



**Protected Areas Network
of Ukraine:**

CONSEQUENCES

**of Russia's Military Aggression
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Chernivtsi, 2026
Druk Art

*Recommended for publication by the Academic Council of the F. E. Falz-Fein Biosphere Reserve
"Askania-Nova" of the National Academy of Agrarian Sciences of Ukraine
(Minutes No. 5 of 3 September 2026).*

Authors: Oleksii Vasyliuk, Yelyzaveta Temchenko, Viktoriia Gubareva, Viktor Parkhomenko, Oleksandr Khodosovtsev.

Reviewers: Ivan Moisiyenko, Chief Research Scientist at the F. E. Falz-Fein Biosphere Reserve "Askania-Nova", Doctor of Biological Sciences, Professor; Ihor Skilsky, PhD, Chernivtsi Regional Museum of Local Lore.

Protected Areas Network of Ukraine: Consequences of Russia's Military Aggression against Ukraine / compiled by A.Kovbasniuk. – Chernivtsi: Druk Art, 2026. – 72 p. – (Series: "Conservation Biology in Ukraine", No. 47)

ISBN 978-617-8501-66-2

According to official estimates by the State Environmental Inspectorate of Ukraine, more than half of all confirmed environmental damage caused by the war in the territories under Ukrainian control has been inflicted on the Protected Areas Network. This publication provides a detailed analysis of the damage by classifying the cases and range of destruction affecting Ukraine's Protected Areas Network as a result of Russia's war against Ukraine from 2014 through the end of 2025.

The authors also propose an original methodology for screening the overall number of damaged areas within the Protected Areas Network, thereby illustrating the scale of the problem and providing a basis for further analysis and the development of recovery solutions.

UDC: 502.7

The study is produced by NGO "Ukrainian Nature Conservation Group" (project: "Strong Civil Society of Ukraine - a driver towards reforms and democracy") with the support of the Askold and Dir Fund as a part of the the Strong Civil Society of Ukraine – a Driver towards Reforms and Democracy project, implemented by ISAR Ednannia, funded by Norway and Sweden. The contents of this publication are the sole responsibility of NGO "Ukrainian Nature Conservation Group" and can in no way be taken to reflect the views the Government of Norway, the Government of Sweden and ISAR Ednannia.

ISBN 978-617-8501-66-2

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Executive Summary

The war resulting from Russia's aggression against Ukraine, which has continued since 2014, has had an unprecedented impact on Ukraine's Protected Areas Network. Russia's full-scale invasion in February 2022 turned a substantial proportion of the country's most valuable natural areas into zones of active hostilities and exposed them to other direct and indirect impacts of military activities.

Based on the analysis, 1,184 protected areas and sites, accounting for approximately 13% of the Protected Areas Network by number and nearly one-third by area, were identified as affected or located in areas with a high likelihood of significant military impact. More than 665,000 ha of protected areas fell within the modelled area with a high likelihood of significant physical disturbance.

The main direct drivers of impact were military hostilities, fires, landmine contamination, military vehicle movements, and the construction of fortifications. Spatial analysis indicates that at least 559 protected areas and sites were affected by fires likely related to the war, while the total area of identified burned areas exceeded 66,000 hectares. Fortifications directly affected at least 69 protected areas and sites.

Water carries the effects of such events far beyond their point of origin. The destruction of the dam at the Kakhovka HPP in June 2023 simultaneously resulted in the drainage of the reservoir, catastrophic flooding of the delta, changes in groundwater levels, and the transport of pollutants into the Black Sea. At the same time, this catastrophic process has opened a paradoxical "window for recovery": between 2023 and 2025, floodplain forests dominated by native species began to develop on the former reservoir bed. This process could potentially lead to the emergence of the largest contiguous natural area in Ukraine's Steppe Zone in recent decades.

The tanker accident in the Kerch Strait and the pollution of the Seim and Desna rivers demonstrated the vulnerability of marine and transboundary river ecosystems.

The war is causing not only physical destruction of natural ecosystems but also undermining the very system established to protect them. Occupation results in the loss of conservation governance, changes in the boundaries and legal status of protected areas, damage to infrastructure, and the displacement or persecution of staff. These impacts are compounded by militarisation, construction, and excessive recreational use of areas within the Protected Areas Network.

Protected Areas and War: General Trends

Ukraine lies at the crossroads of several biogeographical regions and encompasses the mountain ecosystems of the Carpathians and Crimea, the natural forests of Polissia, the steppes of the east and south, the floodplains of major rivers, sandy landscapes, marine coastlines, and the wetlands of the Black and Azov Seas.

The Protected Areas Network of Ukraine forms the basis of Ukraine's national system for the conservation of protected areas. As of 1 January 2026, it comprises 9,130 protected areas and sites of various categories of national and local significance, ranging from biosphere reserves, nature reserves and national parks to wildlife reserves, natural monuments, and protected tracts.

These categories differ in their protection regimes, scale, and functions, but together they form the core integrated network of Ukraine's Protected Areas Network, intended to safeguard and conserve a wide range of unique landscapes, including the mountain ecosystems of the Carpathians and Crimea, key migration and breeding areas for waterbirds along the coasts of the Azov and Black Seas, the natural forests of Polissia, and the exceptional steppe ecosystems of eastern and southern Ukraine.

The conservation significance of this network extends far beyond Ukraine's borders. Large areas are part of the Emerald Network, established under the Bern Convention to conserve species and habitats. Individual sites are designated as Wetlands of International Importance under the Ramsar Convention, while others form part of UNESCO World Heritage sites and the UNESCO World Network of Biosphere Reserves.



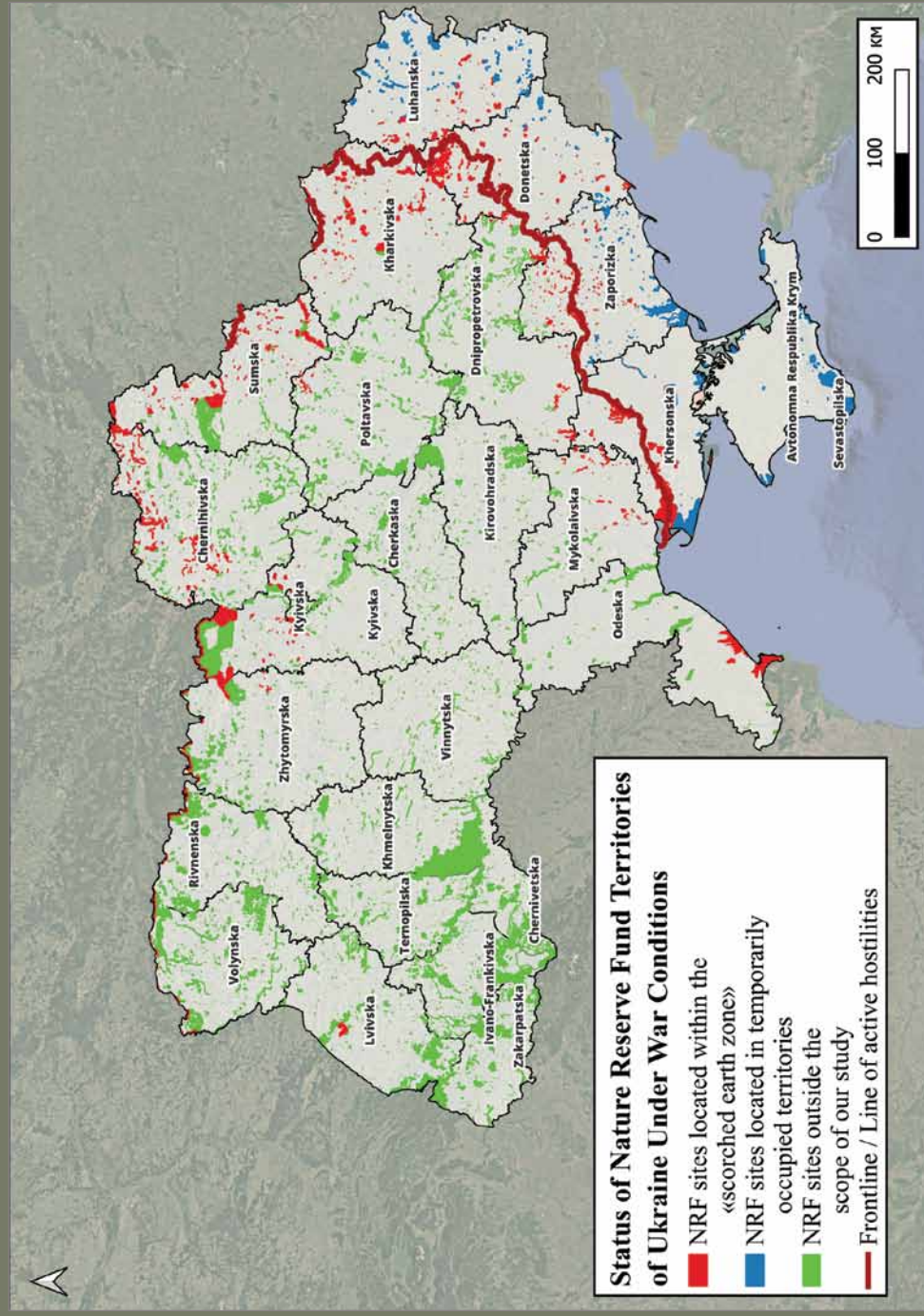


Russian military fortifications in the sandy steppe of Lower Dnipro National Nature Park (Kherson Region), 2021 (before the start of hostilities) and 2024 (after the start of hostilities). Source: Google Earth

Ukraine's natural areas support transboundary ecosystems and migration routes linking the country with other parts of Europe, the Caucasus, Central Asia, and Africa. The loss of stopover sites for birds, spawning grounds, steppe habitats, or extensive wetland complexes can adversely affect populations whose ranges extend far beyond national borders. Consequently, the loss or degradation of Ukraine's protected areas has not only national but also international conservation implications.

The Russian-Ukrainian war began in 2014 with the annexation of the Crimean Peninsula and the launch of Russia's armed aggression in Donetsk and Luhansk regions. These regions were subsequently separated and proclaimed part of Russia. The United Nations General Assembly and the international community did not recognize the legality of the referendum held in Crimea or the incorporation of the Autonomous Republic of Crimea and the city of Sevastopol into the Russian Federation^[43, 98]. The full-scale invasion on 24 February 2022 dramatically expanded the area of active hostilities and occupation and, within a short period, led to the temporary occupation of large areas of Ukrainian territory. According to DeepState^[9], a total of 108,455 km² was occupied, representing approximately 18% of Ukraine's territory. Of this area, 43,974 km² (7.3%) had already been occupied between 2014 and 24 February 2022. By the end of 2025, 7% of this territory had been liberated.

As a result of Russia's aggression, which began in 2014 and continues to this day, a significant number of protected areas have fallen within zones of active hostilities or occupation. Already in the first year of the war, Meotida National Nature Park in Donetsk Region was divided into occupied and Ukrainian-controlled parts, and its special administration had to be relocated. All institutions of the Protected Areas Network located in annexed Crimea also remain under occupation^[47].



Since 2022, when Russia launched its full-scale invasion of Ukraine, approximately one thousand new areas within the Protected Areas Network have been added to the list of occupied territories in eastern Ukraine and on the Crimean Peninsula^[47]. As a result, 44% of the country's most important protected areas – biosphere reserves, nature reserves, national nature parks, and regional landscape parks – have been affected^[1]. Russia was able to inflict significant damage primarily because natural ecosystems around the world are better preserved on the outskirts of administrative areas and at a distance from industrial centres, that is, on the periphery of countries. This pattern also held true in Ukraine. However, because the invasion by Russian forces began along an exceptionally broad front, extending approximately 2,000 kilometres along Ukraine's border, the country's least-disturbed protected areas were among the first to be affected. In recent years of the war, they have remained under constant shelling.

In addition to the areas within the Protected Areas Network directly affected by the war, a number of other sites sustained minor damage from falling debris of intercepted Russian missiles and UAVs, including Kyiv Zoo^[83]. However, because the locations where such debris fell have generally not been systematically recorded, these sites were not included in the list of affected areas.

Assessing Military Impacts on Areas within the Protected Areas Network: Key Considerations

The first studies of the impacts of hostilities on protected areas in Ukraine were conducted during the first phase of the war, between 2014 and 2022. Some of the areas that had been temporarily occupied and damaged in 2014-2015 were subsequently liberated by the Defence Forces of Ukraine. This made it possible to conduct field studies in Holy Mountains National Nature Park and in the Kreidova Flora branch of the Ukrainian Steppe Nature Reserve¹. Staff of Protected Areas Network institutions, non-governmental organisations – most notably the International Charitable Organisation “Environment-People-Law” – and other specialists contributed to these studies^[77].

Because most areas within Ukraine’s Protected Areas Network in the east, and since 2022 also in the south, remain under occupation, the main sources for assessing military impacts are satellite imagery, biodiversity data from these areas, fire data, geospatial data on military events^[34], changes in the frontline^[9, 35], the location of engineering and fortification structures^[12], field research findings, official reports, information provided by the administrations of protected areas, and pre-war records of species and habitats.

To quantitatively assess potential physical damage, these datasets were combined with the boundaries of areas within the Protected Areas Network and used for spatial modelling of zones of likely significant impact, referred to as the “scorched-earth zone”. Five-kilometre buffer zones were modelled around point locations of intense hostilities, and 500-metre buffers around engineering and fortification structures. More than 665,000 hectares of protected areas fell within these zones. Importantly, this estimate represents an area with a high probability of significant physical disturbance rather than the area of ecosystems actually destroyed.

Satellite imagery makes it possible to detect craters, trenches, new roads, fires, flooding, destruction of tree cover, and major changes in land use. However, it cannot directly establish the destruction of a particular population, soil toxicity,

1 A nature reserve corresponds to IUCN Category Ia – Strict Nature Reserve.

the condition of groundwater, or the cause of every fire. Such conclusions require field verification.

Satellite data² were used to assess the scale of fires by locating fire hotspots and identifying areas within the Protected Areas Network that may have been affected. Combining these data into a single spatial layer makes it possible to estimate the total area of potentially affected land. At the same time, satellite monitoring may underestimate the extent of wartime fires, as short-lived fires caused by explosions are not always detected by satellites.

Pre-war data on the occurrence of rare species help identify the natural values that have been placed at risk. However, a record of a species in an area in the past does not constitute evidence that its population was destroyed following shelling. The report therefore distinguishes documented physical changes to an area from assessments of possible biological consequences.

The analysis of satellite imagery is further complicated by rapid successional processes – the spontaneous regeneration of vegetation – in affected areas. Examples include the bed of the former Kakhovka Reservoir and mined and abandoned areas within the zone of active hostilities. The appearance of these areas changes rapidly from year to year, and by 2026 they had undergone substantial changes since the beginning of the war.

It will probably never be possible to quantify all the consequences of the war for areas within the Protected Areas Network. By the time access to these areas is restored, some traces of damage may have disappeared as a result of rapid natural changes, while extensive mine contamination will make access and assessment time-consuming. In addition, pre-war baseline data for many areas are incomplete. Future research is therefore likely to focus less on quantifying the damage caused during hostilities and more on assessing the recovery of ecosystems that have already begun to transform or regenerate.

2 To assess the impacts of fires, Landsat 8 Global Fires I imagery, Terra MODIS Earth observation data, and NASA satellite data were used.

Modelling Possible Recovery Scenarios

Given the challenges of quantitatively assessing impacts, an important area of work could be modelling recovery scenarios following identified damage, assessing ecosystem potential, and planning compensatory measures (such as establishing new protected areas and land conservation).

Examples of Modelling Natural Ecosystem Recovery by Researchers

Over the four years of the full-scale invasion, relatively few researchers have undertaken modelling of nature recovery scenarios in protected landscapes (with the exception of studies of the former Kakhovka Reservoir area, which peaked in 2024-2025).

Botanist Heorhii Bondarenko studied the consequences of the draining of the Oskil Reservoir, located in Kharkiv Region within the Oskil Regional Landscape Park. Following the destruction of the reservoir dam by Russian forces in March 2022, the water level in the reservoir basin dropped sharply, while areas along the Siverskyi Donets River downstream were flooded. Together, these factors triggered local ecosystem changes.

As early as the following year, in summer 2023, the recovery of vegetation cover was recorded in the former reservoir area. Despite certain common features, plant communities differ markedly between individual areas. Alongside typical floodplain plants, adventive species – that is, species introduced from elsewhere – play an important role in shaping these communities^[4].

Another group of researchers studied the potential for restoring pine forests in Holy Mountains National Nature Park, Kreminski Forests National Nature Park, and a number of wildlife reserves in the Siverskyi Donets River valley after these forests were destroyed by fires during the war [20]. They concluded that it would be impossible to restore the forests in the form in which they existed before. The main reason is that the current climate is no longer favourable for the growth of pine stands. Another challenge is that young forests are highly likely to facilitate the spread of fire to unaffected areas.

However, the protected forest in the Siverskyi Donets valley is artificially planted. Therefore, the authors consider the most appropriate approach to be the natural recovery of the original habitats – patches of forest amid sandy steppes^[22] – and the return of the area to its original state.

Impacts on the Protected Areas Network: Nature

According to our analysis, 1,184 areas within Ukraine's Protected Areas Network were classified as affected or located within zones with a high probability of significant military impact. This represents approximately 13% of the entire network by number. The combined area of these territories is close to one-third of the total area of the Protected Areas Network^[76].

As of the end of 2025, 304 areas and sites were located in temporarily occupied territories, while 427 were located in territories that had been liberated. Among those affected were 22 nationally significant institutions: three biosphere reserves, four nature reserves³, and 15 national nature parks. This figure does not include a comprehensive assessment of protected areas in Crimea.

The overall assessment does not cover all local damage caused by missile and UAV debris, as the exact coordinates of such incidents are often not made public. Nor does it reflect indirect pressures in areas away from the front line, including increased recreation, construction, logging, ploughing, and resource extraction resulting from population displacement and the loss of access to traditional recreation areas.

Protected areas are often located along borders, rivers, and coastlines, or within extensive forest and steppe landscapes. During the war, such locations acquired strategic importance, as they were used for routes of advance, defensive lines, and supply routes. Protected status could not physically shield them from hostilities.

According to the official assessment by the State Environmental Inspectorate, by the end of 2025, confirmed environmental damage in the territories under Ukrainian control amounted to UAH 6.01 trillion (approximately USD 141.79 billion)⁴, of which UAH 3.63 trillion (approximately USD 85.64 billion) was attributed to areas within the Protected Areas Network^[40]. These figures demonstrate the scale of the problem, but do not fully capture the loss of species, ecosystem functions, scientific information, or the cultural value of landscapes.

One of the most significant environmental impacts during the period of full-scale hostilities has been the hostilities themselves, including the use of various types of ammunition, which generate intense noise and light disturbance and can cause fires, as well as the movement of heavy military equipment, landmining, the construction of fortifications, and other activities.

³ A nature reserve corresponds to IUCN Category Ia – Strict Nature Reserve.

⁴ Based on the official exchange rate of the National Bank of Ukraine as of 31 December 2025: USD 1 = UAH 42.3878.



The Krasno-Trostianets Forestry Research Station, destroyed by russian forces, in Trostianets Park-Monument of Landscape Art (Sumy Region), April 2022. Photo by Viktor Parkhomenko.

Explosions of Ammunition

One of the most significant environmental consequences of hostilities is the dispersal of heavy metals (lead, copper, zinc, and others) and residues of explosive substances. The detonation and destruction of ammunition trigger chemical reactions whose products are released into the environment and can be transported over considerable distances by air masses, as well as by rivers and ocean currents.

This is because, in areas of intense fighting, soil is fragmented and exposed to extremely high temperatures. The resulting loose, structurally disturbed soil is lifted into the air and, together with gaseous substances, deposited on surrounding areas^[43].

A field study conducted at model sites in Kamianska Sich National Nature Park in Kherson Region found that, five months after shelling, concentrations of lead, sulphur, and phosphorus exceeded the maximum permissible levels. Lead concentrations were 4.8 times higher than background levels, nickel three times higher, cobalt 1.6 times higher, manganese 1.2 times higher, chromium 2.3 times higher, ammonium 1.1 times higher, fluorides 1.7 times higher, petroleum products 39 times higher, iron two times higher, magnesium 1.4 times higher, zirconium 1.3 times higher, molybdenum 1.3 times higher, gallium 2.6 times higher, and arsenic and tin 2.5 times higher^[108]. There is a high probability that heavy metals taken up by plants will eventually enter food chains and accumulate within ecosystems^[108].

Landmining and the Environmental Risks of Demining

Mines, unexploded ordnance, and other explosive remnants of war pose a threat to park staff, local residents, researchers, and wildlife. Landmines restrict economic activities and, in some abandoned areas, may contribute to the spontaneous recovery of natural ecosystems.

Areas contaminated by explosive remnants of war remain inaccessible for management, firefighting, scientific monitoring, and protection against illegal resource use. In historical parks, arboreta, and areas containing living collections, the lack of regular maintenance in itself leads to a loss of their value. For example, almost the entire territory of Trostianets Park-Monument of Landscape Art (Sumy Region) has remained heavily mined since 2022. The lack of access is leading to a gradual loss of its recreational and scientific potential, the degradation of landscape integrity, and the inability to control fires or conduct ecological research.

Published estimates of the total time required to clear Ukraine of landmines range from 30 to 750 years, reflecting the need to clear or have sappers inspect between 26% and 33% of the country's territory^[41]. However, it is important to recognise that the scale of mine-action activities is increasing every day, in particular as Russian forces continue to expand their use of remote mining.



Mined areas near the city of Sumy in 2022. Photo by Viktor Parkhomenko

The situation regarding demining in the de-occupied protected areas varies considerably. In the Hetmanskyi National Nature Park, Desna-Stara Huta National Nature Park, and the Chornobyl Radiation and Ecological Biosphere Reserve, demining operations have not yet begun.

On the territory of Holy Mountains National Nature Park, only manual demining of forest areas, firebreaks, forest roads, access roads to fire ponds, and firebreaks was carried out between 2022 and 2025.

The question of whether and how to prioritise the demining of areas within the Protected Areas Network remains controversial and is not yet regulated by legislation. Protected areas are not considered a priority for demining by the state, despite the interest of the administrations of protected areas.

Nor is there a unified conceptual approach to demining areas within the Protected Areas Network. Mechanical clearance, which is frequently used in humanitarian mine action, often involves substantial soil disturbance, destruction of vegetation cover, and secondary detonations. Within protected areas, such methods can cause environmental damage comparable to, or even greater than, that caused by the landmines themselves. Additional chemical contamination of soils and water, together with the destruction of soil and biotic structures, can significantly hinder the natural recovery of ecosystems.

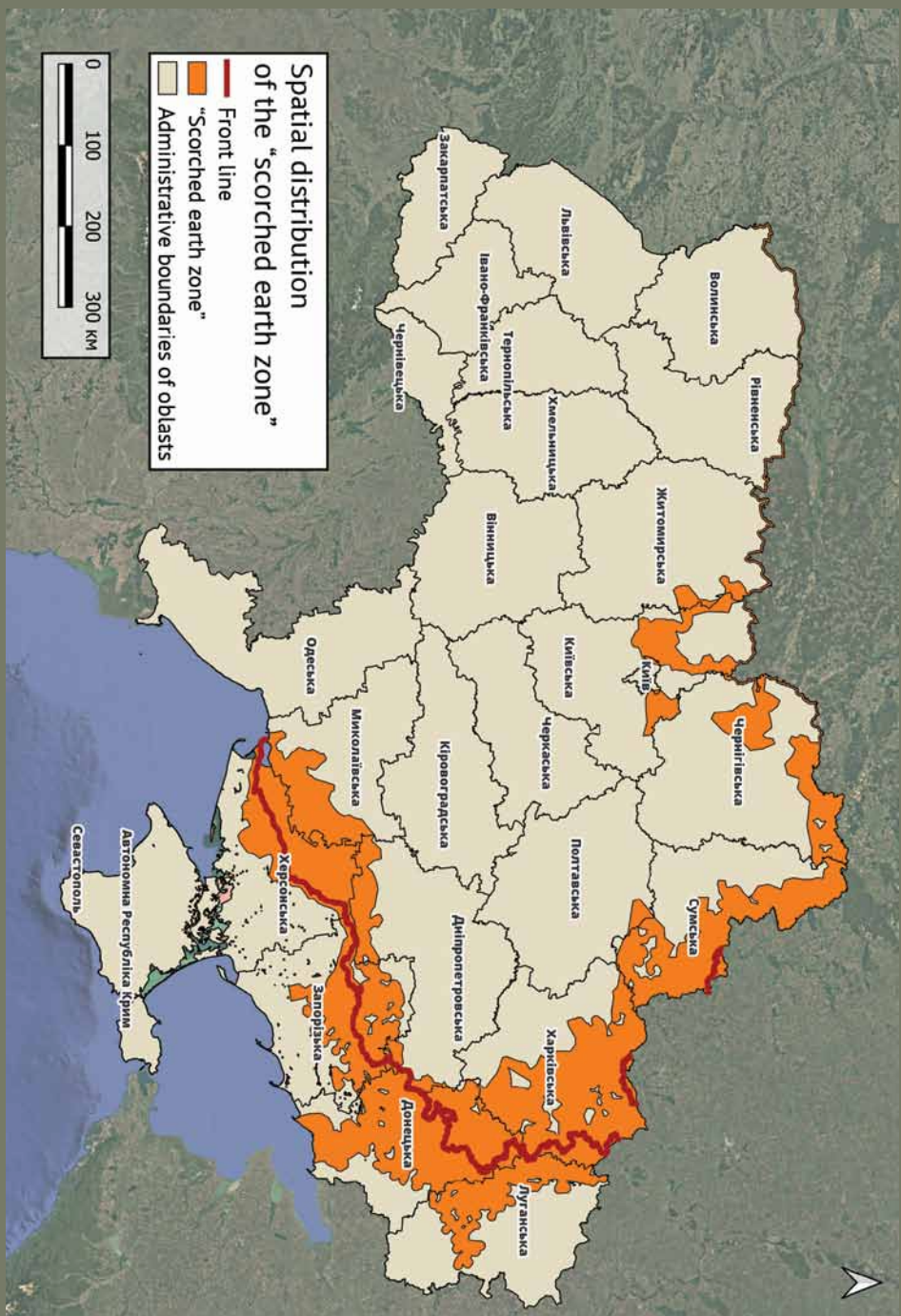
The selection of demining methods and the identification of areas suitable for subsequent use should be considered matters of environmental safety and nature conservation, rather than being assessed solely in terms of speed or technical efficiency. Ensuring compliance with environmentally sound demining approaches is critically important for safeguarding areas within the Protected Areas Network during the post-war recovery process.

Fires in Areas within the Protected Areas Network

Fires are one of the most common consequences of hostilities. They are caused by explosions, ammunition fragments, damage to infrastructure, and other war-related events. Landmining and shelling often make timely firefighting impossible, allowing fires to spread over larger areas.

According to expert estimates, 559 areas within the Protected Areas Network were affected by fires of military origin, accounting for 6.5% of the Protected Areas Network in Ukraine, with a total affected area of 66,364.41105 hectares⁵, as of the end of 2025.

⁵ Data as of 1 January 2026.



Despite the numerous fires recorded in protected areas during the occupation, not all of them were caused by hostilities. At the same time, fires in protected areas within the “scorched-earth zone” can be considered to be of military origin. Economic and recreational activities by the local population are largely or completely absent in these areas, while fires are often caused by explosions of munitions.

The environmental consequences of fires depend on their temperature, duration, season, recurrence, and the type of ecosystem affected. An intense fire can completely destroy tree stands on sandy soils. Steppe and meadow communities are, under certain conditions, better adapted to fire; nevertheless, fires intensify cumulative impacts and interact with other factors causing environmental damage.

Prolonged fires destroy soil organic matter, alter soil structure, and reduce its capacity to retain water and store carbon^[8]. Fire can also significantly alter the chemical composition of soil through the combustion of organic matter and the formation of ash following the burning of vegetation. According to studies conducted in southern Ukraine, concentrations of certain mineral elements, such as calcium, magnesium, sodium, and potassium, generally increase following prolonged fires, while remaining largely unchanged after low-intensity fires^[5, 19, 26, 31].

Construction of Engineering and Fortification Structures

The construction of fortifications directly affected 69 protected areas. Trenches, dugouts, anti-tank ditches, earth embankments, firing positions, new roads, and equipment staging areas became a major cause of ecosystem disturbance during the war (see the section **“Cases of Affected Areas within the Protected Areas Network: Kamianska Sich National Nature Park”** for details).

Russian forces constructed fortifications both along the line of contact and preemptively. Thus, by the end of 2022, they had begun preparing for the possible de-occupation of Crimea by constructing a network of engineering and fortification structures in the areas of the isthmuses connecting it to mainland Ukraine and along the coastlines^[43, 67].

Using satellite imagery, the authors identified approximately 71.5 km of trenches within Emerald Network sites in Crimea. The area of affected habitats amounts to 1.43 km², or 143 hectares. A single trench results in the destruction of vegetation cover extending at least 20 metres on either side.

Strategically advantageous locations for constructing fortifications often coincide with areas of high natural value. For example, on the southern part of the Tarkhan-kut Peninsula, approximately one kilometre of engineering and fortification structures crosses the territory of Charivna Havan National Nature Park, thereby damag-

ing a habitat type that is rare in Europe – “Perennial calcareous grassland and basic steppes” (E.1.2). These steppes are naturally rocky and therefore require considerably more time to recover than areas with chernozem soils^[43].

A single trench results in the destruction of vegetation extending at least 20 metres on either side. Satellite imagery made it possible to identify 71.5 km of trenches running exclusively through Emerald Network sites in Crimea, with an affected habitat area of 1.43 km², or 143 hectares. In most cases, these are coastal areas, coastal steppes, and salt marshes. The coastal belt along the seas is one of the most valuable areas for the conservation of fauna and flora species and natural habitats. It is worth noting that all types of coastal habitats are internationally protected as ecosystems among those most severely affected by infrastructure development and recreation. Because Crimea has long been a popular destination for beach tourism, these ecosystems were already under substantial anthropogenic pressure before the onset of wartime impacts^[43].



Engineering and fortification structures along the coastlines, Tuzly Estuaries National Nature Park. Photo by Olha Bohomaz.

Border fences and minefields also fragment transboundary landscapes. Such barriers pose little threat to flying insects, birds, and small terrestrial animals, provided that appropriately sized openings are incorporated into the fences. However, continuous barriers restrict the movement of moose, deer, roe deer, wolves, lynx, and bears, reducing their access to feeding and breeding areas. Accordingly, the construction of fortifications requires the implementation of mitigation measures and the management of surrounding areas to minimise their impact on the region's biodiversity.

Illegal Use of Natural Resources

Warfare also has indirect impacts on the environment, including in areas far from the immediate zone of hostilities. In particular, even in areas where no active fighting is taking place, natural resources are being intensively exploited to meet wartime needs. Other indirect consequences include unregulated use of natural resources driven by declining living standards among local residents.

Since 2014, unauthorised open-pit coal mining in small informal mines has increased significantly in the temporarily occupied territories of Donetsk and Luhansk regions. In the absence of state oversight, this activity has developed into a profitable illegal business.



*General view of an industrial informal coal mine in a satellite image, Luhansk Region.
Source: Google Earth.*



Illegal coal mining in Perevalskyi Wildlife Reserve (Luhansk Region).

Source: User:Zag, CC BY-SA 4.0.

Coal is extracted from these informal open-pit workings, usually by removing layers of earth with bulldozers to depths of several dozen metres. The waste rock is not deposited in separate spoil heaps, as at legal mines and quarries, but is instead spread around the extraction site. As a result, the area of disturbed land is significantly larger than the area of the individual mining site. The largest such extraction area visible in satellite imagery extends for 15 km.

It is worth noting that rocky steppes cannot be rapidly restored through technical land reclamation.

Satellite imagery shows the emergence of quarries, roads, and large spoil heaps within or near the Illiriyskyi, Bilorichenskyi, and Perevalskyi wildlife reserves. These protected areas are located within the largest remaining areas of rocky steppe in the Donbas region of eastern Ukraine. Approximately 20 species of rare plants listed in the Red Data Book of Ukraine are known from each of these areas, as well as two snake species that occur in Ukraine only here. Water-filled informal mines pose a lethal threat to reptiles, amphibians, and mammals^[36].

Open-pit mining causes greater environmental damage than other extraction methods used in Ukraine. In addition to the direct impacts of extracting fossil fuels, spoil heaps destroy natural areas that are at least ten times larger than the mines themselves^[36].



*Exploratory informal coal mine shafts in Illiriyskiy Wildlife Reserve (Luhansk Region).
Source: Anatolii Dzos, CC BY-SA 4.0.*

Recreational Pressure

Following the annexation of Crimea in 2014, the Russian authorities began using the peninsula's protected areas for recreational purposes. To attract tourists, landscaping and infrastructure works have been carried out that damage local biodiversity. In some areas, the size of nature reserves has been reduced to make way for residential development or hotels (see the section **“Cases of Affected Areas within the Protected Areas Network: Yalta Mountain and Forest Nature Reserve”** for details). In 2022, at the initiative of the occupation authorities' Ministry of Natural Resources in Crimea, excursion routes were also subjected to large-scale anti-tick treatment^[75]. Acaricides have neurotoxic effects and kill not only ticks but also other invertebrates living on the soil surface and in the soil. Some of these are endemic species concentrated primarily in the protected areas of Crimea^[43].

Hydrological and Technological Disasters

The outbreak of the Russian-Ukrainian war brought a new range of environmental threats, resulting in significant pollution of marine and freshwater areas within the Protected Areas Network. These threats have included the deliberate destruction of and damage to industrial and strategic facilities and hydraulic structures, oil-product spills, and other accidents caused by hostilities.

Military Risks to Marine Ecosystems

Military vessels based in marine waters are a source of pollution even in peacetime, while during hostilities the associated environmental risks increase substantially. In particular, scientists have noted^[86] that the Russian cruiser Moskva, which sank in the north-western Black Sea, may have been carrying up to 1,740 tonnes of fuel oil^[103]. After the sinking, Russian forces towed the cruiser to the waters of the Zernov's Phyllophora Field Botanical Reserve of national importance, established to protect the community of the red alga phyllophora^{6 [43]}.

Fuel Oil Spill in the Black Sea

Following the start of the full-scale war, Russia, seeking to circumvent international economic sanctions, began building a shadow fleet and using ageing river tankers to transport petroleum products by sea. As these vessels are not designed for operation in open waters, they are particularly vulnerable to storms and other adverse weather conditions. The use of such tankers has already resulted in several accidents involving oil spills in the Black Sea.

One such incident occurred on 15 December 2024, when two fuel-oil tankers were involved in an accident during a storm in the Kerch Strait. According to various estimates, between 2,400 and 8,500 tonnes of fuel oil⁷ intended for export to India may have entered the sea^[24].

In cold water, fuel oil forms clumps, partially settles on the seabed, becomes trapped among rocks and algae, and may subsequently be washed ashore again.

Carried by marine currents, by early February 2025 the fuel oil had reached distant shores of the Sea of Azov and the Black Sea, from occupied Berdiansk to the Danube Delta (170 and 600 kilometres from the site of the accident, respectively). According to some accounts, the fuel oil eventually reached all countries bordering the Black Sea^[73].

6 This ecosystem has been compared to the Sargasso Sea. However, while the free-floating algae of the Sargasso Sea occur at the surface, in the "Phyllophora Field" they grow on the seabed, making the Ukrainian reserve particularly unique.

7 Fuel oil is a thick, viscous mixture of numerous substances formed as a residual product of petroleum refining (cracking) and poses a serious threat to both human and animal health.

The waters and coastlines affected by the accident include valuable ecosystems, areas within the Protected Areas Network, and tourist and recreational centres. Waterbirds were among those affected by the fuel oil, and most of them could not be rescued^[23, 93].

The accident occurred opposite Cape Takil, where the eponymous landscape and recreational park, a protected area of local significance, is located. In the Sea of Azov, the pollution primarily affected the Kazantyp Nature Reserve^[70], Pryazovskyi National Nature Park in Zaporizhzhia Region^[23], Opuk Nature Reserve^{8, [1]} and the IMMA⁹ “Coastal Aquatic Complex near Cape Opuk and the Elkhenn-Kaya Islands”. This area was established to protect marine and migratory fish, including sturgeons, and is also designated as a Wetland of International Importance^[30] due to its importance as an ecosystem supporting bird migration.



Areas Affected by Oil-Product Spills along the Black Sea and Sea of Azov Coasts

8 A nature reserve corresponds to IUCN Category Ia – Strict Nature Reserve.

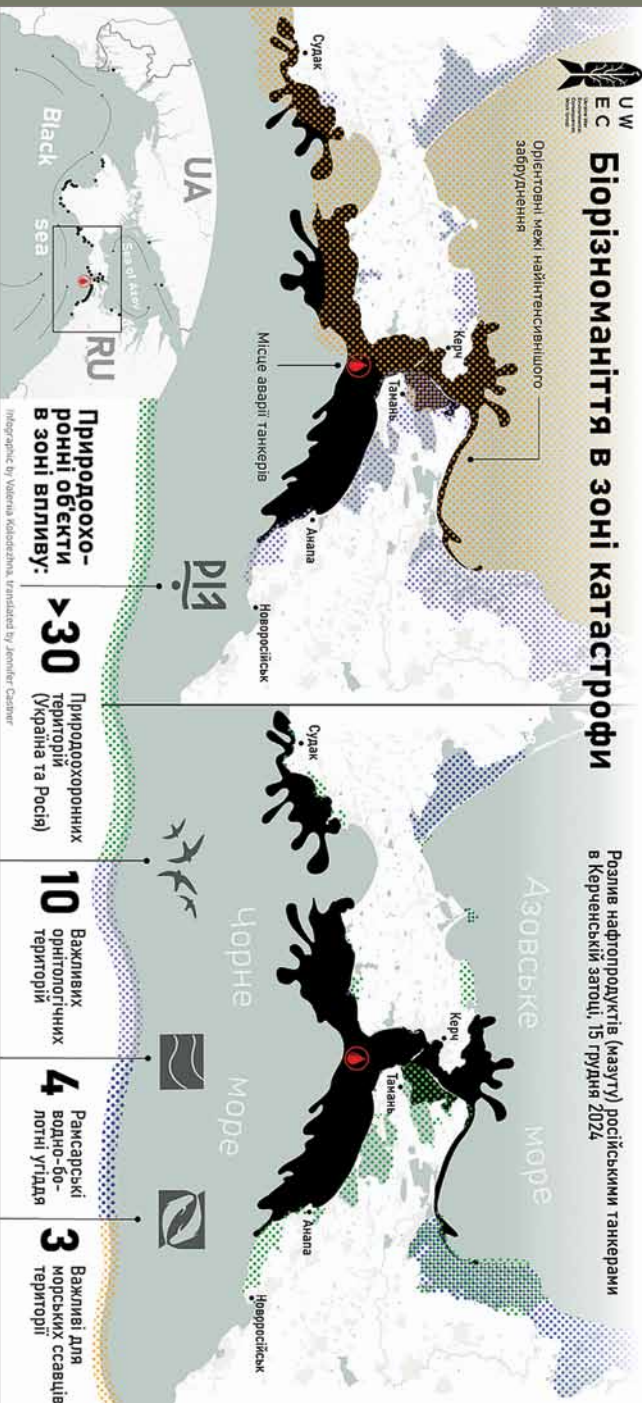
9 IMMA (Important Marine Mammal Area) refers to marine or coastal areas of critical importance to the life and survival of marine mammals.



Біорізноманіття в зоні катастрофи

Розлив нафтопродуктів (мазуту) російськими танкерами в Керченській затоці, 15 грудня 2024

Орієнтовні межі найінтенсивнішого забруднення



Spread of fuel oil in the Black Sea and Sea of Azov and its impact on protected areas^[2].

From Cape Opuk, the pollution spread along the coast, where other important IMMA sites are located, including “Karadag and Opuk”. The fuel-oil slick may have reached as far as Cape Kaliakra in Bulgaria (the IMMA “Kaliakra to Danube Delta”, which serves as a summer habitat for bottlenose dolphins and harbour porpoises)^[23].

Removing fuel-oil clumps from rocky coastlines does not ensure the long-term elimination of the effects of the pollution. An additional factor complicating clean-up efforts is the shallow coastal zone characteristic of Crimea, with an uneven rocky seabed covered by dense growths of large algae. Under such conditions, fuel oil can accumulate and persist in the shelf zone for a long time, creating long-term risks to marine ecosystems and biodiversity^[23].

Destruction of the Kakhovka Hydropower Plant

One of the most extensive examples of the impact of hostilities on the environment, including areas within the Protected Areas Network, was the destruction of the Kakhovka Hydropower Plant dam on 6 June 2023. Russian forces blew up the hydropower plant structure from within, causing more than 14 km³ of water to flow out of the Kakhovka Reservoir over the following 14 days.

The massive release of water resulted in the formation of several zones with distinct impacts: a zone of drainage upstream of the destroyed dam; a zone of temporary flooding, pollution, and desalination of the Black Sea downstream; and a zone of temporarily elevated groundwater levels on the left bank of Khereson Region. All of these impact zones encompass areas within the Protected Areas Network, with some protected areas experiencing destructive impacts across 100% of their area.

The discharge of contaminated bottom sediments that had accumulated in the reservoir over decades caused additional environmental damage. The destruction of the Kakhovka Hydropower Plant dam also occurred during the breeding season of many animal species, potentially resulting in substantial losses of their offspring.

The drainage fundamentally changed conditions in Velykyi Luh National Nature Park, Kamianska Sich National Nature Park, Dnipro Rapids Wildlife Reserve, and other areas. The aquatic ecosystem disappeared across a large area within a matter of days. At the same time, the exposed reservoir bed became a site of rapid regeneration of willows, poplars, and other native floodplain species.

Temporary flooding affected 47 areas within the Protected Areas Network to varying degrees^[106]. The Dnipro Delta within Lower Dnipro National Nature Park experienced the greatest impact. Flooding destroyed terrestrial habitats, nests, and the administrative and research infrastructure of the Black Sea Biosphere Reserve, which has been protected since 1927 and is part of the UNESCO World



The first experimental plots established in Kamianska Sich National Nature Park, on the bed of the former Kakhovka Reservoir, July 2023. Photo by Ivan Moisiienko.

Network of Biosphere Reserves¹⁰, as well as those of three other national nature parks and Kinburn Spit Regional Landscape Park^[43].

As a result of the disaster, protected areas along the Black Sea coast located more than 200 km from the site of the destruction of the Kakhovka Hydropower Plant were affected by pollution and freshwater influx. These included the Zernov's Phyllophora Field and Zmiinyi Island wildlife reserves of national importance, as well as Tuzly Estuaries National Nature Park, where plant debris and waste from flooded areas were carried into the sea along with the freshwater discharge^[43].

Several protected areas were affected by the rise in groundwater levels. These include Oleshkivski Pisky National Nature Park, Sahi landscape wildlife reserve of national importance, Korsunskyi and Shaby forest wildlife reserves, and other areas.

10 The administration of the Black Sea Biosphere Reserve was also located within the flooded area. The flood destroyed administrative buildings and the museum. Thus, in addition to natural heritage, a century of scientific research was permanently lost: research diaries, observation records, the exhibition of the environmental education centre, herbaria, photographic archives, teaching materials, and a library containing 3,480 publications.

The destruction of the Kakhovka Hydropower Plant also affected the water supply system of the Askania-Nova Biosphere Reserve in southern Kherson Region. Before the disaster, its operations depended on irrigation water from the Kakhovka Reservoir. Following the destruction of the hydropower plant, the water supply had to be switched to artesian aquifers. However, because the area is under occupation, it is currently impossible to assess the available groundwater reserves or the prospects for their use^[43, 47].

The future of the area will depend on the decision whether to restore the reservoir or preserve the natural floodplain that has regenerated following the destruction of the dam.

Pollution of the Seim and Desna Rivers

The pollution of the Seim and Desna rivers in 2024 was one of the most extensive cases of the impact of hostilities on aquatic ecosystems and areas within Ukraine's Protected Areas Network. The State Agency of Land Reclamation and Fisheries of Ukraine publicly accused the russian side of poisoning the water^[54]. At the same time, under conditions of active hostilities, it was practically impossible to establish the exact source of the pollution^[55].

There are grounds for linking the mass fish mortality to toxic substances entering the waterways following the suspected damage to an industrial facility in russia near the Ukrainian border. Potential sources of the pollution included sugar and alcohol plants in kursk Region, particularly facilities near tyotkino, as well as a leather factory in the town of rylsk^[55].



*Consequences of the environmental disaster on the Seim River in August 2024.
Photo by Serhii Zhuk^[56].*



Dead fish on the shore of Zoloty Bereh Beach in Chernihiv^[92].

The first signs of deteriorating water quality were recorded on 15 August: the water became dark and turbid, a strong odour appeared, and mass fish mortality was observed. By early September, the pollution had reached the lower reaches of the Desna^[55]. As a result, the affected area extended for approximately 600 km along two of Ukraine's major rivers.

Laboratory analyses of water samples revealed substantial organic pollution and critically low levels of dissolved oxygen. Chemical oxygen demand (COD) exceeded the applicable standards by 2.1 times for water bodies used for domestic purposes and by 1.28 times for fisheries water bodies, while five-day biochemical oxygen demand (BOD₅) was 3.67 times above the standard. At the same time, dissolved oxygen concentrations were 2–3 times below the applicable standards.

In some sections, dissolved oxygen concentrations fell below 1 mg O₂/dm³—a level incompatible with the survival of most fish and many other aquatic organisms. These sections of the river were also characterised by a sharp increase in suspended solids and ammonium nitrogen concentrations^[55].

In addition to mass mortality of fish and molluscs, beavers were also found dead within the affected area. Among the dead fish were sterlet, a rare sturgeon species that is critically endangered in Ukraine^[56].

The pollution passed through Seimskyi Regional Landscape Park, where the river valley was one of the last known areas where the Russian desman (*Desmana moschata*) had been recorded. The species is considered functionally extinct across most of its range in Ukraine, with the Seim River remaining its last confirmed stronghold^[102].

According to official information from the Ministry of Environmental Protection and Natural Resources of Ukraine, the environmental damage caused in Sumy and Chernihiv regions exceeded UAH 405 million (approximately USD 9.84 million)¹¹. However, this assessment does not account for long-term biodiversity losses, ecosystem degradation, or the actual loss of the conservation value of a substantial proportion of the floodplain areas^[103].

11 Based on the official exchange rate of the National Bank of Ukraine as of 11 September 2024: USD 1 = UAH 41.1400.

Impacts on the Protected Areas Network: Policy

All protected areas of Ukraine that have been annexed or occupied have come under Russia's political and administrative control and are being used as an instrument of a policy aimed at consolidating the occupation and legitimising its territorial claims. This is manifested, in particular, in the creation of structures and institutions that duplicate Ukrainian protected areas, as well as in presenting them internationally as Russian institutions.

Crimea: Changes in Boundaries, Categories, and Land Use

Following the occupation of Crimea in 2014, Russia incorporated Ukrainian protected areas into its own administrative system. These included six nature reserves and one national nature park. Transferring some protected areas to bodies associated with forestry or recreation changed management priorities, with scientific activities consequently losing their status as one of the institutions' priority areas of work.

The occupation authorities have repeatedly revised the list of protected areas. Sixteen sites were nominally expanded by a total of 1,333 hectares, 22 Ukrainian protected areas established earlier disappeared from the lists, and the area of 42 sites was reduced by approximately 14,242 hectares^[43]. Together with sites that were removed entirely, the total area lost is estimated at approximately 17,000 hectares.

Among the areas whose boundaries were reduced were the Kazantyp, Karadag, Opuk, and Yalta Mountain and Forest Nature Reserves¹². Although such administrative decisions do not alter their status under Ukrainian law, they have tangible consequences on the ground. This suggests that activities incompatible with the protection regime applicable to Ukraine's Protected Areas Network may already be taking place in these areas or may take place there in the future.

The Kazantyp Nature Reserve¹³ provides a telling example of the combination of boundary changes and commercial use: a tourist facility has begun

12 A nature reserve corresponds to IUCN Category Ia – Strict Nature Reserve.

13 A nature reserve corresponds to IUCN Category Ia – Strict Nature Reserve.



"Glamping" facility built within Kazantyp Nature Reserve^[38].

operating within the reserve and is promoted as a seaside recreation destination^[38, 49]. For a nature reserve, this represents a fundamental change in its protection regime.

Some of the protected areas that have disappeared from the lists maintained by the occupation authorities are located within larger areas of the Protected Areas Network. This may have been one of the reasons for their removal from the lists. At the same time, the revocation of the separate protected status of even a small wildlife reserve means the loss of the corresponding protection regime, potentially increasing the vulnerability of valuable ecosystems and natural features to human activities, including logging and construction.

Most of the areas that have lost their protected status are independent areas within the Protected Areas Network that do not overlap with other protected areas, such as the Small Phyllophora Field Botanical Reserve, covering 38,500 hectares. The reasons for their removal can be assessed indirectly by analysing the changes that have taken place since their protected status was revoked^[43].

For example, the Yevpatoriia Dendrological Park (3.2 ha), Salhyrka Park-Monument of Landscape Art (42 ha), and Morskyi Priboi Sanatorium Park (9 ha) were probably revoked in connection with the development of recreational activities^[80; 104]. In other cases, there appears to be a link to military use: the North-Eastern Shores of Lake Donuzlav Wildlife Reserve (800 ha) and Cape Chauda Natural Monument (5 ha) came to be located within a military base and a military training ground, respectively. A facility reportedly associated with the residence of the president of Russia was constructed within the Southern Coast Oak Groves Botanical Wildlife Reserve (20 ha)^[43; 52].

Downgrading the Status of Areas within the Protected Areas Network

The conservation status of some protected areas and sites in occupied Crimea has been downgraded. Under Ukraine's system of protected areas and sites, areas and sites of national significance fall under the authority of central government bodies, while those of local significance fall under the authority of regional bodies. Under russian occupation, this has resulted in the transfer of a number of areas from the federal to the regional level of governance, which has likely expanded the ability of the occupation administration to manage and dispose of them. This change in status affected Charivna Havan ("Magical Harbor") National Nature Park, Cape Martyan Nature Reserve¹⁴, as well as almost all wildlife reserves and natural monuments of national significance. In addition, Crimean Nature Reserve¹⁵ was reorganised into a national park, which has likely created additional opportunities for economic use of its territory, including construction^[43].

The absence of Ukrainian state control over the occupied territory of Crimea significantly complicates enforcement of the protection regime. During the full-scale war, anthropogenic pressure on natural areas has increased, while their use has increasingly taken place without regard to conservation objectives. As a result, the formal retention of protected status does not guarantee effective protection of ecosystems and, in some cases, may be accompanied by their commercial development^[43].

Establishment of Protected Areas in Occupied Territories

After 2022, russia began formally incorporating occupied Ukrainian protected areas into its own system as russian institutions. Government decisions were used to "re-establish" the Askania-Nova and Black Sea Biosphere Reserves, Holy Mountains National Nature Park, the Luhansk and Ukrainian Steppe Nature Reserves, and the Yunytskyi Wildlife Reserve. The occupation authorities created their own institutions with identical names in their place and appointed russian directors^[39].

It is important to note that these were not newly established protected areas, but an administrative appropriation of the names, land, infrastructure, and history of Ukrainian institutions. The boundaries declared by the russian authorities do not always correspond to the territories actually under russian control. Some of these structures include areas that remained under Ukrainian control, such as

14 A nature reserve corresponds to IUCN Category Ia – Strict Nature Reserve.

15 A nature reserve corresponds to IUCN Category Ia – Strict Nature Reserve.

the Kreidova Flora branch of the Ukrainian Steppe Nature Reserve, most of the territory of Holy Mountains National Nature Park, and the Volyzhyn Forest branch of the Black Sea Biosphere Reserve.

After 2022, Russia also began the highly visible establishment of new protected areas in occupied Crimea^[75]. However, an analysis of their functioning reveals a substantial discrepancy between their formal conservation status and the actual priorities of their management. In the documentation for some of these areas, biodiversity is barely described, while considerable attention is given to recreational use and the possibility of leasing land. For example, the regulations governing the Kalamitskyi Wildlife Reserve make no mention of the rare plant *Calystegia soldanella*, although the species occurs within the reserve and is classified as “endangered”^[15, 90]. Similar omissions can be found in the documentation for the Kamiani Hryby Natural Monument, where sites supporting the endemic *Saxifraga irrigua* have not been taken into account^[17]. In practice, the new wildlife reserves established by the Russian authorities in Crimea are being created in well-known recreational locations specifically to increase the rental value of the land for recreational businesses, rather than for nature conservation purposes.

At the same time, substantial funding is being directed towards the improvement and development of protected areas, with up to EUR 2.5 million allocated to individual parks and gardens of landscape art^[48]. Combined with insufficient attention to biodiversity research and conservation, this indicates a shift in priorities away from nature conservation towards recreational and economic



Map of the Kalamitskyi Wildlife Reserve
(from the regulations governing the reserve).



Calystegia soldanella in the wildlife reserve,
next to a cigarette butt^[16].

development of these areas. Quad bikes, mass tourism, and the allocation of land for recreational purposes place additional anthropogenic pressure on ecosystems.

Meanwhile, Ukraine completely suspended work on expanding the Protected Areas Network in Crimea in 2014. At that time, protected areas covered approximately 8.3% of Crimea^[111], with this figure expected to increase to 23% by 2021. However, these previously announced plans remain unrealised^[43] and can evidently only be resumed after the territory is de-occupied.

Conservation Rhetoric as a Tool for Legitimising the Occupation

In recent years, experts have documented attempts by Russia to use conservation policy and international conservation mechanisms to create an appearance of legitimate governance in the occupied territories.

In 2023, records began appearing in the World Database on Protected Areas in which Ukrainian protected areas in occupied territories were identified as Russian^[28, 29]. Following an appeal by the Ukrainian Nature Conservation Group, UNEP-WCMC removed records for 130 areas in Crimea that had been presented as Russian.

*Buildings destroyed by Russian shelling in the village of Boromlia, Sumy Region, April 2022.
Photo by Viktor Parkhomenko.*



Impacts on the Protected Areas Network: Social and Humanitarian Sphere

During the full-scale invasion, staff of protected-area institutions faced a professional, humanitarian, and security crisis. Some administrations continued to operate even after occupation, seeking to care for animals, prevent fires, preserve documentation, and maintain essential operations.

Protected Areas that are or have been under russian occupation suffered extensive losses of property and infrastructure. Administrative buildings of some protected-area institutions were looted, damaged, or completely destroyed. In particular, administrative buildings of Kamianska Sich, Desna-Stara Huta, and Dvorichanskyi National Nature Parks, as well as the Black Sea Biosphere Reserve, were destroyed.

Scientific collections and archives also suffered major losses. The archives, herbaria, and collections of the Ukrainian Steppe Nature Reserve were destroyed in the winter of 2015. In 2023, the museum and office of the Black Sea Biosphere Reserve were lost as a result of the destruction of the Kakhovka Hydropower Plant dam and subsequent flooding. The collections, research diaries, and other scientific materials accumulated by the institution between 1927 and 2023 were destroyed along with them^[47].



For protected areas in occupied territories where continuing conservation activities remained physically possible, serious financial constraints arose after the beginning of the occupation. These protected areas lost access to funds accumulated in their accounts through recreational activities before the full-scale war, as well as the ability to use their bank accounts fully for day-to-day expenses, procurement, and receiving charitable assistance after the State Treasury Service of Ukraine discontinued servicing their accounts (see the section **“Cases of Affected Areas within the Protected Areas Network: Falz-Fein Biosphere Reserve “Askania Nova”** for details).

Staff faced a lack of communication, shortages of food and medicines, coercion to cooperate, and the threat of violence and death. Some managers and employees were forced to cooperate with the occupation authorities, detained, abducted, or persecuted. In some cases, employees disappeared after being abducted or were killed^[47].

The case of Kamianska Sich National Nature Park is particularly illustrative. In the first days of the occupation, Russian soldiers detained the park's director, accusing him of involvement in a “Nazi formation” – an allegation apparently based on the fact that the park's name contains the word “national”^[50]. He subsequently managed to escape captivity. Park staff were also forced to destroy the uniforms of the state protection service of the Protected Areas Network, fearing persecution because the uniforms resembled military attire^[47].

Humanitarian Assistance

In response to the humanitarian and social problems that emerged in protected areas within the occupied territories, assistance began to be provided by Ukrainian and international non-governmental organisations, charitable foundations, individual citizens, and businesses. During the first 1-1.5 years of the full-scale war, civil society played a key role in supporting staff of protected areas. Horizontal links among the protected-area institutions themselves also became an important resource, facilitating the evacuation of staff, their subsequent employment, and the organisation of humanitarian assistance.

A separate area of support involved internally displaced persons (IDPs). Since the beginning of the full-scale war, areas within the Protected Areas Network have provided temporary shelter to more than 60,000 people^[79]. Vyzhnytskyi and Yavorivskyi National Nature Parks converted administrative premises into accommodation for displaced people and helped collect and distribute humanitarian aid, including assistance for people evacuated from Mariupol. Despite continuous shelling, Holy Mountains National Nature Park in Donetsk Region accommodated nearly 8,000 displaced people from Izium, Sievierodonetsk, and Rubizhne^[47].

Protected Areas Network institutions also supported one another, including by employing evacuated staff at national parks in western Ukraine and Odesa Region.

The evacuation of managers and staff of Protected Areas Network institutions from occupied territories presented a particular challenge. Because of their official positions, they were under particular scrutiny by the occupation forces and, in some cases, faced persecution and threats^[18]. Some staff members were able to evacuate through russian territory.

Through joint efforts, by early 2026, the vast majority of officials and employees of protected areas had been evacuated from territories beyond Ukrainian control^[47].

At the same time, although the Ministry of Environmental Protection and Natural Resources of Ukraine remained the main state channel for communication concerning the condition of protected areas in the occupied territories, no systematic coordination of humanitarian assistance to staff of protected areas between government bodies and volunteer initiatives had been established.

Cases of Affected Areas within the Protected Areas Network

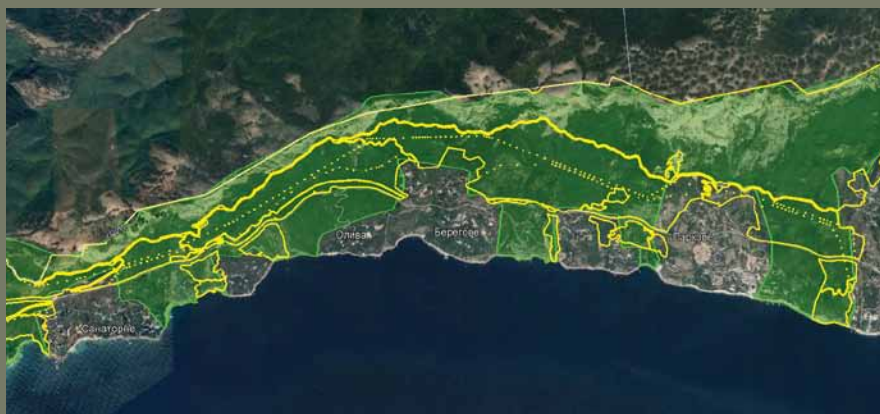
Yalta Mountain and Forest Nature Reserve¹⁶

Autonomous Republic of Crimea

The reserve is under occupation

Yalta Mountain and Forest Nature Reserve is located in the south-western part of Crimea and stretches for approximately 49 km along the Black Sea coast, from Foros to Hurzuf, encompassing mountain and forest landscapes around Yalta. The reserve was established in 1973. It covers a substantial part of the natural landscapes of the Southern Coast of Crimea, which are characterised by high biodiversity^[32].

Before the occupation, the reserve was distinguished by one of the highest levels of floristic diversity among Ukraine's nature reserves: at least 1,364 species of vascular plants, 183 species of mosses, 154 species of lichens, and 1,733 species of fungi had been recorded there^[32]. In 2018, Russia transferred the



Areas removed from the Yalta Mountain and Forest Nature Reserve (green — the current boundaries under Ukrainian law; yellow — the boundaries according to the occupation authorities in Crimea). Source: Google Earth.

¹⁶ A nature reserve corresponds to IUCN Category Ia — Strict Nature Reserve.



Areas on the western outskirts of Yalta that were built up by the occupation authorities between 2014 and 2024 (marked with red lines). Source: Google Maps.



The former and current boundaries of the reserve under Ukrainian law (marked with red and yellow lines, respectively). Source: Google Maps



Built-up area on the northern outskirts of the village of Oliva within the Yalta Mountain and Forest Nature Reserve; satellite imagery from 2013 and 2024. Source: Google Earth.



An area of the reserve converted by the occupation authorities into a parking area for the Mriya Resort & Spa resort complex. Satellite imagery from 2013 and 2024. Source: Google Earth.

Yalta Mountain and Forest Nature Reserve to federal jurisdiction^[89]. In 2020, its area was officially reduced by 64 hectares, from 14,523 to 14,459 hectares. A substantial proportion of the land removed from the reserve was subsequently allocated for construction^[32].

Before the occupation, the reserve status restricted economic and recreational use of the territory under Ukrainian law, including prohibiting organised recreational activities. Following the establishment of Russian control, the protection regime was weakened: open sources have documented offers of tourist services^[111] and route maps^[25] within the protected area, while the areas removed from the reserve are being actively developed.

A telling example is the Lastochkino Gnezdo residential complex near Haspra, construction of which began in 2014-2015^[21]. The complex is located in an area that, according to the boundaries established under Ukrainian law, was part of the reserve.

Falz-Fein Biosphere Reserve

“Askania Nova”

Kherson Region

The reserve is under occupation

Falz-Fein Biosphere Reserve “Askania Nova” is one of Ukraine’s most valuable protected steppe areas. It was established as early as 1888 as Ukraine’s first steppe nature reserve.

From the first days of the full-scale invasion on 24 February 2022, Falz-Fein Biosphere Reserve “Askania Nova” came under Russian occupation. Unlike many other occupied protected areas, the reserve was largely spared direct hostilities, allowing its staff to continue their core activities. During the first months of the occupation, the management and most employees remained on site, and the reserve continued not only to maintain the functioning of the territory but also to conduct scientific research^[47].

The reserve combines virgin steppe, a dendrological park, and a zoo where wild ungulates are kept in semi-free-ranging conditions. The reserve also has international status as a UNESCO biosphere reserve under the Man and the Biosphere (MAB) Programme. At the beginning of 2022, the zoo collection comprised 3,597 animals, including 1,623 ungulates. Given the size of the collection, its evacuation was practically impossible, despite repeated offers of assistance from international partners^[47]. This made ensuring adequate supplies of food and water, electricity, and veterinary care for the animals one of the key challenges of the occupation.

Financial and Administrative Isolation

Following the occupation, budget funding for maintaining the collections effectively ceased. Funding was partially restored in July 2022, but the use of these funds remained severely restricted. Payments through the Treasury system could be made only for salaries and utility services. As a result, in 2022 the reserve received approximately 55% of the funding provided for under its programmes^[47].

Ukrainian and international donors played a critically important role in supporting the reserve. In 2022, non-budgetary contributions received through donors amounted to 167.9% of the annual target. These funds were used to purchase animal feed and fuel, equipment for water and energy supply, carry out fire-prevention measures, and undertake essential repairs^[47].

The situation became more difficult in March 2023, in the thirteenth month of the occupation, when the occupation authorities established direct control

over the institution and appointed their own director, D. Miescheriakov. Following this, the reserve's special administration switched to remote working. Russian military personnel regularly conducted searches and seized the state protection service's service weapons, part of its equipment, and vehicles, effectively depriving the service of its ability to fully perform its territorial protection functions^[47].

At the same time, despite the occupation, as of early 2026, the reserve continued to receive state budget funding, while scientists who had been forced to leave the occupied territory continued to carry out research programmes remotely^[109].

Impact of Hostilities on the Reserve's Natural Environment

Although the reserve's distance from the line of contact and predominantly open steppe landscape limited its use for defensive structures, military convoys passed through the reserve, and military equipment was stationed within the dendrological park. Military aircraft also regularly flew over the territory^[47].

The military presence caused additional stress to animals and resulted in injuries and deaths. In August 2022, for example, a male nilgai (*Boselaphus tragocamelus*) died after breaking its neck against a fence while reacting in panic. Cases of premature pregnancy loss were also recorded among mares of Przewalski's horse (*Equus przewalskii*) and the Turkmen kulan (*Equus hemionus kulan*), which may have been associated with stress.

Fires as the Main Impact Factor

The greatest direct losses to the reserve's natural ecosystems during the full-scale invasion resulted from fires. The area of burned protected steppe increased from 51 ha in 2022 to 2,159 ha in 2023. The increase in the number and scale of fires was directly linked to the occupation of the territory and the presence of military units within the reserve. Under occupation, fire-prevention measures were carried out only partially, facilitating the spread of fire.

The exceptionally valuable Uspenivka area was particularly severely affected. It is a representative fescue-feather-grass steppe of the Black Sea region, with plant communities listed in the Green Book of Ukraine, including Ukrainian feather grass (*Stipa ucrainica*) and feather grass (*Stipa capillata*). To extinguish fires, the occupation administration used a plough, causing mechanical damage to part of the valuable steppe vegetation. Traces of these activities were identified in satellite imagery and confirmed by people involved in firefighting.

The fires also affected the habitats of Velykyi Chapelskyi Pod¹⁷, a wetland of importance for the temporary stopover of numerous migratory bird species and protected under the Ramsar Convention. More than half of the recorded fires occurred during this period (55% of the fires, based on an analysis of more than 8,500 observations^[25]).

It is unlikely that the extensive fires of 2023 completely destroyed the vegetation cover of the reserve, as most of them occurred towards the end of the growing season, when annual plants had already completed their life cycles.

The dominant steppe grasses listed in the Red Data Book of Ukraine generally lost only their above-ground parts and therefore retained their capacity for recovery. At the same time, communities of *Stipa capillata* were among the most severely affected, as the species was in the seed-ripening stage when the fires occurred: a substantial proportion of the seed material burned along with the dry grass. In some places, the intensity of the fire may have resulted in the death of individual tussocks.

The fires also damaged populations of the rare and vulnerable Taliev's cornflower (*Rhaponticoides taliewii*), which occurs in several compartments of the Pivdennyi massif.

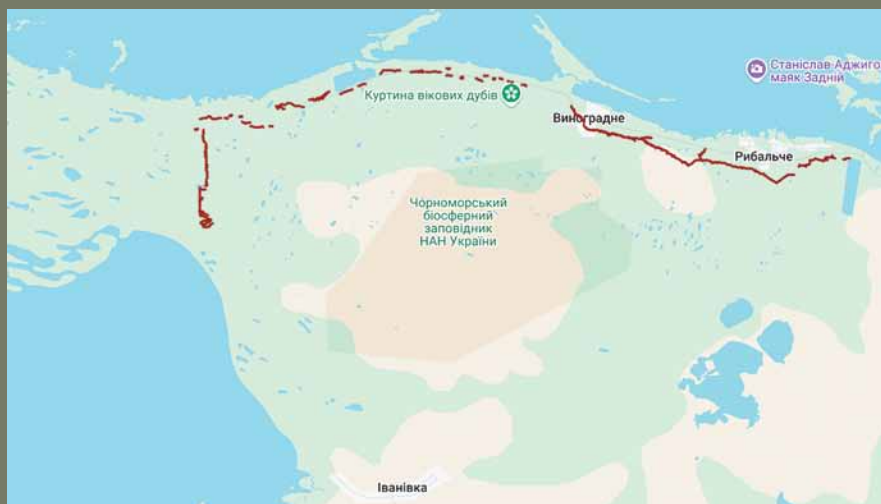
Invertebrates, particularly insects, suffered the greatest losses from the fires. Some reptiles may also have died because they were unable to escape the flames, although mass mortality among them is unlikely to have occurred.

At the same time, the impact of fires on the steppe ecosystem cannot be characterised simply as the complete destruction of the natural vegetation cover. Their effects always depend on a combination of factors, including the frequency and recurrence of fires, their extent, the time of year, the condition of the ecosystem before the fire, and subsequent human interventions.

Individual fires may temporarily maintain vegetation characteristic of steppe ecosystems. However, when the balance is disrupted, they can trigger the opposite processes – a shift from dry steppe towards wetter vegetation types and a profound restructuring of the natural ecosystem. In such cases, ecological recovery is set back.

Long-term monitoring data from Askania-Nova following the fires of 2013-2017 show profound and persistent changes: a decline in the area of typical steppe, reduced capacity for self-recovery, and a gradual shift towards meadow vegetation. Recovery to the previous state is possible, but it is slow and significantly delayed.

17 Pody (also known as steppe depressions or steppe “saucers”) are shallow, round or oval-shaped depressions found mainly on the plains of the steppe and forest-steppe zones.



Russian defensive line in the vicinity of the Black Sea Biosphere Reserve^[12]

Black Sea Biosphere Reserve

Kherson and Mykolaiv Regions

The reserve is under occupation

The Black Sea Biosphere Reserve is one of Ukraine's oldest protected areas, established in 1927. It protects a unique complex of coastal, steppe, and wetland ecosystems along the Black Sea coast and in the area of the Dnipro-Buh and Dnipro estuaries.

The reserve is one of the key strongholds for the conservation of natural ecosystems in southern Ukraine and is of international conservation importance.

Since the beginning of the full-scale invasion, communication with the Black Sea Biosphere Reserve has been virtually impossible. A significant number of its employees, including members of the administration, were taken captive or went missing. At the same time, russian media circulated information¹⁸ claiming that the reserve continued to operate. It was not until June 2025¹⁹ that the occupation authorities announced the establishment of a russian institution duplicating the Ukrainian reserve.

The reserve is located directly near the front line, opposite the city of Ochakiv, from where the russians anticipated a counteroffensive by the Ukrainian Defence Forces.

18 <https://xn----ttbgfagjn8f.xn--p1ai/novosti/pravitelstvo-utverdilo-postanovlenie-o-sozdanii-chernomorskogo-zapovednika/>

19 The russian clone also incorporated part of Mykolaiv Region that is not under occupation. This is not the first case in which russia has attempted to use the status of protected areas as an instrument of political manipulation (see the section “**Impacts on the Protected Areas Network: Policy**” for details).

The occupiers constructed a dense system of defensive fortifications around the reserve, including trenches, dugouts, and firing positions, and mined its surroundings (and, presumably, parts of the reserve itself). Due in part to the high density of landmines, the reserve is frequently affected by fires.

The high density of minefields and military presence create additional risks for natural ecosystems and complicate the implementation of conservation measures. The reserve's territory is regularly affected by fires. Since 2022, fires have damaged 1,964 ha, or 69.8% of the reserve's buffer zone. The largest fire occurred on 6-10 August 2025 and affected 1,291.5 ha. Over these five days, fire damaged 572.8 ha of the reserve and 718.7 ha of its buffer zone, accounting for 18.5% and 25.5% of their respective areas^[91].

The Ivano-Rybalchanska area was particularly severely affected by fire: between 2022 and 2025, fires damaged 98.7% of its territory.

Ukrainian Steppe Nature Reserve

Donetsk Region

The reserve is partially occupied and partially located along the front line

The Ukrainian Steppe Nature Reserve is one of the oldest nature reserves in Ukraine. It was established in 1961 to preserve virgin steppe ecosystems. It consists of four branches in Donetsk Region, most of which have been located in the zone of hostilities since 2014.



The territory of the Kreidova Flora branch, covered with explosion craters.

Source: Google Maps.



*Russian trenches within the reserve against a backdrop of burned floodplain meadows.
Photo by Serhii Lymanskyi*

As of early 2026, Russian forces had occupied virtually all of the reserve's branches and proclaimed a reserve called "Donetsk Steppe" on their basis^[87]. The "Kreidova Flora" branch, which remains under Ukrainian control, was also formally included in it. Thus, the entity established by Russia effectively duplicates the structure of the Ukrainian reserve (see the section "**Impacts on the Protected Areas Network: Policy**" for details).

The only unoccupied branch, Kreidova Flora, was twice located in an active combat zone: in 2014-2015 and following the beginning of the full-scale invasion in 2022. As a result of the hostilities, a substantial part of its chalk slopes and floodplain meadows was burned, while numerous explosion craters and military positions remained across the territory.

The Kalmius branch was directly located on the front line from 2015 to 2022. Military positions were established within its territory, including directly among natural granite outcrops, causing physical damage to the natural complexes.

Ivory Coast of Sviatoslav National Nature Park

Mykolaiv Region

The park is under occupation

Ivory Coast of Sviatoslav National Nature Park was established in 2009 and covers 35,400 ha of natural areas and adjacent waters of the Kinburn Peninsula. The park protects a diverse complex of sandy steppes, forests, floodplains, lakes, and coastal ecosystems of the Dnipro-Buh Estuary, Yavorlyk Bay, and the Black



*Russian trenches within the Kalmius branch of the reserve.
Source: Google Maps.*



*Consequences of the fire in the Khomutovskyi Steppe branch.
Source: Google Maps*

Sea. The Kinburn Peninsula is of particular importance for the conservation of wetland and coastal ecosystems and is an important breeding and seasonal concentration area for birds.

The Kinburn Peninsula is one of Ukraine's natural areas most severely affected by the war. From the beginning of the full-scale invasion until autumn 2023, 207 fires were recorded here, covering a total area of 6,347 ha, or approximately 61% of the park's territory. A substantial proportion of these areas subsequently burned again. Fires have therefore become a long-term driver of habitat degradation rather than a one-off consequence of hostilities.

Under occupation, park staff continued to monitor the territory remotely, including documenting the consequences of war-related fires within the park. To identify and assess the areas affected by fires, they developed a methodology for interpreting satellite imagery adapted to conditions of high cloud cover. The monitoring results were made publicly available on the ArcGIS online platform²⁰. In practice, this work established a practical approach to documenting war-related environmental crimes in protected areas under prolonged occupation.

Fires affected the main types of natural landscapes of the Kinburn Peninsula. Floodplains and wetlands, steppe and meadow areas, as well as natural and planted forests were affected. Species associated with pine stands and shrublands proved particularly vulnerable: the area of suitable habitat declined to 90% of its initial extent.

A significant proportion of the fires occurred during the bird breeding season and most likely resulted in the mass destruction of eggs and nestlings. Persistent noise from explosions, military vehicles, and military activities was an additional stressor. Recorded noise levels exceeded 100 dB, making the sound intensity 10,000 times greater than that of natural background noise, and substantially exceeding the threshold at which birds begin to suffer physiological damage to their auditory systems (for most species, the critical range begins at 85–90 dB). The noise disrupted breeding, caused colonies to break up, and led birds to abandon traditional breeding sites, particularly those used by waders and terns.

According to estimates by the park's scientists, fires destroyed nesting sites of approximately 100 bird species, representing the majority of the Kinburn Peninsula's breeding avifauna. All known breeding sites of the white-tailed eagle (*Haliaeetus albicilla*) were affected, and its winter roosting sites were also destroyed²¹.

²⁰ <https://arcg.is/TXuTn>

²¹ Chronicle of Nature of Ivory Coast of Sviatoslav National Nature Park, 2022–2024.

Consequences of the Destruction of the Kakhovka Hydropower Plant

An additional impact factor was the flooding following the destruction of the Kakhovka Hydropower Plant dam on 6 June 2023. The rapid rise in water levels caused approximately 2,530 ha of natural areas along the coast of the Dnipro-Buh Estuary to be flooded. Parts of lakes, the Biyenkovi Plavni tract, as well as steppe, meadow, and woodland and shrub areas of the park were submerged under contaminated water. As the flooding occurred during the bird breeding season, it resulted in the destruction of some nests and the death of nestlings of several species.

Holy Mountains National Nature Park

Donetsk Region

The park is located on the front line

Holy Mountains National Nature Park was established in 1997 in the valley of the Siverskyi Donets River in Donetsk Region and includes, among other valuable habitats, unique pine forests growing on chalk outcrops.

The national park became one of the large protected areas most directly affected by the war. Different parts of the park were under occupation from April to October 2022, while as of early 2026, the front line still ran through the park's territory.

Extensive mine contamination prevents full-scale forest management and complicates access for firefighting equipment. The accumulation of dry and damaged wood, in turn, creates conditions for further spread of fires.



Area of Holy Mountains National Nature Park before and after the hostilities.

Source: Google Maps.



Condition of the chalk pine forests in Holy Mountains National Nature Park following shelling and fires. Source: Google Maps.

In May 2023, researchers were able to assess the condition of the chalk pine forests in the Teplinska Dacha tract (north-western outskirts of the village of Bohorodychne, regulated recreation zone). Up to 40% of the trees were broken at various heights above the ground, while some showed signs of crown fires and fragmentation damage caused by shelling. Based on visual assessment, the soil and herbaceous cover had been disturbed across approximately 40–50% of the surveyed area^[68].

Due to the inability to conduct systematic monitoring, it is currently difficult to assess the natural recovery of the chalk pine forests after the fires. Nevertheless, given the substantial damage to all vegetation layers, it is already possible to conclude that the site has suffered a significant loss of conservation value and of its representativeness as a stronghold for the conservation of chalk pine forests. Once the area has been cleared of mines, it is highly likely that the issue of felling burned trees or partially clearing them will arise^[68].



*General view of the chalk pine forest near the village of Bohorodychne, May 2023.
Photo by Anna Kuzemko.*



*Condition of the tree layer in the chalk pine forest (compartment No. 40) within the park,
May 2023. Photo by Anna Kuzemko.*

Condition of the fire-damaged forest following the hostilities in 2022 within Holy Mountains National Nature Park, summer 2025. Photo by Olha Bohomaz.



Kamianska Sich National Nature Park

Kherson Region

The park is partially de-occupied and partially located on the front line

Kamianska Sich National Nature Park was established in 2019 to protect complexes of virgin steppe on the right bank of the Dnipro, as well as associated aquatic and coastal ecosystems in Kherson Region. Of particular conservation value are petrophytic steppes – plant communities formed on rocky areas with shallow soils.

The national park was under russian occupation for nine months, from 8 March to 11 November 2022. During this period, its territory was twice exposed to active hostilities, with fighting continuing in the area for approximately a month in autumn 2022. Despite the liberation of most of the park, as of early 2026, some areas remain close to the front line^[108].

Following de-occupation in 2023, park staff, together with experts from the international charitable organisation “Environment–People–Law”, began documenting war crimes against the environment. Field expeditions included establishing monitoring plots, collecting samples, conducting laboratory analyses, photographic and video documentation, and preparing records for the legal assessment of environmental damage.

The destruction of the Kakhovka Hydropower Plant dam in June 2023 caused short-term flooding of parts of the park. Park staff were among the first to assist in evacuating residents from areas affected by the flooding.



Trenches and remnants of destroyed russian military equipment within Kamianska Sich National Nature Park^[167].



*Russian dugouts camouflaged with destroyed feather-grass bushes, December 2022.
Photo by Ivan Moisiienko.*

Field surveys documented trenches, firing positions and dugouts, as well as tree felling and damage and remnants of destroyed military equipment. Military activities were accompanied by soil contamination with heavy metals and fuel and lubricants (see the section **“Impacts on the Protected Areas Network: Explosions of Ammunition”** for details).

Scientists documented cases where fortifications were camouflaged using rare plant species listed in the Red Data Book of Ukraine. Fortifications pose the greatest threat to the unique petrophytic steppes because natural fluctuation processes²² are almost absent there, while vegetation recovery is very slow^[108].

22 Natural fluctuation processes are natural, predictable changes in the state of an ecosystem that occur without direct human intervention.

The front line ran through the steppes of Kamianska Sich National Nature Park, and as a result, the park's territory was extensively mined by Russian forces. According to park staff, up to ten types of mines were identified. Following de-occupation, park staff, together with specialists from the Armed Forces of Ukraine and the State Emergency Service of Ukraine, took part in demining operations. During the clearance, approximately 200 tonnes of explosive ordnance were discovered and handed over to the military, including anti-tank and anti-personnel mines, unexploded shells, and rockets.

Shelling caused numerous fires that destroyed steppe vegetation in some areas. Although steppe ecosystems are generally adapted to periodic fire, fires at sites where military equipment had been destroyed had considerably more severe consequences.

Monitoring revealed a pronounced relationship between the extent of damage and the distance from the explosion site. In the zone of direct impact, all vascular plants, bryophytes, and lichens died, and no signs of recovery were observed even six months after the explosion. In the adjacent peripheral zone, the number of vascular plant species decreased by approximately half, while non-vascular organisms, particularly the soil lichen *Placidium squamulosum*, remained especially vulnerable and showed signs of thermal damage.

Rocky areas proved more resilient: the epilithic lichens *Verrucaria nigrescens*, *V. viridula*, and *V. muralis* showed no visible damage. In the less severely affected zone, up to 77% of species diversity recovered, including protected species such as Scythian broom (*Genista scythica*) and feather grass (*Stipa capillata*). At approximately 5 m from the explosion epicentre, typical petrophytic steppe vegetation had already begun to re-establish^[47].

Thus, the impact of hostilities on Kamianska Sich is spatially heterogeneous and mosaic-like. The greatest biodiversity losses occur in the immediate central zones of explosions, while natural communities in peripheral areas demonstrate a capacity for gradual recovery. For animals, the effects of explosions may include both direct mortality and prolonged avoidance of damaged areas^[69].

Oleshky Sands National Nature Park

Kherson Region

The park is under Russian occupation

Oleshky Sands National Nature Park was established in 2010 to preserve valuable natural and historical-cultural complexes of the northern Black Sea region.

Oleshky Sands National Nature Park was likely one of the first protected areas to experience hostilities following the beginning of the full-scale invasion. Its location

along the route of the Russian military advance from Crimea in February 2022 meant that the park was among the first protected areas to enter the zone of hostilities. A military unit and the Radenske tank training ground are also located nearby, as is a railway line from Crimea running through the neighbouring village of Radensk.

In the first days of the invasion, the park's administrative buildings were seized and looted. Shelling and active hostilities in adjacent areas damaged the park's natural complexes, and most of its staff were forced to evacuate^[42].

According to Global Forest Watch, in 2022 the national park lost approximately half of its protective forest belt within a few months. This substantially weakened the ecological resilience of the area^[110].

Fires continued to occur in subsequent years. In particular, on 1 October 2023, a Sentinel-2 satellite operated by the European Space Agency detected seven fire hotspots in coniferous forests on the outskirts of the national park. The total area affected by fire was approximately 135 km²^[78].

The destruction of the Kakhovka Hydropower Plant dam in June 2023 caused a temporary rise in the groundwater level within the national park. This particularly affected the population of Dnipro birch (*Betula borysthena*) – a rare species that forms small groves around small water bodies within sandy landscapes. According to available data, the largest recorded rise in groundwater levels associated with this technological disaster occurred within the national park^[45].



*Pine forests destroyed by fires on the outskirts of the park, 2024.
Source: Google Earth.*



*Distribution of Dnipro birch (*Betula borysthenea*) in areas affected by flooding and rising groundwater levels following the destruction of the Kakhovka Hydropower Plant dam^[45].*

State Measures and Legislative Changes in the Field of Protected Area Management During the War

At the beginning of the full-scale invasion, most protected area institutions did not have specific contingency plans for occupation, prolonged loss of communication, or hostilities. Procedures for evacuating staff, archives, founding documents, collections, and critical equipment had not been established in advance^[47].

Following the beginning of the full-scale invasion, notification systems were established within protected area institutions to alert managers and staff to potential threats. However, no systematic mechanism for evacuating staff from territories at risk of occupation had been developed at the central level

Following occupation, the state restricted Treasury operations for institutions located outside Ukrainian-controlled territory in order to prevent the seizure of public funds. This decision complicated the financing of staff and critical functions, particularly in institutions responsible for animals, pumping systems, and living collections.

Documenting environmental crimes became one of the state's main priorities from the first weeks of the full-scale invasion. In particular, the Ministry of Environmental Protection and Natural Resources published weekly digests [51] in Ukrainian and English, including information on damage to protected area institutions. An Operational Headquarters was established under the Ministry of Environmental Protection and Natural Resources of Ukraine to collect and consolidate information on environmental damage caused by the occupying forces. At the central level, a Procedure was adopted, followed by a Methodology for determining the damage and losses caused to protected areas and sites as a result of the armed aggression of the Russian Federation^[47].

According to the Methodology, the facts and extent of damage and losses affecting protected areas are established by commissions set up by military administrations, with mandatory participation of representatives of the administrations of the respective protected areas and sites. The assessment is to be carried out through field inspections of protected areas, analysis of Earth observation data, examination of expert assessments and other official documents, and information provided by individuals and legal entities^[47].

Protection of the State Border and Expansion of the Border Strip

On 24 February 2023, the Verkhovna Rada of Ukraine adopted amendments to legislation aimed at strengthening state border protection, including extending the border strip to 2 km^[60].

This decision has direct implications for the Protected Areas Network, as valuable forest, wetland, and other natural ecosystems are located along Ukraine's borders with Russia and Belarus. Some of these areas have national and international conservation status.

The new law established a special legal regime for Protected Areas Network lands within the border strip through amendments to the Law of Ukraine "On the Protected Areas Network of Ukraine". Under these amendments, border guards are authorised to manage protected areas falling within the 2-km strip, alter their boundaries, and even revoke their protected status without approval from the Ministry of Environmental Protection and Natural Resources. Land along the state border has been transferred to military units of the State Border Guard Service of Ukraine (SBGS) for the construction and installation of communications infrastructure, engineering and technical structures, fortifications, fences, border markers, and firebreaks. However, the SBGS is not a specialised institution responsible for nature conservation. This transfer may therefore pose a threat to nationally and internationally important natural areas.

Crucially, this concerns not only temporary restrictions on economic activities within protected areas, but also the possibility of changing their boundaries or category or fully revoking their protected status. Under the ordinary procedure, such decisions are subject to the procedures established for the creation and designation of protected areas and sites: relevant documentation and proposals are prepared, undergo consultation and preliminary review, while changes to boundaries or categories, or revocation of protected status, are based on an expert assessment.

For protected areas within the border strip, the law introduced a simplified mechanism for the duration of martial law. Their boundaries or categories may be changed, or their protected status revoked, for the construction and development of border infrastructure upon a proposal from the central executive authority responsible for implementing state policy on state border protection, without applying certain standard nature conservation procedures. At the same time, the amendments do not provide for compensation mechanisms or the establishment of alternative protected areas to replace those lost.

The proposed 2-km border strip covers one of the most valuable and least-disturbed natural areas in northern Ukraine. It encompasses approximately 120,000 ha of Protected Areas Network land, a substantial proportion of which

consists of forest, marsh, and wetland ecosystems of Polissia. Particularly important are the natural complexes along the Prypiat River valley, which form a transboundary ecological system with the territories of Belarus.

Approximately 65,000 ha of the Protected Areas Network along the border with Belarus and 56,000 ha along the border with Russia fall within the 2-km strip, covering around 90 areas of different categories in total. These include the Chernobyl Radiation and Ecological Biosphere Reserve (25,900 ha within the strip), as well as Rivnenskyi and Poliskyi Nature Reserves (6,900 ha), which have the strictest protection regime, among others. For some areas, the total area falling within the border strip constitutes a substantial proportion of their total territory. In some cases, its removal could effectively prevent these areas from continuing to fulfil their conservation functions.

Of particular importance is the fact that more than half of the area of the border strip along the border with Belarus consists of Emerald Network sites, which are protected areas of European importance. Some protected areas also have international status as Ramsar Wetlands of International Importance or UNESCO biosphere reserves under the Man and the Biosphere Programme. Therefore, changes to the boundaries or revocation of the protected status of sites in this zone could have implications not only for Ukraine's national nature conservation system but also for the fulfilment of its international biodiversity conservation commitments [44]. In addition, in 2007, the primeval forests of Uzhanskyi National Nature Park were included in the serial transboundary UNESCO World Heritage property Primeval Beech Forests of the Carpathians, which was inscribed on the World Heritage List by Decision 31 COM 8B.16 of the World Heritage Committee. The vast majority of this property is also located within the border strip and may be at risk of loss.



Emerald and protected areas located along part of Ukraine's state border (green – designated protected areas; pink and orange – Emerald Network sites at different stages of designation; yellow – the border strip)^[27].



Areas of Nobel National Nature Park falling within the border zone (outlined in red)^[27].

Although the special procedure formally applies only for the duration of martial law and one year after its termination, the legal consequences of decisions adopted under it may be long-lasting. The law does not provide for the automatic recovery to the Protected Areas Network of areas whose boundaries have been changed, or the reinstatement of the protected status of sites whose designation has been revoked.

Relaxation of Restrictions Economic Activities within the Protected Areas Network

During the full-scale war, the procedure for environmental impact assessment (EIA), one of the key instruments for preventing the negative effects of economic activities on natural areas, was also amended. At the beginning of 2022, a law^[59] was adopted allowing certain projects aimed at eliminating the consequences of armed aggression and restoring critical infrastructure to be implemented without undergoing an EIA. This provision also applied to projects implemented within protected areas.

This law created additional risks for the Protected Areas Network, as projects potentially harmful to natural ecosystems could be exempted from EIA if they were formally classified as reconstruction projects.

Subsequently, the timeframe for conducting an EIA procedure was also shortened from 216 to 67 days^[62]. This accelerated project approval under martial law, but at the same time reduced the time available for analysing environmental risks, preparing comments, and public participation in the procedure.

Challenges after De-occupation

Restoring de-occupied territories became the second-highest priority for the state after liberating territories from russian occupation. In practice, however, priority has been given to restoring critical infrastructure, ensuring security, and supporting the local population. The recovery of protected areas and the operational capacity of their institutions remain lower-priority areas.

As of early 2026, the Chornobyl Radiation and Ecological Biosphere Reserve, Desna-Stara Huta National Nature Park, Hetmanskyi National Nature Park, Holy Mountains National Nature Park, and Kamianska Sich National Nature Park (the latter two partially) had returned to Ukrainian control. At the same time, Dvorichanskyi National Nature Park, which had been de-occupied at an earlier stage, subsequently came under russian occupation again.

A common challenge facing protected areas after de-occupation is security: their territories may be mined, damaged by shelling, or used for defensive fortifications. Even after liberation, some areas remain inaccessible for full-scale conservation management because of the risk of renewed shelling or sabotage activities. For example, most of Desna-Stara Huta National Nature Park is formally under Ukrainian control but remains within a mandatory evacuation zone because of security risks.



Another major issue is institutional staffing capacity. The mass departure of employees from temporarily occupied territories and areas of active hostilities, the mobilisation of men, and the deaths of protected area employees while defending Ukraine have substantially reduced the staffing capacity of the Protected Areas Network. Some employees remain in russian captivity. As a result, even after de-occupation, institutions do not always have sufficient staff to resume full-scale operations.

Funding remains an equally acute problem. Following de-occupation, state funding for protected area institutions is restored, but it primarily covers protected budget expenditures, particularly salaries and utility costs. Funding for the reconstruction of damaged administrative buildings, procurement of equipment, infrastructure recovery, and comprehensive conservation measures remains limited. A telling example is that in 2022, only around 30% of affected protected area institutions received humanitarian or material assistance from the state or through state-supported channels^[47].

Another consequence of occupation is the transformation of how the institutions themselves operate. As of early 2026, the vast majority of administrations of protected areas that were occupied after 2022 continue to operate remotely from Ukrainian-controlled territory. The exception is Kreminski Lis National Nature Park, whose operations, according to available information, have not been restored by the State Agency of Forest Resources of Ukraine.



Destroyed russian military equipment, Kyiv Region. Photo by Olesia Bezsmertna.

Conclusions

The full-scale war of 2022–2025 has significantly altered Ukraine’s ecological map. Most of the losses inflicted on the Protected Areas Network are irreversible, but at the same time, they have resulted in the emergence of new dynamic landscapes where nature is reclaiming space previously taken over by human activity.

Looking ahead, the key tasks should include not only documenting losses, but also systematically planning for recovery. This means moving from attempts to quantify the damage towards modelling scenarios for ecosystem development after the war, identifying areas with the greatest potential for natural regeneration, identifying areas where active interventions are needed, and integrating this knowledge into spatial planning and demining policies. Monitoring should combine remote-sensing methods with a network of permanent field plots where long-term changes in soils, vegetation, and fauna can be tracked.

A separate risk is that large-scale post-war reconstruction programmes implemented without prior environmental assessment could rapidly destroy ecosystems where natural regeneration processes have already begun. Whether these processes will support biodiversity recovery or will be disrupted by haphazard post-war exploitation will depend on how early and how seriously conservation priorities are integrated into the country’s recovery policies.

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Наукове видання

Анна Ковбаснюк, Олексій Василюк, Єлизавета Темченко,
Вікторія Губарева, Віктор Пархоменко, Олександр Ходосовцев

**Protected Areas Network of Ukraine:
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against Ukraine**

Англійською мовою

Редактор Людмила Звенигородська

Переклад Олени Кривик

Макет Надії Антонової

Фото на обкладинці Ольги Богомаз

Підготовка до друку Андрія Добрянського

Підписано до друку 08.09.2026. Формат 60×84/16.

Папір офсетний. Гарнітура PT Sans, PF Square Sans Pro. Друк офсетний.

Ум. друк. арк. 4,19. Тираж 200 прим. Зам. 261435.

Видавець ТОВ «Друк Арт»

58018 Чернівці, вул. Маловокзальна, 2Д, тел. 585-432

Ліцензія про державну реєстрацію ДК № 2741 від 15.01.2007 р.

Виготовлювач ФОП Варвус В. В

