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“Russia’s Ecocide in Ukraine: Environmental Destruction and the Need for Accountability”***

Russia’s escalation of its war of aggression against Ukraine in February 2022 accelerated an ongoing environmental crisis first sparked by Moscow’s annexation of Ukraine’s Crimean peninsula and invasion into eastern Ukraine in 2014. Since my research and fieldwork on this armed conflict began in 2015, my work has traced multiple environmental devastations and risk scenarios that are linked to Moscow’s broader strategic goals of controlling and degrading Ukrainian sovereignty. Since Russia’s escalation in 2022, my data has mapped a broader pattern of escalating atrocities including through willfully induced environmental devastation. I am very concerned that we are now witnessing the full transition of Moscow’s intent to destroy or partially destroy the Ukrainian people, in part by inflicting environmental harm that reduces the Ukrainian peoples’ ability to live, to thrive, and to control their own democratic destinies in their homeland.

Moscow’s direct and indirect environmental devastation in Ukraine is a multifaceted and interconnected phenomenon. Confronting these complexities is fundamental to a robust U.S. national security strategy that degrades Moscow’s ability to wage a war of aggression and atrocities in Ukraine, as well as its growing global belligerence against the U.S. and U.S. allies. Environmental devastation is occurring across diverse natural arenas, through immediate and long-term impacts to health and economies, and through the targeting of humans and ecology with global implications.

First, arenas: Russia’s war has devastated Ukraine’s diverse natural landscapes—forests, woodlands, fields, grasslands, steppes, and waterways, including ground water, surface water, and collected bodies of water like ponds and streams. At least thirty percent of Ukraine has been contaminated with landmines and unexploded ordinance, an area equivalent to the state of Florida. Other war-related destruction, deforestation, and fires have harmed at least thirty percent of Ukraine’s protected areas. Ukraine is currently experiencing one of the world’s worst environmental disasters in terms of soil pollution per unit of time, given the very high-intensity kinetic warfare occurring in heavily urbanized areas. Toxic elements like lead, cadmium, arsenic, and mercury frequently leach from weapons, ammunition, and vehicles into soil. Particularly in eastern Ukraine, this warfare is also occurring in fragile sites of Soviet nuclear heritage. The risk of intentional or accidental contamination existed prior to 2022 but has dramatically increased.

In Ukraine and beyond, short and long-term health impacts abound, often exacerbated by the war’s environmental impacts. We measure health risks from toxic substances in part by examining dose and exposure: how long a community or individual was exposed to a hazard and at what intensity. Ukraine’s people are immediately in danger today due to Russia’s daily shelling and missile attacks, but they are also in danger today as they are exposed to more subtle

health dangers caused by environmental damage. Russia's horrific bombardments also cause long-term health impacts for Ukrainians, such as the release of asbestos and particulate matter into the air. Environmental health hazards disproportionately affect the vulnerable, including children and the elderly. Infant deaths caused by environment-induced respiratory illnesses have already been documented, even after such children have been taken to physically safer locations.

Ukraine's biodiversity and nature—so important to Ukrainian culture, communities, and mental health—is also under significant attack. From thousands of dolphins dying in the Black Sea to the intimate impact on household pets, Russia's outright violence and careless neglect have devastated millions of animals, birds, fish, and other wildlife. Nicknamed the Ukrainian Serengeti, Ukraine's Askania-Nova biosphere is the world's oldest steppe reserve, home to wild zebras, buffaloes, and wildebeests. It is now also under Russian occupation, and like the rest of Ukraine, fighting for its survival. Russia has killed thousands of Ukrainian civilians and driven millions from their homes, sparking the largest refugee crisis in Europe since World War II. It has also killed, wounded, and driven millions of wildlife from their habitats, with long-term impacts on European biodiversity.

Each of these statistics will grow worse and prove more challenging to remedy with every day that Moscow continues inflicting such harm in the context of an unprovoked war of aggression with a significant degree of impunity. Moscow's real or perceived impunity in inflicting environmental disaster on Europe's largest country has significant global implications, particularly for international food security, energy security, and air and water pollution.

The Russian military's environmental damage to Ukraine's famed black soil and farmlands has included intentional devastation through landmines and flooding, second-order pollution impacts, and the disruption of Ukraine's preexisting robust and impressive environmental management activities. In 2022, the World Food Programme assessed that 50 million people in 45 countries were teetering on the edge of famine, a dynamic significantly worsened by the environmental impacts of Russia's war on Ukraine. Despite Ukraine's notable Black Sea military victories that have enabled greater shipping of food, Russia's war will have long-term agricultural impacts on Ukraine as a key producer of essential global goods.

In parallel, the significant risks of direct or indirect devastation caused by Moscow's occupation of the Zaporizhzhia Nuclear Power Plant and military action around Ukraine's 15 nuclear reactors, chemical plants, mines, or other manufacturing facilities has the potential to spread environmental devastation well beyond Ukraine's sovereign territory. For the reasons of these data points and many others, it is not an exaggeration to say that Russia has become one of the world's largest orchestrators of civilian suffering.

In the context of Moscow's environmental devastation, it is incorrect to view the environment solely as collateral damage. In fact, the most credible assessments of Russian perpetrator tactics and strategy must also include their willfully inflicted environmental damage. More than second order impacts, environmental harm and the broader human rights questions they fit into are speaking loudly to us about Putin's true intentions in Ukraine.

Russia's crimes in Ukraine are astronomical and challenge even the most dedicated experts to keep up. Around the two-year anniversary mark of Russia's full-scale invasion, the United Nations had documented nearly 1,700 attacks on Ukraine's healthcare system, the devastation of which was brought home to us all by Russia's bombing of Ukraine's biggest, best children's hospital in Kyiv last week. But Kyiv prosecutors have also recorded more than 2,400 environmental crimes in Ukraine, suggesting that Russian perpetrators are targeting Ukrainian lives and the world around them in an interconnected strategy.

Environmental damage has become a Russian weapon in its own right. Russian perpetrators' total disregard for human lives and the environment was laid bare by last year's explosions around large sections of the Nova Kakhovka dam and hydroelectric power plant in southern Ukraine—a humanitarian disaster Russian soldiers worked hard to worsen in the following days, including by shooting at rescuers. As this disaster unfolded across global televisions, its indescribable impact on ecology was named the worst environmental disaster in Europe since Chernobyl. Chernobyl, caused by Soviet negligence in Ukraine in 1986, is a strong historical hint of Moscow's disregard for the people it claimed in its imperial orbit. Today, the cycle of impunity for Moscow's violent imperialism, including for environmental devastation, must be broken.

Today, loud global calls to stop unfolding ecocide and prosecute Russia for the Kakhovka dam explosion and other environmental crimes are growing louder. Article 441 of the Ukrainian Criminal Code stipulates the “ecocide” is the “mass destruction of flora and fauna, poisoning of air or water resources, and also any other actions that may cause an environmental disaster.” Many options exist to support our Ukrainian partners in their pursuit of justice and accountability, and the world will look to American leadership to prevent Russia's weaponization of the environment as the new normal.

In the context of Russia's broader atrocities machine rampaging through Ukraine every day, Russia's environmental weaponization is part of their larger strategy to destroy or partially destroy Ukraine for daring to be free. Several days ago, Russia's Foreign Ministry spokesperson made not-so subtly veiled threats against the Kyiv hydroelectric power plant and the Kaniv reservoir, as they also did in the months leading up to the Kakhovka dam explosion. Such environmental threats willfully inflict severe mental and physical harm on the Ukrainian population as part of its larger destructive strategy.

Russian perpetrators are justly under scrutiny for a multitude of international crimes. From scorched earth to drowned earth to aiming to destroy Ukraine's power grid and let winter do its deadly work to an unprotected population, Russia aims to destroy the beautiful lives and beautiful lands that Ukraine has cultivated. The rising tide of an authoritarian axis is exemplified by Russia's weaponization of the environment to kill, maim, and terrorize Ukrainians. History is watching U.S. leadership to see if this environmental terrorism will be prevented, deterred, and punished.