP: 1 scanner (A3 format) for herbarium digitization, 1 printer (A3 format) Epson L1300 (C11CD81402) (or BFP) with CISS (or equivalent);
- Korolivski Beskydy NNP: 20 PCs, 2 copiers, 1 risograph, 1 thermal imager, 2 video cameras, 2 cameras and 1 acoustic system;
- Nadsianskyi RLP: 1 colour printer;
- Skolivski Beskydy NNP: 7 PCs and 2 interactive boards;
- Syniohora NNP: 5 PCs with web cameras, 3 multifunctional printers, 3 routers;
- Uzhanskyi NNP: 5 PCs, 5 laptops, 5 printers (including 1 for colour printing);
- Verkhniodnistrovski Beskydy RLP: 2 laptops, 1 tablet or GPS navigator, 1 printer, 1 camera, 2 binoculars, and 1 interactive complex multimedia device;
- Zacharovanyi kray NNP: 2 PCs and 2 laptops.

Only 1 (Carpathian NNP) of 16 inquired protected area administrations responded that it does not need additional **laboratory and professional field equipment**. The needs of the other 15 protected areas are really extensive (hence, for obvious reasons not listed below), and include e.g. weather stations, pH meters, photo traps with GSM communication, GPS navigators, laser rangefinders, altimeters, electronic measuring plugs, drills to determine the age of trees, microscopes, cameras and digital cameras, binoculars, smartphones, batcoders, electric dryers, devices for conducting express analyzes of soil and water, and analytical laboratory equipment as well as laboratory furniture. A special case in the above respect is the recently established (2020) Korolivski Beskydy National Nature Park in Lviv region, so far neither fully staffed (e.g. having, as at October 2022, two vacancies in its ecosystem protection department) nor adequately equipped.

Only 2 (Hutsulshchyna NNP and Synevyr NNP) of 16 inquired protected area administrations responded that they need no additional **uniforms for park employees**. The needs of the other 14 protected areas are as follows:

- Gorgany Nature Reserve: 49 sets of summer and winter uniforms;
- Carpathian BR: 50 sets of summer and winter uniforms;
- Boykivshchyna NNP: 67 sets of summer and winter uniforms;
- Carpathian NNP: 38 sets of summer uniforms;
- Cheremos'kyi NNP: 50 sets of summer and winter uniforms;
- Korolivski Beskydy NNP: 36 sets of summer and winter uniforms
- Nadsianskyi RLP: 3 sets of summer and winter uniforms;
- Skolivski Beskydy NNP: 83 sets of summer and winter uniforms;
- Syniohora NNP: 30 sets of summer and winter uniforms;
- Uzhanskyi NNP: 70 sets of summer and winter uniforms;
- Verhovynskyi NNP: 65 pairs of shoes;
- Verkhniodnistrovski Beskydy RLP: 3 sets of summer and winter uniforms;
- Vyzhnytskyi NNP: 15 sets of summer and winter uniforms;
- Zacharovanyi kray NNP: 48 sets of summer and winter uniforms.

As many as 6 (Gorgany Nature Reserve, Nadsianskyi RLP, Synevyr NNP, Verhovynskyi NNP, Verkhniodnistrovski Beskydy RLP, and Zacharovanyi kray NNP) of 16 inquired protected area administrations responded that they have no **other** needs that those previously listed. The needs of the remaining 10 protected areas are as follows:

- Carpathian BR: 50 pairs of outdoor footwear, 150 pairs of snowshoes, 15 backpacks (50-70 l), 15 winter-autumn season sleeping bags, 15 sleeping pads, 5 tents (for 3 persons each), 15 PonchoBags;
- Boykivshchyna NNP: 20 pairs of snowshoes; educational trips to other European parks;
- Carpathian NNP: 33 SMART software-secured smartphones for security service employees'
- Cheremos'kyi NNP: 1 quadcopter and furniture for furnishing the administrative building;
- Hutsulshchyna NNP: different articles necessary for accommodating IDPs (3 solid fuel boilers, 3 sets of kitchen furniture, 3 washing machines, 3 microwave ovens, 2 shower cabins);
- Korolivski Beskydy NNP: communication means (1 mobile radio station, 36 portable walkie-talkies, 4 stationary walkie-talkies, 11 mobile phones, 1 video surveillance system, and 15 photo traps);
- Skolivski Beskydy NNP: 7 smartphones for electronic accounting of timber, 3 chainsaws, plus educational trips to other European parks;
- Syniohora NNP: training of 30 employees in modern methods of ecosystem protection and scientific research; participation in scientific conferences and internship of 3 scientific workers abroad;
- Uzhanskyi NNP: 15 pairs of snowshoes, 20 mountain bikes;
- Vyzhnytskyi NNP: different articles necessary for accommodating IDPs (heating systems, solid fuel or electric water boilers.

5. Conclusions

In the last years Ukraine really achieved a lot in the field of nature conservation, just to mention the integration of EU environmental acquis into its national legislation since 2017, amendments to some Laws entered in 2017 in order to accommodate the common achievements under the Framework Convention on the Protection and Sustainable Development of the Carpathians, the successful development and adoption of regional red lists of regionally-protected species and the recent revision and updating of the National Red Data Book (the latter achieved in 2021), considerable recent extensions of its Nature Reserve Fund, including the designation of many new protected areas (several of which in the Carpathians), the successful identification of old-growth and primeval forests of the Carpathians and resulting designation of 85 “Virgin Forest Natural Monuments” in this important European mountain range shared with the other 6 “Carpathian” countries, and the successful adoption of 377 Emerald Network sites (in December 2021, while the verification of the next 162 proposed ASCIs is ongoing) that will, sooner or later, become the Natura 2000 sites in Ukraine, upon its accession to the EU.

But, since 24 February 2022, the whole nation of Ukraine and the international community is confronted with the unprecedented act of state terrorism, the largest conventional military attack on a sovereign state in Europe since World War II, and resulting Europe's largest refugee crisis since World War II.

Under the above circumstances, not only the integrity of the territory of independent Ukraine and the survival of the Ukrainian nation is threatened. The natural environment of Ukraine, so far carefully protected in numerous Nature Reserve Fund territories is currently exposed to missile shelling, forest and steppe fires, and other disasters resulting from the hostilities (briefly summarized in part 3.1 of this report).

Furthermore, people who care for the biological and landscape diversity of Ukraine, our common European natural heritage, were either mobilized and serve in the ranks of the Armed Forces of Ukraine or territorial defense, or continue their services in their home protected areas.

But, for obvious reasons, their work is even more complicated and demanding than in the past. Apart from staff mobilization and personnel losses, protected area managers have to face and cope with the lack of basic supplies and materials, decreasing funding resulting in painful budget cuts, as well as the rapid decrease in operational capacities, partly due to the transfer of vehicles and other equipment for military purposes. In addition to the above severe problems, regardless the decreased capacities, protected area managers have to face and cope with the expected increase in the scale of pressures on the extraction of natural resources (in particular firewood, coming from the Carpathian forests) and the wave of internally displaced people (IDPs) seeking a refuge in the premises of protected areas. All the above challenges were briefly described in part 3.2 of this report.

Particularly severe current limitations of protected area field services’ operational capacities resulted from handing over numerous modern vehicles, recently donated by the German Ministry of Economic Cooperation and Development (BMZ) under the project “Support to Nature Protected Areas in Ukraine” (implemented with the major involvement of the Frankfurt Zoological Society between May 2016 and April 2022) to the military and territorial defence units. But, in general the Carpathian protected areas also lack summer and winter uniforms as well as modern communication, office, scientific laboratory and outdoor field equipment.

Taking into account the current situation of Ukraine, the urgent external support seems to be indispensable.

The Ministerial Decision endorsed at the **High-Level Policy Dialogue** "Supporting the recovery and sustainable management of Ukrainian forests and its forest sector" (30 August 2022, Bonn, Germany) adopted by the 44 Member States of FOREST EUROPE (except for the Republic of Belarus, that was not involved in this Ministerial Decision) expressed their willingness to support Ukraine in building back better its forest sector along with necessary reforms after the war-related breakdown in order to conserve, restore and sustainably manage its forests.

The Minister of Environmental Protection and Natural Resources of Ukraine Ruslan Strilets in his speech at the **Ninth Environment for Europe Ministerial Conference** (5-7 October 2022) said: *"Ukraine is ready not only to fight for its future. We are initiating the establishment of a Global Platform for the development of international methodologies for assessing environmental damage caused by military operations. Ukraine's Ministry of Environmental Protection already has significant achievements in this area and is ready to share them with the world. This is important because the war will impact thousands of kilometers around the Ukrainian border. In Ukraine, environmental damage already amounts to at least EUR 36 billion."*

In an interview with Euronews Mr. Ruslan Strilets highlighted how Poland, Lithuania and the Czech Republic were helping Kyiv implement new legislation to better protect the environment, which he claimed would help Ukraine join the European Union.

On 6th October 2022, during the discussion "Application of circular economy principles to sustainable tourism" as part of the Ninth Environment for Europe Ministerial Conference, Minister Ruslan Strilets told the participants of the event about the destruction of our protected fund by the Russians during hostilities, as well as about the plans of the Ministry of Environment for future development.

Minister Ruslan Strilets emphasized, that many picturesque corners of Ukraine, red book species of flora and fauna considerably suffered from hostilities. Twenty percent of Ukrainian protected areas was affected by war, 8 nature reserves and 10 national parks were still (as at 6 October 2022) occupied by the Russian troops. Almost 10 million hectares of the Emerald Network in Ukraine was under threat of destruction. The enemy was burning and using the natural resources of Ukraine as a military base.

Minister Strilets also declared that *"The Ministry of Environment not only did not abandon its pre-war plans in the field of nature protection. Now they are even more ambitious. We are creating the State Agency for Conservation Affairs - a separate body to manage our nature reserve fund. Its business card will be the Emerald Way of Ukraine - a network of our nature reserves, sanctuaries, natural monuments united by a single infrastructure"*.

In the **Ministerial Declaration**, adopted as an outcome of the Ninth Environment for Europe Ministerial Conference, European countries officially condemned Russian crimes against the Ukrainian environment and Belarus' involvement in this act of aggression against Ukraine. They also assured of further support of Ukraine's post-war reconstruction.

Further, European countries invited the ECE secretariat, in cooperation with the United Nations Environment Programme, the Organisation for Economic Co-operation and Development and others, to prioritize assessing the most urgent environmental needs in Ukraine based upon the methodology of the ECE Environmental Performance Review Programme and on the results of ongoing and planned impacts assessments.

It should be noted, that although this report had no ambition to provide an impact assessment of damages to the natural environment and biodiversity of the whole territory of Ukraine, it is the first report on the impact of war, resulting damages to biological and landscape diversity and losses of nature protection services of Ukraine partly based upon the methodology of the ECE Environmental Performance Review Programme.

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Розпорядження голови Закарпатської обласної державної адміністрації від 14.12.2020 № 730 „Про Програму охорони навколишнього природного середовища Закарпатської області на 2021 – 2023 роки” (Order of the Head of the Zakarpattia Regional State Administration dated 14 December 2020 No. 730 “On the Environmental Protection Program of the Transcarpathian Region for 2021-2023”)

Розпорядження голови Закарпатської обласної державної адміністрації від 15.08.2018 № 535 „Про Положення про департамент екології та природних ресурсів Закарпатської обласної державної адміністрації” (Order of the Head of the Zakarpattia Regional State Administration dated 15 August 2018 No. 535 "On Regulations on the Department of Ecology and Natural Resources of the Zakarpattia Regional State Administration")

Наказ Міністерства екології та природних ресурсів України від 18 травня 2018 року № 161 (Зареєстровано в Міністерстві юстиції України 11 червня 2018 р. за № 707/32159) „Методика визначення належності лісових територій до пралісів, квазіпралісів і природних лісів” (Order of the Ministry of Ecology and Natural Resources of Ukraine dated 18 May 2018 No. 161 "Methodology for determining whether forest areas belong to primeval, quasi-primal, and natural forests")

Львівська Обласна Рада, Рішення № 565 від 05 грудня 2017 року „Про затвердження Стратегії розвитку гірських територій Львівської області на 2018 – 2022 роки” (Lviv Regional Council, Decision No. 565 of 5 December 2017 "On approval of the Strategy for the Development of Mountain Territories of the Lviv Region for 2018-2022")

Action Plan for the Implementation of the Association Agreement between Ukraine, of the one part, and the European Union, the European Atomic Energy Community and their Member States, of the other part (approved by the order of the Cabinet of Ministers of Ukraine № 1106, 25.10.2017)

Protected areas in the Carpathian region of Ukraine which responded to the questionnaire

Gorgany Nature Reserve (Ivano-Frankivsk region)

Carpathian Biosphere Reserve (Zakarpattia Region)

Boykivshchyna National Nature Park (Lviv region)

Carpathian National Nature Park (Ivano-Frankivsk region)

Cheremos'kyi National Nature Park (Chernivtsi region)

Hutsulshchyna National Nature Park (Ivano-Frankivsk region)

Korolivski Beskydy National Nature Park (Lviv region)

Nadsianskyi Regional Landscape Park (Lviv region)

Skolivski Beskydy National Nature Park (Lviv region)

Synevyr National Nature Park (Zakarpattia region)

Syniohora National Nature Park (Ivano-Frankivsk region)

Uzhanskyi National Nature Park (Zakarpattia region)

Verhovynskyi National Nature Park (Ivano-Frankivsk region)

Verkhniodnistrovski Beskydy Regional Landscape Park (Lviv region)

Vyzhnytskyi National Nature Park (Chernivtsi region)

Zacharovanyi kray National Nature Park (Zakarpattia region)

Regional and international institutions:

Convention on the Conservation of European Wildlife and Natural Habitats (2021). Updated list of officially adopted Emerald Network sites (December 2021). T-PVS/PA(2021)11. Standing Committee 41st meeting, Strasbourg, 3rd December 2021.

Frankfurt Zoological Society (2022). A new reality for Ukraine's protected areas. (newsletter)

UNECE (2022). Draft Ministerial Declaration of the Ninth Environment for Europe Ministerial Conference, Nicosia, 5–7 October 2022. ECE/NICOSIA.CONF/2022/L.1

Internet Addresses / databases:

BirdLife International
birdlife.org

Carpathian Convention (Convention on the Protection and Sustainable Development of the Carpathians)
carpathianconvention.org

Center for Environmental Initiatives "Ecoaction"
en.ecoaction.org.ua

Central Intelligence Agency
cia.gov

Convention on Biological Diversity
cbd.int

Convention on the Conservation of Migratory Species of Wild Animals
cms.int

Convention on Wetlands of International Importance, especially as Waterfowl Habitat
ramsar.org

Council of Europe
coe.int/en

ECE (or UNECE, United Nations Economic Commission for Europe)
unece.org

Emerald Network Viewer
emerald.eea.europa.eu

Euronews
euronews.com

European Environment Agency
eea.europa.eu

FOREST EUROPE Ministerial Conference on the Protection of Forests in Europe
foresteurope.org

Frankfurt Zoological Society
fzs.org

Газета Верховної Ради "Голос України"
golos.com.ua

Інформаційна агенція "Центр журналістських розслідувань"
investigator.org.ua

Institute of Ecology of the Carpathians, the National Academy of Sciences of Ukraine

nas.gov.ua/EN/Org/Pages/default.aspx?OrgID=0000256

Ministry of Environmental Protection and Natural Resources of Ukraine
mepr.gov.ua/en

Nature Reserve Fund of Ukraine
wownature.in.ua/en

Project “Support to Nature Protected Areas in Ukraine”
snpa.in.ua/en/pro-proekt

Project „Ukrainian Carpathian Mountains“
fzs.org/en/projects/ukraine/carpathian-mountains

Ramsar Sites Information Service
rsis.ramsar.org

Recovery of Ukraine
recovery.gov.ua/en

State Emergency Service of Ukraine
dsns.gov.ua/en

Ukrainian Nature Conservation Group
uncg.org.ua/en

Ukraine War Environmental Consequences Work Group
uwecworkgroup.info/about

UNESCO Man and Biosphere Programme
unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme

UNESCO World Heritage Centre
whc.unesco.org

Verkhovna Rada of Ukraine
rada.gov.ua

WWF Virgin, Quazi-virgin and Natural Forests of Ukraine
gis-wwf.com.ua/