Our Own Scorched Earth: Climate Change and the Post-Human Ecology of the Chernobyl Exclusion Zone

In military doctrine, a scorched earth policy refers to the strategic destruction of every potentially useful resource on enemy land. During a push through enemy territory, everything that might be used against them is indiscriminately burned, leaving nothing behind. Shockingly, ever since the dawn of the industrial revolution, it seems that humanity has been dedicated to enacting its own version of a scorched earth policy on the entire world: the steady march of human caused, or anthropogenic, climate change now threatens the global ecology in unprecedented ways. Human populations have ballooned, industry has skyrocketed, and meanwhile, the global temperature difference from the 1900-1960 average (a common method for determining the extent of climate change) is projected to increase exponentially in the coming years, with most measures estimating a 2.0°C difference by 2050 (NOAA.gov). This much of a change would be, in short, disastrous: The effects such a change would have on the ecosystems that make up the diverse web of living things that cover the planet would be immense—changes on any scale to the climate of a region can cause shifts in the food chain, impact the distribution of important species like pollinators, and lead to mass extinctions. These consequences wildly impact the biodiversity, or variety of species, within the region, a metric often used to determine overall ecological health. When looking for solutions to a problem, especially one with such a wide scope, it’s often best to focus on the root cause of the issue. In this case, the cause is obvious: humanity. The solution is less so, and hotly debated by scientists and politicians alike. An unconventional, yet potentially critical solution, could be just as simple as the cause— the removal of humans from an area. While large-scale abandonment of land is uncommon and extreme, it has been done before in response to disasters that make an area unliveable for humans in the long term—specifically, in the area surrounding the former Chernobyl Nuclear Power Plant, which has remained uninhabited for nearly forty years. The recovery of land from humans has allowed native species to recover, and even flourish, after the accident. The post-human ecosystem of the Chernobyl Exclusion Zone demonstrates the need to de-emphasize the role of humans in conservation and preservation and to instead focus on reducing all anthropogenic effects on the global ecology.

On the 26th of April, 1986, a failed test of the backup power systems of the Chernobyl Nuclear Power Plant ("NPP") led to the largest release of nuclear contaminants in human history. The test involved intentionally slowing the activity of the reactor, followed by a simulated blackout—unfortunately, due to a combination of user error and unexpected requests from the nearby power station, the reactor was operated at a reduced capacity for longer than anticipated. This, in combination with existing flaws in the reactor design, led to disaster: two explosions, so intense that "[the reactor operators] thought there had been an earthquake. It took them a while to realize that it was a man-made earthquake—one that they themselves had produced" (Plokhy 73). These explosions, and following release of radionuclides, led to an estimated 200,000 people being evacuated from the surrounding area and the establishment of a 2,600km^2 exclusion zone around the former reactor. In short, it was an apocalypse: two cities and their surrounding areas were rendered unlivable, over thirty people were killed, and most of Europe was exposed to dangerous levels of radiation.

Since the Chernobyl disaster, a new, global apocalypse has become a household topic: climate change. Unlike the Chernobyl disaster, there were no explosions or bright rays of Cherenkov radiation to herald the beginning of the climate apocalypse. Because of this, the response to climate change has been considered by many to be half-baked at best—and the science supports that belief:

> "If all 2030 nationally determined contributions are fully implemented, warming of 2.4 °C (1.9 °C to 3.0 °C) is expected by 2100. Meeting all long-term pledges and targets could reduce this to 2.1 °C (1.7 °C to 2.6 °C). Even these optimistic assumptions lead to dangerous Earth system trajectories" (Kemp et al. 2).

Scientists theorize that if more is not done, even if all existing goals are met, the anthropogenic damage to the climate could cause "a 'tipping cascade' in which multiple tipping elements interact in such a way that tipping one threshold increases the likelihood of tipping another" (Kemp et al. 2). Ecologically, such a cascade would lead to changes in wildlife distribution, the timing of natural life cycles, and ecosystem interactions (EPA.gov). For humans, the shifting climate would decimate the ecosystems that contribute $125-$145 trillion USD to the global economy, harm agriculture, and impact communities which depend on the environment. (EPA.gov). The danger of climate change cannot be overstated, especially because of humanity's dependence on the climate—as Naomi Klein writes, "We aren't losing the earth, but the earth is getting so hot so fast that it's on a trajectory to lose a great many of us" (252).

During the minor apocalypse of the Chernobyl disaster, a previously unheard of amount of radionuclides and radioactive material were released into the atmosphere. The surrounding area was highly contaminated, leading to short and long term consequences for the ecology of the area. In the short term, the release led to the creation of the colloquially named Red Forest, a pine forest which turned orange after every needle and tree died near instantly (Steinhauser et al. 807-808). While plants were affected more in the short term, the long-term consequences affected animal populations more acutely, especially bird populations. Small birds, namely barn swallows, “have shown significant relationships between background level of radiation and the timing of reproduction, clutch size and hatching success” in the years following the disaster (Møller and Mousseau 202-203). Additionally, the rate of mutations in native populations increased sharply after the accident, leading to more precarious population sizes. Despite the adverse effects of radiation, one key change had a positive effect on the biodiversity of the region: the absence of humans. In ecology, rewilding refers to the process of allowing nature to reclaim an area. The Chernobyl Exclusion Zone represents a unique example of “passive” rewilding, or rewilding done without human intervention—a “hands off” approach to restoration. Due to the lack of human presence, land that was previously used as farmland was given the chance to overgrow and return to wetland. This “increase in waterlogged areas saw wetland specialists increase in abundance, including two species locally extinct from the area before the accident: Greater Spotted Eagle (Endangered in Europe) and White-tailed Eagle,” a clear indicator of a recovering local ecosystem (Dombrovski et al. 1). Additionally, research suggests that even within the most contaminated areas, there is no evidence to suggest that species distribution has been affected—even if the numbers themselves have been (Webster et al. 188-189). While the Chernobyl disaster was catastrophic, the abandonment of the area has allowed for nature to recover, both from the disaster and from the previous human occupation.

Passive rewilding is, by and large, an unpopular practice: despite the negligible cost, the process eats into land that could be used for more economically advantageous purposes. While the intentional preservation and conservation of wild land has become relatively commonplace, the idea of returning developed land to its natural state is still considered radical—the idea of passive rewilding, without ecological management, is considered even more radical. Despite being considered more moderate, human managed conservation and preservation efforts have had adverse effects on some areas: by attempting to maintain the existing status quo, “long-term efforts to suppress and control disturbances have likely eroded the resilience of ecosystems and their ability to adapt to the new conditions that lay ahead with climate change and further growth of humanity,” an outcome antithetical to the goal of preventing further ecological damage (Moore and Schindler 4). Additionally, static protected areas lack futureproofing—climate change provides a strong “push” factor for species seeking ideal habitats, and “species may move away from static protected areas, and the composition of protected habitats will turn over as climate imposes new conditions on the landscape” (Moore and Schindler 4). A proposed solution to the radical elements of passive rewilding and the overly conservative elements of preservation is the idea of dynamic management—wilderness management that responds to the movement and behavior of fauna, rather than attempting to limit said behavior (Moore and Schindler 5). This practice could act as an important stopgap between current and future practices, allowing for solutions to be developed that could make large scale land abandonment more economical and appealing to governments. While passive rewilding will almost certainly be important in the long run, human behavior must still be taken into account—humans are, after all, the causes of climate change and the Chernobyl disaster.

In the wake of the climate apocalypse, the best course of action humanity can take is a hands off approach to the global ecology: by allowing the wild to recover passively, humans would be able to focus their attention on negating the negative effects they introduce, rather than playing catch up with their own destruction. In 1977, scorched earth policies were outlawed under the Geneva Conventions, prohibiting the destruction of resources that were important to civilian life. Since then, the average global temperature has risen 1.26°C, over half of the way to what is largely considered to be the point of no return for climate change. Science suggests that humanity has a deadline—one that is being rapidly approached—and that any solution to the problem of climate change will likely be unconventional, expensive, and radical. Since the Chernobyl disaster in 1986, there has only been one other nuclear meltdown of comparable scale: the Fukushima NPP meltdown of 2011, which released just under a tenth of the radioactive material of Chernobyl, and led to no deaths. Advances in nuclear science and safety have prevented any more minor apocalypses from occurring, but the threat of climate change is all encompassing: there will be no second chance to save Earth, no scientists to repair the damage that has been done except for those that are alive now and in the very near future. Even so, one day, when humanity is dead and gone and the Earth is nearly barren, all likelihood points to the idea that something living will take our place—whether it is through our actions or lack thereof, the wild will retake the globe.

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