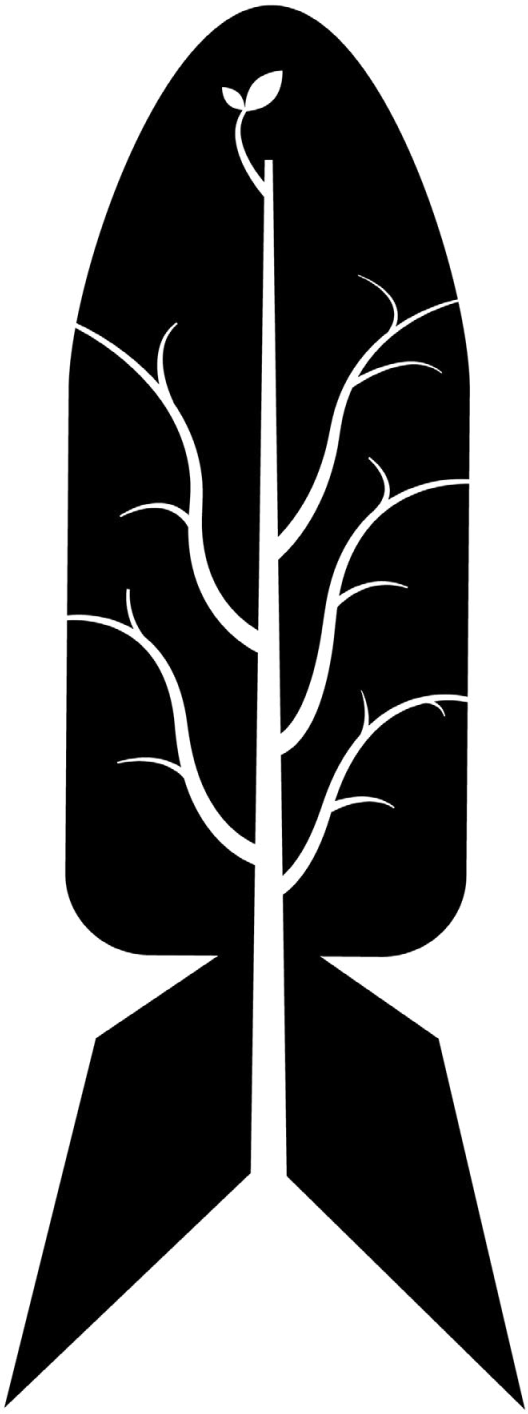

UWEC

Ukraine War Environmental Consequences Work Group

Issue #20

2024 UWEC work group

Dear Friends!

Today, Russia has renewed its energy terrorism attacks in Ukraine. Increasingly, thermal power plants, hydroelectric power plants (HPPs), and other energy centers are under attack. These attacks are made with the intent to sow panic among Ukrainians and to bring about the collapse of the country's energy supply system. A number of large cities, including Kharkiv, have been left without power due to this shelling. Kyiv's Trypilska, the city's largest thermal power plant was destroyed. Ukraine's response has been to conduct targeted strikes on Russian oil refineries. This results not only in disruptions to energy infrastructure and temporary blackouts, but also has a serious impact on the environment, such as petroleum product spills and atmospheric emissions at thermal power plants and gas and oil storage facilities. Restoring energy systems also requires additional resources.

Dniprovska HPP was damaged by shelling on 22 March. Its destruction has the potential to result in a localized environmental catastrophe, as occurred at Kakhovka HPP in June 2023. Although the dam was not breached at this time, the shelling did cause a fuel leak that is polluting the Dnipro River watershed:

- **Latest Russian attack on Dnipro HPP**

Environmental problems caused by the war are aggravating the consequences of climate change. The first month of spring not only broke temperature records, but was also marked by severe flooding. Although the situation in Ukraine was not as catastrophic as in Russia and Kazakhstan, where the Orenburg and Aktobe regions were inundated, spring floods are nevertheless significantly changing the landscape, especially in war-affected areas. In particular, the basin of the former Kakhovka reservoir was flooded again. Read about spring floods around Kakhovka and the war's other environmental consequences in our monthly review:

- **Environmental consequences of Russia's war in Ukraine. Review: March 2024**

The war is also changing supply chains, directly affecting environmental conservation in different countries. We have written previously about the environmental impacts of navigational changes on the Danube River brought about by Russia's full-scale invasion. Over the past year, the situation has not improved and today the Danube Biosphere Reserve in the Danube River delta is also threatened. Dredging and other canal expansion work not only reduce the success of biodiversity restoration programs, but also interfere with the operations of protected areas.

- **More dredging, more freight: How the war in Ukraine threatens the Danube River Biosphere Reserve**

The war's effects can be felt even in the Arctic. Programs studying this region – an area experiencing catastrophic damage from climate change – are on the verge of failure after the start of the full-scale invasion. Without scientific collaboration, it is almost impossible to conduct international research in the Arctic. Meanwhile, the outbreak of Russia's full-scale war in Ukraine has resulted in the growing isolation of Russia's scientific community. Both the West and Russia itself are refusing to engage in cooperation, increasingly resulting in closing scientific spaces behind a new "Iron Curtain". Margaret Williams, senior fellow at the Arctic Initiative at the Belfer Center for Science and International Affairs at the Harvard Kennedy School of Government, examines ways to avoid the loss of collaborative research efforts focused on the Arctic:

- **What does Russia's war in Ukraine mean for global biodiversity conservation efforts?**

The consequences of the war in Ukraine will affect life and ecology in the region, perhaps for decades. It is important not only to collect data today, but also to seek solutions to these environmental problems. In 2023 and 2024 we collaborated with Reporters Without Borders and the Svea Green Foundation on a webinar series sharing data collection methods and ways of covering the war's environmental consequences. UWEC experts and members of our editorial team are also regularly invited to present at other events. You can read a summary of these events, as well watch them in this special summary:

- **Looking back on our 2023-2024 webinar series**

You can read all of our analysis and news of the environmental consequences of Russia's invasion of Ukraine on our website, as well as on Twitter (X), Facebook and on Telegram.

We wish you strength and peace!

Alexej Ovchinnikov, editor of UWEC Work Group

About the new Russian missile attack on the Dnipro HPP in the morning of March 22, 2024.

UWEC Work Group editorial team

Large energy facilities of Ukraine (such as hydroelectric power plants and nuclear power plants) are again being attacked by the Russian Federation in order to sow panic. This, as we explained earlier, indicates the systemic risks associated with the creation and use of large, dangerous energy facilities, such as Zaporizhia NPP or Dnipro HPP.

In Zaporizhia in the morning of March 22, numerous rockets were launched, with estimates ranging from two to eight hits targeting the Dnipro HPP.

Judging by the pictures published on the network, a trolleybus with people who were going to work and did not suspect anything was destroyed right on the dam. Eternal memory to the innocent victims of Russian aggression…

The machine room, where there are containers with technical oils and other flammable liquids, is on fire. Power equipment is likely damaged. Transformers may also be burning or destroyed. As a result, contamination of the Dnipro River with oils and petroleum products used at the hydroelectric power station is observed.

The head of Ukrhydroenergo Ihor Syrota said that both engine rooms of Dnipro HPP (No. 1 and No. 2) were out of order, while the foundation of the engine room of HPP-2 was damaged, which will require long-term repairs. All the water that used to go through the turbines will be discharged without generating energy. There is no risk of a dam breach.

Indeed, significant damage to the dam itself is extremely unlikely due to its massiveness. It is well known that repeated shelling failed to significantly damage the Kakhovka HPP (only the lock was damaged by shelling) and it was blown up from the inside by retreating Russian troops. The great dams of the USSR were built taking into account the threat of even a nuclear attack.

In the highly unlikely event of uncontrolled significant water discharge through the dam, the excess water would be accommodated by the vast empty capacity of the former Kakhovka Reservoir. As rightly pointed out by environmental expert Natalia Gozak, the total capacity of the Dnipro HPP reservoir is 3.3 km3, and all this water can be accommodated multiple times in the dried-up basin of Kakhovka (with a capacity of 18 km3).

Therefore, under any scenario, neither the Zaporizhia NPP nor the settlements on the shores of the former reservoir are threatened by flooding. There is only a small possibility that there will be a threat of flooding of the southern micro-districts of the city of Zaporizhia immediately downstream of the dam.

The increased risks for the Zaporizhia NPP as a result of the Russian attack are not associated with the prospects of flooding, but with the cessation of electricity supply via one of the two power lines, which has happened before.

Russian propaganda began actively spreading fears of a "tsunami and atomic apocalypse in the event of a breach of the Dnipro HPP" as early as 17 hours before the attack. It continues to spread these fears even now, after the attack. This is a deliberately planned campaign of intimidation, where the hypothetical breach of the hydroelectric power plant and the "possible" damage to the nuclear power plant are used as the main means to sow panic. The threat of the dam's destruction serves as a powerful psychological weapon aimed at the vulnerable population.

> The capacities of Dnipro HPP are very useful for increasing the maneuverability of the energy

system of Ukraine, but are not critical for its functioning in general, especially after connection to the pan-European system. An attack on the country's power system may lead to local blackouts, but it will not become critical, since spring has already arrived and there is no threat of freezing of cities.

European banks have already allocated substantial funds for the operational repair and modernization of both the Dnipro HPP (EUR 200 million from the European Bank for Reconstruction and Development) and the rest of the Dnipro Cascade (EUR 130 million from the European Investment Bank). There are similar lines of financing for the restoration of CHP and transmission lines. Therefore, we hope that today's attack should not lead to a long-term decrease in the efficiency of the power system.

Russia counts on its strikes to exert powerful psychological pressure on the population of Ukraine, but knowing the actual state of affairs and understanding the means to address the problems created by the attack, there is no need to succumb to panic. •

Main image credits: photo by Denys Shmyhal

Environmental consequences **of Russia's war in Ukraine.** Review. March 2024

Alexej Ovchinnikov

Each month, the UWEC editorial team shares highlights of recent media coverage and analysis of the Ukraine war's environmental consequences with our readers. As always, we welcome reader feedback, which you can leave by commenting on texts, writing to us (editor@uwecworkgroup.info), or contacting us via social networks.

CEOBS publishes preliminary environmental impact assessment of the first year of full-scale invasion

The research group Conflict and Environment Observatory (**CEOBS**) has joined forces with Zoi Environment Network to publish an overview of the

environmental consequences of the Russian war in Ukraine, comparing the environmental situation in the country before and after the full-scale invasion. Prior to February 2022, the main environmental problems of Ukraine were typical for an industrial country: pollution and water shortages, household and industrial waste, air quality.

Ukraine has since 2014 proclaimed an intention to reorient itself toward European "green values", including the transition to a green economy. In Ukraine, the presence of occupied territories, such as Crimea and parts of the Donetsk and Luhansk Oblasts, where it was impossible to conduct a full environmental analysis, further complicated matters for researchers.

The report presents war's main environmental consequences, such as bombing of industrial and energy infrastructure, danger of radiation pollution, destruction in cities and rural areas (such as ruined infrastructure), elimination of waste building material resulting from munitions fire and combat action, etc., as well as the war's impact on water infrastructure and coastal and marine environments. Published in the form of an infographic, the report also shows the impact of the war on renewable energy development, a topic that has received little media coverage in the context of the war's environmental consequences. The report illustrates the decision-making system for environmental issues and shows the procedures followed by various institutions – from the Ministry of Environment and Natural Resources to local inspectorates. Strangely, however, the study did not take into consideration the role of NGOs – the foundation of Ukraine's environmental movement – and their ownership of a significant number of projects aimed at environmental recovery.

The report makes recommendations for analyzing and addressing the environmental consequences of war that are of particular interest and which include both sector-specific and general proposals. The recommendations have various aims: increasing the level and quality of monitoring and analysis; developing special proposals and analyses; improving the quality of standards and risk evaluation; involving citizens in problem-solving; locating financing for projects; training for specialists; and ensuring standardization of the analysis of environmental consequences.

Access the report: "Environmental consequences of the war against Ukraine. Preliminary twelve-month assessment (February 2022 – February 2023). Summary and Recommendations."

CEOBS and Zoi Environment Network frequently publish reports and recommendations for assessing the environmental consequences of

the invasion of Ukraine. For instance, they are developing documents for the Environmental Compact for Ukraine, which we covered in our previous review.

In February the group published a supplement to the Compact, titled "Assessing Environmental Damage in Ukraine". It notes the lack of data collected on the environmental consequences of Russia's invasion and proposes to improve the methodology for collecting and analyzing data on environmental damage. The supplement recommends making improvements to the collection, storage, and analysis of field data using a comprehensive strategy for collecting and storing data that aligns with best global practices and meets Hague Register of Damage standards as well as by establishing a monitoring plan to be integrated into the strategic plan for Ukraine's recovery.

Ecodiya announces volunteer project to collect data on environmental damage caused by the war

The Kyiv-based environmental organization has launched an interactive map project to collect data on crimes committed against nature after the beginning of the full-scale invasion.

Since August 2022, this data gathering has been carried out by volunteers who collect information in the following categories: impact on ecosystems, nuclear safety, energy safety, damage to industrial sites, pollution by livestock waste, and impacts on marine ecosystems.

Thirteen volunteers are currently working on the project. Their main approach involves finding open-source information, such as that available on Telegram channels and in mass media, and then verifying it. The data is entered into tables, where it is then used to fill out and update the map. In just 18 months of volunteer work, 1,549 crimes against the environment have been recorded.

The involvement of volunteers and civilians for documenting crimes against nature in the conditions of the full-scale war is important work and helps to collect and process large volumes of data. This data will not only support the calculation of reparations and compensation for the damage inflicted, but will also aid in formulating a plan for the country's recovery. Volunteers can also be of assistance in monitoring biodiversity in areas damaged during combat action, as well as tracking the spread of invasive species and identifying which native species are the most affected as a result. The iNaturalist platform can assist in this process.

A new platform for collecting data on the consequences of the war

Svidok (Witness) is a resource for gathering information about crimes

and the consequences of the war; it allows citizens to submit details of the deaths of civilians and soldiers. The Ministry of Environmental Protection and Natural Resources of Ukraine reports in its periodic digest that the resource also collects information about environmental damage sustained during the war.

The aim of collecting information on crimes against nature is to bring the aggressor country to justice for ecocide. Citizen testimony can later be used in international courts, creating a needed eyewitness database.

Information about the pollution of water and air resources, mined areas, destruction of biodiversity, killing of animals, and other significant consequences for the environment is also collected in this project.

The initiative is supported by the AI for Good Charity Foundation and Sunflower Collective.

Impact of war and sanctions on Russia's forests

The independent Russian environmental media outlet Smola has prepared a text on how the rift with the West has affected the Russian (and Belarusian) timber industry.

In July 2022 Russian and Belarusian logging sectors came under sanctions, which meant a ban on the export of timber to the European Union. Before the full-scale war, exports to the EU made up 14% of Russian timber sales. The main international certification systems for sustainable forest management, such as FSC and PEFC, also exited Russia and Belarus.

Blocked access to eco-sensitive Western markets and the departure of certifying organizations has naturally had a negative effect on forest management rules. Although the majority of companies still try to follow sustainable principles, some companies have carried out defiant logging of valuable areas of forest. Yet, as the author of the article notes, reduced demand for timber had led to only insignificant reductions in logging. The timber industry is simply coasting and reacting very slowly to the changes.

International certifiers have been replaced by local equivalents, such as "Lesnoi Etalon" ("Forest Standard"), Ustoichivy Les ("Sustainable Forest") and others. However, their influence is limited when compared to, for example, FSC. In addition, Russian companies are not showing any particular interest in purchasing certified wood. For instance, one of the main consumers of certified timber products in Russia was McDonalds, which used it in the manufacture of paper bags. The company that has replaced it, Vkusno – i Tochka, has little interest in certifications and is willing to work with any logging company.

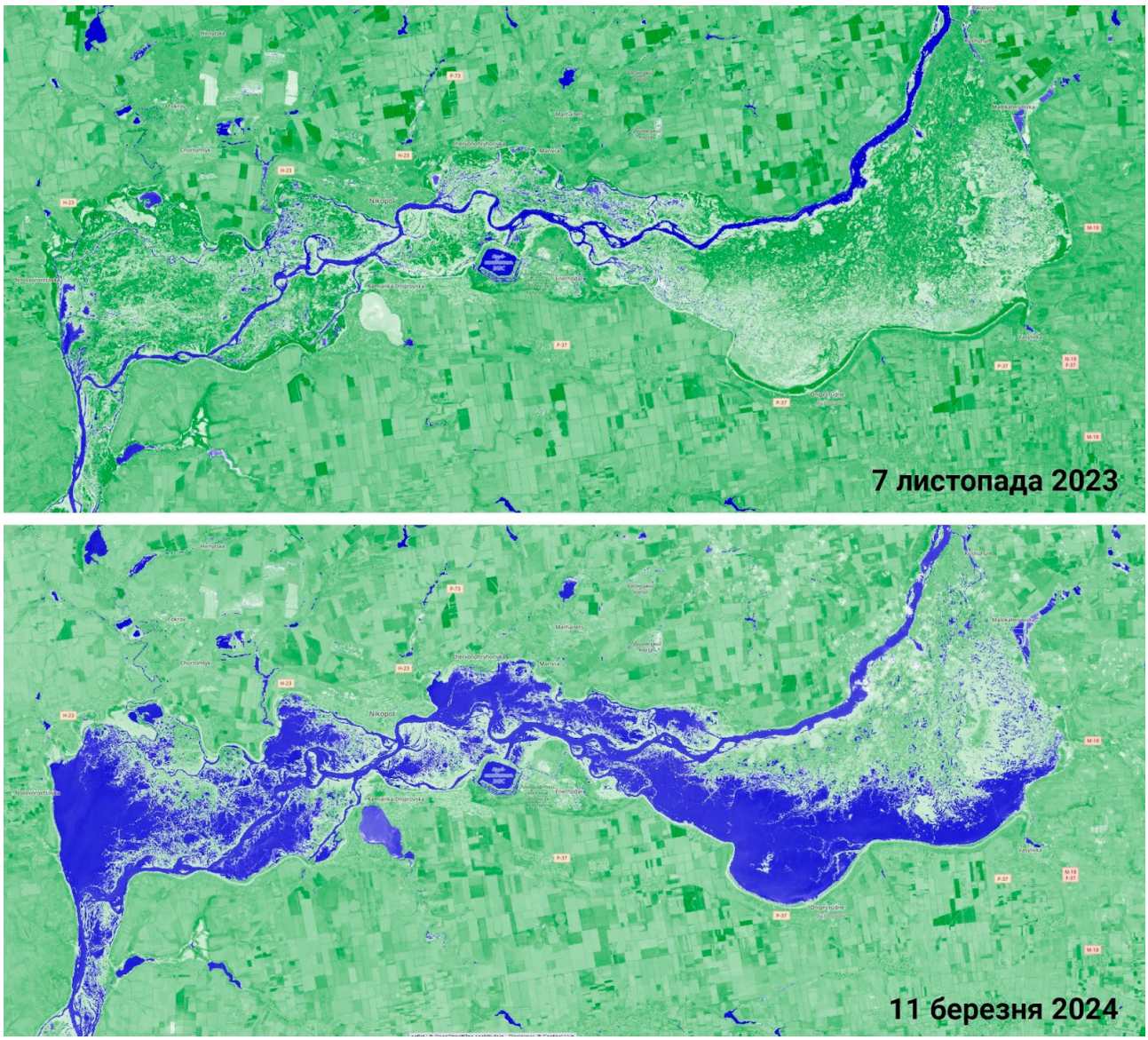

Fig. 1-2. The area formerly covered by the Kakhovka Reservoir in November 2023 and March 2024. Source: texty.org.ua

To cover the losses sustained from reduced exports (Russia exported $3 billion worth of forest products to EU countries in 2021), Moscow has reoriented its market eastward. China is the main consumer of Russian pulp today. However, some companies, such as those producing wood pellets and paneling, were unable to adapt after losing access to Western markets. Nonetheless, the sector has adapted on the whole and today roughly 92% of Russian timber sold is on the Asian market.

In conclusion, the author of the article points out that the sanctions and departure of international certifying bodies stemming from Russia's invasion of Ukraine have had no constructive impact on the forestry industry in Russia. There has been a slight decrease in logging volumes, but most

timber harvesting now occurs without sustainable certification. In any case, Russian timber is still reaching European and U.S. markets via third countries such as Kyrgyzstan, Uzbekistan, and Vietnam, among others.

The former Kakhovka reservoir underwater once more

The territories of Velykyi Luh, uncovered after the destruction of the Kakhovka hydroelectric power station, are experiencing spring flooding for the first time in half a century. As Hrihory Kolomitsev, a junior researcher at the Schmalhausen Institute of Zoology (National Academy of Sciences of Ukraine) notes in a comment made to the texty.org.ua media resource, floods are a typical situation for areas in the lower reaches of the Dnipro (Dnieper) River. Today we are witnessing processes that are natural for unregulated parts of a river floodplain.

Despite the destructive and catastrophic consequences of the war, we are also becoming witnesses to nature's capacity to restore its natural rhythms in places where the anthropogenic load is reduced or disappearing. The way nature has recovered so quickly in this region gives hope and belief that Ukraine too can recover so quickly after the war ends. •

Main image: Velykyi Luh National Park.
Source: wownature.in.ua
Credit: Vikor Busel

More dredging, more freight: How the war in Ukraine threatens the Danube River Biosphere Reserve

Viktoria Hubareva
Translated by Alastair Gill

Since the latter half of 2023, the Danube Biosphere Reserve has been closed to tourist visitors and partially even to representatives of academic institutions. Russia's invasion of Ukraine in 2022 forced Kyiv to seek additional logistics solutions, reigniting a longstanding dispute between Ukraine and Romania over the deepening of the mouth of the Danube (known as the Dunai River in both Ukraine and Russia) and its use in shipping. What are the potential environmental consequences of an increase in dredging and cargo traffic in the Danube Delta?

Included in the World Network of Biosphere Reserves in 1998, the Danube Delta Transboundary Biosphere Reserve is made up of

Fig. 1. The Danube Delta Transboundary Biosphere Reserve. Source: Zhanna Sribna.

two parts: the Danube Biosphere Reserve on the Ukrainian side and the Danube Delta Biosphere Reserve on the Romanian side. Together these territories form a labyrinth of water and land, made up of a multitude of lakes, channels, and islands in the lower Danube with a total area of 7,322 square kilometers. The Danube Delta is Europe's largest delta ecosystem after the Volga, and also the continent's second-largest water purification system. 350 bird species use the river delta during migration, wintering, or as a year-round habitat. The reserve is also home to more than 100 species of fish, including sturgeon populations. The delta also serves as one of the last refuges for European mink, wildcat, and river otter.

Although only 25% of the Danube Delta falls within Ukrainian borders, these are important territories, and the delta is sometimes called the "European Amazon" for its diversity of plants, birds, animals, ichthyofauna, and invertebrates.

Unsurprisingly then, before the war the reserve was a popular destination for tourists, who came for kayaking and boating trips. Visitors could see the delta's recently reintroduced water buffalo, admire the local population's floodplain community gardens and vegetable patches at the Danube's symbolic "zero kilometer", and even

Fig. 2. A pink pelican in the Danube Delta Biosphere Reserve. The delta is home to the largest population of pink pelicans in Europe. Source: Maksim Yakovlev

stay at campsites in dense, tangled forests.

The Danube Reserve is an area of captivating and distinctive beauty, but it has been impossible to reach it on the Ukrainian side since 2023. Access was restricted for good reason: in 2022 Ukraine was fighting for control of Snake Island, and amphibious enemy reconnaissance groups also entered the Danube.

What has changed since the beginning of the war? What is the problem?

To learn about the current situation, we contacted the Danube Delta Biosphere Reserve, which sits on the Romanian side of the border and which forms part of a joint reserve with the Danube Biosphere Reserve. A spokesperson told us that the most obvious effect of the war is a decrease in the number of tourists in comparison with previous years. In addition, Romania also noted a significant increase in the number of cargo vessels in the Danube's transformed Sulina distributary.

However, it is not only the Sulina canal that saw greater numbers of ships. After the beginning of the full-scale war, Ukraine resumed use of one of the mouths of the Danube as a transport artery.

Cargo ships in the reserve: how does it work?

Oleksandr Voloshkevich has been in charge of the Danube Biosphere

Fig. 3. On a tour of Yermakov Island you may encounter water buffalo, which were introduced here in 2019 by the Rewilding Ukraine organization as part of a project titled "Restoration of the wetlands and steppes of the Danube Delta region". Marvelous "architects" of nature, water buffalo help preserve the patchwork landscapes and biodiversity of the islands. Source: Zhanna Sribna

Reserve for more than 30 years. In this time he has attended hundreds of court hearings, many of which concerned the construction of the deep-water Danube–Black Sea Canal. This long-running saga, which has dragged on since the 2000s, gained fresh momentum in 2023.

> The Danube is one of Europe's biggest rivers, and its attractiveness for shipping is inestimable. Most cargo transport passes into and out of the Black Sea along the Sulina Channel, one of the Romanian branches of the Danube. Since the early 2000s, however, Ukraine has wanted to use a different branch of the Danube for shipping, located on Ukrainian territory – the Bystroye Canal (another transformed Danube delta distributary).

The global community reacted firmly to news of Ukraine's plans to develop the canal: in 2004 over 50,000 organizations and individuals from 90 countries came out in defense of the Danube Biosphere Reserve between May and October alone. The Standing Committee of the Bern Convention and

Fig. 5. A ship passing through the Danube Delta Biosphere Reserve in summer 2023. The waves raised by ships contribute significantly to the erosion of banks in the delta. Source: Zhanna Sribna

the Espoo Convention Commission passed resolutions, while the European Commission and the International Commission for the Protection of the Danube recommended suspending the project. Construction continued despite all appeals, but the canal never became fully operational. In order to be suitable for navigation, the Bystroye Canal must be constantly deepened and dredged of silt. This turned out to be too expensive a solution, so the project was eventually abandoned.

But with the outbreak of full-scale war in 2022, Ukraine suddenly needed to be able to transport goods by sea. By early 2023, Ukraine had already deepened the Bystroye Canal to almost twice its previous depth, a move which could have serious consequences for local ecosystems.

What are the consequences?

Firstly, dredging is likely to have a negative impact on birds nesting on the islands and on sturgeon populations, which migrate up and down the Bystroye Canal and are protected not only by Ukrainian, but also by international legislation.

Such interference in ecosystems can change coastal landscapes, with unpredictable consequences. The potential environmental impact has already been discussed in detail in a previous UWEC Work Group article.

According to UWEC Work Group expert **Eugene Simonov**, a specialist on

Fig. 6. A great egret (Ardea alba) flies above the Danube Delta Biosphere Reserve. Source: Maksim Yakovlev

river conservation, the creation of major shipping routes through the reserve is unacceptable. As he explains, the whole point of creating reserves is so that natural ecosystem processes can take place without human interference as far as possible – this is the essence of this form of nature conservation.

"The Danube reserve preserves the vibrant natural dynamics of a floodplain ecosystem, where multiple channels are constantly being born and dying," says Simonov. "This is the great advantage the Ukrainian part has over the Romanian one, which didn't come under protection until long after its development for shipping began. In the Romanian part, many of the channels have been straightened, deepened and equipped with engineering structures and reinforced banks."

"There is an opinion that lower water volumes in the Kiliya, another branch of the Danube that flows into Ukraine, is partly the result of the creation of transport routes in Romania. Some consider it a good thing that dredging the Bystroye Canal increases the flow through this water channel. However, the creation of deep-water channels only damaged the delta's natural value in Romania. We can confidently say that developing the Ukrainian part of the delta for shipping will gradually lead to a similar degradation and artificial redistribution of flow. This is one of the gravest interferences in a delta ecosystem, leading to changes in various environmental parameters: current speed, volume and distribution of sediment, etc.," explains Simonov.

UWEC has already written about possible changes in the composition of

benthic organisms, the most important food source for fish, including sturgeon. There is a high probability that deepening one branch will lead to the disappearance of many other smaller channels and a decrease in the level of floodplain water bodies. Large vessel traffic increases the erosion of banks and will make bank reinforcement a consequent "mandatory" violation of the protected ecosystem. In addition, it was also previously assumed that new ports would be created for ships in the delta. Ukraine adopted corresponding legislative changes to facilitate this in 2022. Yet the current trend in Europe is towards dismantling structures that obstruct natural processes in rivers so that the mobile river ecosystem can reproduce itself. Dredging new straits in the Danube Delta, argues Simonov, is a step in the opposite direction.

Read more about the influence of the russian full-scale invasion of Ukraine on the Danube River and the region:

- Should Ukraine continue building the Danube canal?
- Dniester River – Evolution of transboundary river basin management in the post-Soviet space

How effective is it to replenish the Danube's fish stocks?

Meanwhile, conservationists in Romania are silent. The Danube Delta Biosphere Reserve did not comment on the impact of dredging on the

Fig. 7. The WWF replenished stocks of sturgeon in October 2023. Source: WWF

Fig. 8-9. The process of marking fish with a special dye, a blue or yellow elastomer, injected under the skin. Source: WWF

ecosystem, and Romanian Minister of Environment, Waterб and Forests **Mircea Fechet** reported to the UWEC Work Group journalist that over the course of time "the situation has changed":

"When 20 years ago Ukraine began construction and deepening work in the

Fig. 10-11. Releasing sturgeon into the Solomonov branch of the Danube in the Danube Biosphere Reserve. Source: WWF

Danube Delta, the process was negotiated neither with us nor with other countries. Over these years the situation has changed," replied Fechet.

As far as is known, dredging work was carried out during the fall-winter period, when there were no young sturgeon in the river, so the process

Fig. 12. Water buffalo on Yermakov Island in the Danube Biosphere Reserve. Source: Zhanna Sribna

might not have affected them. The chief threats to sturgeon are dams upstream, which prevent all fish from reaching the spawning site, and poaching.

In the fall of 2023 the World Wide Fund for Nature's Ukrainian branch, WWF Ukraine, released 2,500 juvenile sterlet (Acipenser ruthenus) and Russian sturgeon (Acipenser gueldenstaedtii) into the Solomonov branch of the Danube as part of its latest effort to restock the Danube Biosphere Reserve with sturgeon. As both species are listed in the Red Book of Ukraine, this restocking also has the far-reaching strategic goal of contributing to the restoration of the Danube's sturgeon population.

At the sturgeon farm in Odesa where they were raised, each fish was marked by injecting a special dye – a blue or yellow elastomer – under the skin. This allows scientists to track sturgeon migration routes.

However, this kind of "rewilding" also faces criticism. According to Eugene Simonov, stocking the river with artificially farmed fry amounts to gross interference in the ecosystem, and he believes that such measures are ineffective.

"The Danube is a vast ecosystem, where the natural recovery of most fish species is entirely possible… at least as long as their habitat remains undegraded. For sturgeon, perhaps the main limiting factor after poaching is when spawning grounds are blocked by dams. No matter how many fry you release into a huge river, you still won't create a stable natural population if it has nowhere to reproduce. So no release of fish can compensate for the destruction of freshwater ecosystems," he explains.

The ongoing debate between conservationists and the shipping lobby will be resolved by the conclusion of a scientific investigation, which will reveal the actual impact of dredging and shipping on local ecosystems. Field research is vital, but is currently only possible to a limited extent, with analysis of inaccessible areas carried out using satellite images. However, monitoring continues nonetheless, and solutions will be found once Ukraine has won the war. •

Main image: The Danube Delta Transboundary Biosphere Reserve. Source: Zhanna Sribna

What does Russia's war in Ukraine mean for global biodiversity conservation efforts?

Margaret D. Williams

Note: First and foremost we recognize that Putin's war is decimating Ukraine's people, culture, and natural heritage. This article is not to place the Arctic region ahead of Ukraine in any manner. Rather, it is an additive piece of the picture needed to understand the ramifications of the destruction of relations between the West and Russia.

This article explores some of the environmental consequences of Russia's war in Ukraine that are being felt far beyond the battlefields. In the high latitudes of the Arctic, thirty years of collaboration between Russia and the West in the fields of biological research and monitoring – as well as environmental protection – contributed to understanding and conserving transboundary species and ecosystems. For the last two years, however, most international science programs (with the exception of space exploration)

have excluded Russian participation. In wildlife and climate-related studies, the severing of ties is hampering global efforts to track climate change and protect biodiversity.

Efforts to hold ground

In the immediate aftermath of Russia's barbaric attack on Ukraine, western governments appropriately ceased diplomatic relations with Russia and rushed to implement punitive sanctions on Russian oligarchs, businesses, and organizations. Indeed, the US and Europe were quick to sever communications with nearly all of their Russian government partners. In the days and weeks that followed Russia's invasion of Ukraine, a giant "whoosh" could be heard across the northern hemisphere as hundreds of Western businesses pulled up stakes and left in a hurry.

Over the previous decade, increasing tensions between the West and Russia had already created many operational challenges for western NGOs and scientific organizations working in Russia. New bureaucratic demands regularly required new contortions to move equipment or samples across borders. A number of conservationists, including employees of World Wildlife Fund (WWF) and Pacific Environment, were harassed and detained on flimsy charges. Nevertheless, these groups still found ways to operate and remained determined to continue collaborating with their Russian partners. Some NGOs such as WWF were even weathering the difficulties of "foreign agent" designations, treading with caution while trying to hold their ground. Russia's invasion of Ukraine, however, was a turning point and many international organizations decided it was time to go.

This recent exodus of western partners from Russia and the abrupt end of joint conservation and research programs are now taking a toll on science and conservation at a time on the planet when cooperation is needed more than ever.

The Arctic: A Legacy of Cooperation

Perhaps more than any other region of the world, the Arctic is a region where understanding marine ecosystems and wildlife has depended on collaboration between the West and Russia. As the Cold War came to an end, migratory marine species shared between Russia's eastern Arctic and the US, and between Russia's western Arctic and Europe – and their habitats – became the focus of many shared biological inquiries. In the "new" Russia of the 1990's, opportunities to communicate across previously impassable barriers led to the blossoming of hundreds of new partnerships, including long-term research and monitoring programs,

Fig 1. Chukchi Inupiat hunters exchange. Photo by M.Williams

both bilateral and multinational, across the Arctic.

One legal arrangement that accelerated such programs was the "Agreement on Cooperation in the Field of Environmental Protection" (first signed by the USSR in 1974 and upheld by the Russian Federation in 1992) The agreement provided a framework for 11 thematic areas of collaboration, from Air pollution (Area I) to "Earthquake prediction" (Area IX). Under the auspices of what became commonly known as "Area V," ("Preservation of nature and the organization of preserves"), enthusiastic leadership from American agencies, particularly the US Fish and Wildlife Service, catalyzed and sustained a high level of cooperation with their Russian counterparts.

Through Area V, ornithologists, marine mammal biologists, and park managers from each country were able to meet in person, conducting joint field research and wildlife surveys and sharing methods and trading information about the status of their respective species in their nations. Whereas the US-Russia maritime boundary had limited the geographical scope of research for 70 years, the 1990s allowed scientists from both sides to move beyond the boundary for the first time in generations. Finally, Russian and American biologists could

work together to describe the population status and migration patterns of polar bears, walruses, salmon, seabirds, shorebirds, sea lions, northern fur seals, and other wildlife.

Indigenous communities, too, were instrumental in adding to this holistic picture, for example, combining efforts across the Bering Strait to share observations and knowledge about bowhead whales. (Calculating an accurate number of whales in the bowhead whale population was critically important in order to establish the harvest quotas permitted for Indigenous communities in both nations). In 2010, a visit to Alaska by Indigenous Chukchi hunters enabled the visitors from Russia to share their observations of the formation of massive coastal walrus haul-outs, an emerging phenomenon in response to the early seasonal melting of Arctic sea ice. Together, this personal exchange with Inupiat hunters and the Chukchi hunters' stories about protecting walrus haul-outs from aviation activities, tourism, and other disturbances set in motion a similar response among Inupiat hunters when, four years later, 20,000 walruses hauled out on the shores of the village of Point Lay, Alaska.

New insights for conservation and science

By 2022, a strong foundation of science had been built upon thirty years of long and deep relationships between Russian and American biologists. Thanks to Area V and decades of cooperation among polar bear biologists and Indigenous observers, new knowledge of the Alaska-Chukotka polar bear population was possible, as were insights into how changes in Arctic sea ice was affecting these bears. Similar outcomes occurred related to many other marine species – walruses, seabirds, Steller's sea lions, and many more.

International expeditions involving Russian scientists also contributed to a greater understanding of climate impacts in the Arctic Ocean. One such program was the Distributed Biological Observatory (DBO), where multinational teams conducted annual sampling at fixed sites in the Bering Sea in order to detect climate-related changes and impacts on marine biodiversity. Russian researchers also participated in the Multidisciplinary Drifting Observatory for the Study of Arctic Climate (MosAIC), an ongoing study of climate impacts in the Arctic Ocean that involves participants from 20 nations who gather new data on Arctic biota and climate change. These programs, in turn, informed the global science and conservation communities who could incorporate the information into climate models and conservation strategies.

Arctic partnerships flourished not only through government programs.

Dozens of Western conservation groups also teamed up with Russian NGOs in joint efforts to protect nature, often utilizing the research produced by the bilateral science teams to inform conservation strategies. Examples include decades of communication between Indigenous communities, joint work under Area V, and various international studies that documented the Bering Strait's critical nature as a seasonal migratory super-highway for thousands of marine mammals and nesting habitat for millions of seabirds. In the face of increasing ship traffic through the strait, the Alaska conservation community collaborated with Russian partners to propose new shipping routes to streamline marine traffic and avoid sensitive and navigationally risky areas.

In another illustration of transboundary collaboration, an NGO coalition, known as the Clean Arctic Alliance, provided a forum for environmental groups across the Arctic (primarily from the US, Canada and Russia), to pursue shared goals related to ocean pollution and protection. The International Maritime Organization (IMO)'s passage of a ban on Heavy Fuel Oil in the Arctic in 2021 can be attributed to that coalition's successful advocacy and their ability to communicate with multiple delegations at the IMO, including Russia's representatives.

Another example of cooperation – this one between the American and Russian branches of WWF – helped to prevent the bycatch of tens of thousands of seabirds in the western Bering Sea longline fishery. Around the world, long-lines decimate seabirds by ensnaring and drowning them when the birds fly in to steal baitfish from line's hooks. When the problem of seabird bycatch had become intolerably high and risked pushing the rare Short-Tailed Albatross into extinction, relevant authorities threatened to shut down the Alaskan longline fishery in the event that the two-bird limit was reached as these birds become ensnared and killed. Facing the prospect of their fishery being closed, the fishermen worked with scientists to devise a simple yet highly effective method of preventing seabird bycatch.

WWF US was able to share the Alaskan experience by funding the involvement of a Russian ornithologist in first documenting the problem of seabird bycatch. WWF then introduced American fishermen to Kamchatka fishing captains to explain the economic benefits of these bird-saving devices. Using an economic assessment tool developed in New Zealand, WWF was able to demonstrate that just one Russian company was losing $100,000 per fishing season in lost bait and lost fishing opportunities. The combined personal outreach and connections between Russian and American seabird biologists and fishermen proved to be a winning formula. Russian longliners

US fishing captain talking to Kamchatka fishermen. Photo by Margaret D. Williams

were convinced of the value in adopting the use of the deterrents – known as "streamers" on their own vessels. Even after WWF's initial investment in the project ended, Kamchatka long line vessels continue to use the deterrents, thereby saving thousands, if not tens of thousands of seabirds annually.

Abrupt interruption in cooperation: What does it mean?

On 11 June 2022, the official release of the United States' Guidance on Science and Technological Cooperation with the Russian Federation signaled to many scientists that a new Cold War had rushed in and settled across the land like a chilly fog. While making allowances for existing projects to be "concluded", the White House statement was a glaring red light, making clear that no new collaborative projects could commence. Furthermore, the guidance stated that until "Russia ends its war against Ukraine, the United States government will seek to limit engagement with the Russian government in various international projects and initiatives related to science and technology, except where required by our obligations under international law."

It is important to note that the White House guidelines acknowledge that NGOs are not encumbered with these same restrictions: "Non-government institutions should make their own determinations regarding how to proceed with contact and collaboration between the

United States and Russian scientific communities, in furtherance of an open exchange of ideas within the international science and technology community." Nevertheless, many conservation groups decided to exit Russia, or were forced out by hostile designation of such organizations as "undesirable organizations."

That severing of the many bonds built over 30 years is felt deeply across science and nature protection communities. The lack of communication now means that western conservationists and scientists no longer have access to information about trends in wildlife and impacts of climate change on wildlife and ecosystems.

One area of Arctic research has the science community particularly worried: permafrost research. Russia contains 46% of the northern hemisphere's permafrost, the layer of frozen soil across the Arctic. Permafrost also contains high volumes of decomposing organic matter, which, when warmed as the permafrost thaws, releases methane. Permafrost contains 2.5 times more carbon than that which exists in the global atmosphere, and also has significant amounts of methane. In order to accurately calculate what is happening with our global climate systems, western scientists need to communicate with their Russian counterparts. And yet most bilateral communication is now impossible.

Bering Strait "super-highway"

One geographic area of particular concern in the current "chill" is the Bering Strait. This narrow waterway separates Russia from the United States by 58 miles of water, a passage that connects the North Pacific Ocean with the Arctic Ocean. If connectivity is an important ecological principle upheld as key to maintaining genetic diversity and species resilience, the Bering Strait is an essential place in all of the Arctic, and even the planet. This place is one of the most sensitive and critically important chokepoints for marine mammals in the Arctic (and globally). Each spring, over 15,000 bowhead whales swim through the strait, primarily under the ice, in pursuit of productive feeding grounds off the Alaskan coast, and then onward to Canadian waters. By fall, the bowheads linger just off Russia's Chukotka coast, before heading south through the Bering Strait.

While ship traffic was already on the rise in the last decade, since the war in Ukraine, the number of vessels transiting the Bering Strait increased by 40%, in large part due to closer Sino-Russia relations. The combination of a longer open water season and more vessels overlapping with the natural patterns of wildlife migrations represents a new and acute environmental threat to the Bering Strait. Cargo vessels, liquefied natural gas tankers, and other ships

are now moving through the Bering Strait at the same time the bowheads are migrating south to the Bering Sea. And now that the shipping season is possible in the dark months of fall, the use of deck lighting on vessels is likely to attract seabirds, which often become disoriented by the lights and frequently perish.

The Bering Strait offers a vivid example of how the halt in collaboration between US and Russian government agencies has exacerbated an existing environmental risk in that waterway. After years of developing a joint contingency plan in the event of an oil spill in the Bering Strait, members of the US Coast Guard and Russian Marine Rescue Service met in Anchorage, Alaska in September of 2021. During this collegial, professional exchange, senior leaders of these agencies made plans for an on-site oil spill response exercise in the spring of 2022. Both parties planned to bring their own response vessels and equipment and to engage US and Russian personnel in practice drills. Understandably, these exercises were canceled because of Russia's instigation of war in Ukraine. The Bering Strait is all the more vulnerable, and the region is ill-prepared for an accident when it happens.

The role of western funders cannot be ignored in considering the impacts of conservation in Russia over the last decades. Multi-millions of dollars were invested in Russia's protected areas, species protection, education, and research. Naturally, all government aid stopped flowing to Russia as sanctions went into effect. And most private donors ceased funding in Russia, in keeping with the sanctions but also because of the closure of the SWIFT banking system. Inside Russia, there are also obstacles to supporting science or conservation, as "Foreign Agent" laws make it illegal for Russian citizens to receive funding from foreign organizations.

Examples of the war's impacts on the Arctic are numerous. From polar bears to walruses, to salmon and seals, Arctic wildlife are mobile and constantly traversing political boundaries. Without an "Area V" forum or similar venue to bring Russian biologists together with their US or western counterparts, refreshing our knowledge of these species and their habitats at a time of rapid change will be highly difficult, if not impossible. But much worse for Arctic places, people, and wildlife is that the communities of individuals and organizations united for a common cause – Arctic science and conservation – are now isolated and unable to work together. Ambitious visions for science are now on hold. Ambitious goals for nature protection, such as those encompassed in the Global Biodiversity Framework, are unlikely to be fulfilled, in part because the agreement is inherently global and requires cooperation.

New forms of collaboration

Considering the dire trends in biodiversity loss, it is worth considering some approaches to preserve valuable information networks and conservation efforts. It is important that any step to engage Russian experts avoid a signal of legitimizing the Putin regime or endangering those western allies and former partners inside Russia, where a harshly repressive anti-western atmosphere is dominant.

One way this is possible is through contact with the many skilled Russian biologists and scientists who have fled their country's authoritarian regime. Western scientists could connect with these people and engage them in data analyses and expert assessments.

In the last two years, Western entities have effectively black-listed Russian participants from Arctic scientific conferences. Efforts could be made to open access to some Russian partners, especially young scientists who are eager for contacts with the West. Additionally, information sharing could be facilitated via publicly accessible databases, thereby skirting direct communication. If communication were to be considered, virtual, on-line webinars within academic circles could allow for some exchange of expertise. Utilizing the UN system as a broker for convening scientists may be considered, for example, through the United Nations Environment Program (UNEP) and the Fisheries and Agricultural Organization (FAO), both of which maintain offices in Moscow.

Finally, just two weeks ago, the Arctic Council issued new guidelines to allow for its Working Groups to resume meeting – for now, only via virtual formats. This development will certainly accelerate some communication between the West and Russian experts, though it remains to be seen whether substantive work will be catalyzed with Russian involvement.

Considering the relative independence the private donor community has within the US Guidelines on Scientific Cooperation, foundations could help by making some funds available for the above activities. Investment in supporting "diaspora Russians" with the skills and knowledge in science and conservation could go a long way in supporting the conservation and science communities during this crisis, and also ensure that, when it is possible for such people to return home to Russia, a foundation for partnerships will not have to re-built from scratch. Some universities are already taking this approach through the creation of Scholars At Risk programs that offer safe harbor for scientists and activists who have fled Russia.

Conclusion

The prevailing view of political analysts indicates that Russia's war

in Ukraine is deeply entrenched and there will be no "return to normal" any time in the foreseeable future. Western nations are unlikely to lift sanctions any time soon, and logistical and diplomatic obstacles will continue to prevent the flourishing of full-blown partnerships involving Russian experts. For the sake of wildlife and efforts to protect it – now a casualty of Putin's unjust war – conservationists and the science community must continue to seek interim approaches for lesser engagement with Russian counterparts that at the very least can serve as a band aid on the hemorrhaging of global biodiversity loss.

Margaret Williams is Senior Fellow, Arctic Initiative, Belfer Center for Science and International Affairs at the Harvard Kennedy School of Government. •

Main image source: Earth

Looking back on our 2023-2024 webinar series

Viktoria Hubareva

In 2023 and 2024, UWEC Work Group, together with Reporters without Borders Sweden and the Svea Green Foundation, conducted seven webinars for journalists on the environmental and climate impacts of Russia's invasion of Ukraine. Our experts were also invited to speak at virtual meetings hosted by other institutions.

In this overview, you will find more information about our webinars as well as links to all recordings. Additional information is also available on our website.

Webinar 1: What do we mean by environmental and climate impacts of the war in Ukraine?

"Half of Ukraine's scientific centers are under occupation or in ruins. The material base of universities and nature reserves has been seriously impacted. Many young scientists have left for the West and some of them will not return. But science goes on!"

Oleksiy Vasyliuk

The first webinar in our series examining the environmental and climate consequences of the Russian invasion of Ukraine, conducted jointly

with Reporters Without Borders, took place in May 2023. Among the issues covered during the webinar is wartime life in the scientific community.

UWEC experts Oleksiy Vasyliuk and Eugene Simonov discussed the direct and **indirect environmental and climate consequences of the war in Ukraine**, including chemical pollution, destruction of ecosystems and biodiversity, changes in national environmental and climate policies of Ukraine, Russia, and other countries in the world, and the impact of the war on international cooperation as it relates to environmental and climate protection, as well as the main scenarios and paths for Ukraine's "green" reconstruction when hostilities come to an end.

Webinar 2: Consequences of munitions use and chemical pollution stemming from military combat in Ukraine

"Everything that you see during an explosion immediately enters the atmosphere."

Oleksiy Vasyliuk

Oleksiy Vasyliuk, director of Ukrainian Nature Conservation Group and UWEC expert, told meeting participants about the "products" of using ammunition and chemical pollution during **military operations in Ukraine: military waste, heavy metals soil contamination, air pollution**. Oleksiy also spoke about **possibilities for restoring ecosystems after hostilities**.

Webinar 3: Environmental consequences of the Kakhovka Dam explosion

"Dams and dikes have been used as weapons of war since ancient times. Generals changed the path of rivers to flood enemy fortresses and troops or, conversely, deprive them of water."

Eugene Simonov

This webinar took place in June 2023, just over a week after the Russian terrorist attack on the Kakhovka hydropower plant and using data available at that time. It provided a comprehensive assessment and analysis of the consequences of the Kakhovka dam's destruction in southern Ukraine.

- UWEC experts Oleksiy Vasyliuk and Eugene Simonov shared their assessments of the catastrophe's consequences
- Bellona expert **Dmitry Gorchakov** gave his assessment of the effect of the dam's destruction on Zaporizhzhia Nuclear Power Plant, located on the former shores of the Kakhovka reservoir
- Ukrainian environmental journalist **Viktoria Hubareva** described how the dam's

destruction at Kakhovka Hydropower Plant was being covered in the Ukrainian media.

Webinar 4: Persecution of environmental activists in Russia and Belarus prior to and following the military invasion of Ukraine

"In 2022, at least 261 administrative citations were drawn up against environmental defenders. The citations show that activists were fined at least 2,479,000 rubles."

Marina Dubina

The fourth webinar described the persecution of environmental activists in Belarus and Russia before and after the outbreak of the full-scale war in Ukraine, as well as how the Russian military invasion influenced persecution of activists. Speakers included:

- **Marina Dubina**, Ecodom expert
- **Vitaliy Servetnik** of Environmental Crisis Group, an organization which, among other objectives, monitors rights violations and persecution of environmental activists in Russia.

Webinar 5: Gathering and analyzing data on the environmental consequences of Russia's invasion of Ukraine

"The probability of an accident at any single large dam in peacetime is relatively small. But this is more than offset by casualties and destruction in the event of an "unlikely" attack."

Eugene Simonov

Presenting experts spoke discussed gathering and verifying data on environmental damage:

- **Aleksandr Opanasenko,** Ukrainian community organization Ecoaction, spoke about Ecoaction's experience organizing documentation of environmental damage and environmental crimes, including the creation of interactive maps.
- **Wim Zwijnenburg**, Paxforpeace, spoke about the use of Open Source Intelligence (OSINT) techniques, remote-sensing technology, and Earth observation systems to analyze the war's environmental consequences.
- **Linas Svolkinas,** Conflict and Environment Observatory (CEOBS), spoke about remote data collection, verification of publicly available data, "gaps" in available information about environmental damage and the possibility of eliminating those gaps, as well as the peculiarities of the war in Ukraine in terms of damage to the environment environment.

Webinar 6: Green rebuilding of Ukraine

"To date, conversations about a green recovery have not included discussion of ecosystem restoration. This specific issue will be felt in other countries as consequences of the war."

Oleksiy Vasyliuk

By the end of 2023, Ukraine's information space surrounding the war began to shift. Whereas at the beginning of the full-scale invasion the conversation was mostly concerned with environmental consequences, today there is now more talk about a green recovery. The fifth webinar in the series was dedicated to this topic.

- **Oleksiy Vasyliuk,** director of the Ukrainian Nature Conservation Group and UWEC expert, spoke about the prospects for restoring Ukrainian ecosystems destroyed or damaged as a result of military operations and also highlighted potential environmental projects that could help restore the environment.
- **Torsten Wöllert,** a Brussels-based expert in environmental and energy-related issues serving on the European Commission's Ukraine Support Group spoke about rebuilding Ukraine's energy sector, including opportunities to develop renewable energy and international aid and initiatives.

Webinar 7: How to write about the environmental consequences of Russia's war in Ukraine

"Even far from the frontline, environmental journalists in Ukraine must consider factors related to martial law. For those wanting to conduct fieldwork, you must understand the many legal and practical nuances to be safe and get the best results."

Viktoria Hubareva

The last webinar in our series was dedicated to the work of journalists. During the conversation, presenters discussed collecting and verifying information about the environmental consequences of Russia's invasion of Ukraine, as well as the specifics for international journalists working in Ukraine.

- **Alexej Ovchinnikov,** UWEC editor in chief and member of Green Network, spoke about searching the internet for information about the environmental consequences of military operations, potential information sources, and verification methods.
- **Viktoria Hubareva,** Ukrainian environmental journalist, spoke about the specifics of working in environmental journalism in Ukraine during wartime.

In addition to our webinar series (with support from Reporters Without Borders (Sweden) and Svea Foundation), UWEC experts and journalists were also invited to participate in other webinars around the world, including one in Australia.

Natural Cost of War

"Ukraine has a small number of protected areas that occupy roughly 6.8% of the country's total land area. Of these, almost half – 44% – are either located in the occupation zone or have been damaged during hostilities. Unfortunately, this is true for Ukraine's most valuable nature conservation areas."

Oleksiy Vasyliuk

On 5 June 2023, celebrated as Environment Day, the University of New South Wales (Canberra, Australia) held a webinar entitled "Natural Cost of War". UWEC experts gave a series of presentations.

- **Anthony Burke**, an environmental philosopher known for his study of the formation of international environmental law and management institutions, moderated the webinar. He devoted his brief report to nuclear safety at civilian sites and the reform of international law.
- **Oleksiy Vasyliuk**, director of the Ukrainian Nature Conservation Group and UWEC expert, spoke about the challenges faced by Ukraine's nature reserves, national parks, and other protected areas.
- **Eugene Simonov**, UWEC expert and ecologist specializing in the conservation of freshwater ecosystems, environmental impacts of globalization, and the expansion of international cooperation between environmental NGOs, spoke about indirect environmental harm resulting from war.
- **Angelina Davydova**, UWEC expert and co-editor of UWEC, UN climate negotiations (UNFCCC) observer since 2008, member of the World Future Council, and co-host of the English-language podcast "Eurasian Climate Brief", spoke about the connection between the war and the global climate agenda.

Stay tuned in 2024 for new webinars studying the environmental consequences of Russia's invasion of Ukraine, the country's green recovery, the impacts of war on the environmental movement, and much more.

Follow us on social media: Twitter, Facebook, Telegram.