

Stray puppies play in an abandoned, partly finished cooling tower inside Chernobyl's exclusion zone.

Canines formed pack families in the ruins of the nuclear accident.

SURVIVORS

Dogs of Chernobyl

After the meltdown of the nuclear reactor in 1986, people evacuated, but pups stayed behind. Here's what happened next. By Heidi Hutner and Erica Cirino

Andriivka, Chernobyl, Kopachi, Poliske, Pripjat, Tarasy, Velyki Klishchi, Vilcha, Yaniv. These are modern ghost towns created by the same nuclear disaster. Once lively northern Ukrainian municipalities that housed farmers, artisans and employees of the Chernobyl nuclear power plant, they were deserted following a catastrophic accident that happened at the nuclear plant on April 26, 1986. The trouble started when a power surge occurred during a routine safety test, sparking two enormous explosions in the plant's No. 4 nuclear reactor. The explosions were strong enough to blow the reactor's 1,000-pound roof off, allowing massive amounts of radiation—the equivalent of 400 Hiroshima bombs—to leak into the air, water and soil, and into plants, animals and people, as well.



This aerial shot shows Chernobyl's nuclear reactors with canals in the spring.

“liquidators” were ordered to shoot and kill evacuees’ pets (and many wild animals) in a bid to prevent the spread of radiation. They buried the bodies in enormous heaps beneath contaminated soil.

The dramatization of the killing of the dogs in the 2019 HBO series *Chernobyl* shocked viewers. Craig

“Man’s plight makes you sad but the plight of the animals is even worse.”
—Svetlana Alexievich, *Chernobyl Prayer*

While it was clear inside the smoldering Chernobyl nuclear power station that an accident had occurred, the rest of the world was kept in the dark. Ukrainian officials evacuated Pripjat within 36 hours, but it was a full two days later that workers at a nuclear power station nearly 700 miles away in Sweden rang the international alarm bell. They’d detected radiation on their clothing that didn’t come from their power plant; it had come from Chernobyl. Dire news of the disaster prompted officials to draw a 30-kilometer radius around the plant referred to as the “Exclusion Zone.” People living inside had to drop their belongings and leave their contaminated homes forever.

The fate of the animals inside that contaminated area is far more complicated. As the people cleared out, government officials called

Mazin, the series creator, tweeted, “I know that was hard [to watch]. Just so there’s no confusion—the story of the liquidators is real. It happened. And we actually toned it down....”

But the liquidators didn’t completely wipe out Chernobyl’s dogs. The survivors, maybe as few as a handful of dogs, forged out tedious lives on the Exclusion Zone’s emptied streets. Many dogs didn’t survive puppyhood, due to disease and winter starvation, but others formed packs and scavenged for resources like food and water.

At the same time, thousands of soldiers were recruited to reduce some radiation in the Zone by removing and burying contaminated materials, like soil. They also worked to ensure Ukrainians obeyed the restrictions on entering the contaminated area.



This stray dog stands at the monument by the new, giant enclosure that covers the devastated reactor at Chernobyl.

Despite this, a few people refused to leave the Zone in 1986, and through the 1990s, several hundred more returned to continue lives left behind. The returnees were called “samosely” or “self-settlers.”

A LIFE ON THE EDGE

By 1999, an estimated 612 samosely were living in Chernobyl illegally with perhaps the same number of dogs. It’s not clear how many dogs the liquidators killed, but samosely are thought to have cared for at least some of the handful that evaded the post-disaster killings. For the dogs, who were barely hanging on, forming cautious alliances with these people meant getting leftovers and a better shot at survival.

After a few years, the original human returnees were joined by thousands of workers who spend their days in Chernobyl removing contaminated materials, mostly soil, and constructing a new concrete building to encase the dangerous old reactor and prevent more radiation from leaking out.

By 2010, the Exclusion Zone saw an influx of even more workers recruited for cleanup and the construction of a new confinement structure. These power station employees have formed a special bond with the dogs, says Jennifer Betz, a volunteer veterinarian tending to Chernobyl’s dogs. It’s common to see Chernobyl workers splitting their lunch sandwich with a favorite feral hound.

Despite the power plant workers’ hospitality, the dogs still lived life on the edge. Disease and hunger persisted. And while hundreds of new pups were born each year, just half of them survived.

Today, tens of thousands of tourists arrive annually in increasing numbers, drawn in by Chernobyl’s radioactive legacy and the lure of disaster porn. Thanks in



Animal advocates cuddle with puppies at a makeshift vet clinic operated by The Dogs of Chernobyl initiative.

part to the popularity of the HBO series on Chernobyl, Kiev's tourism and promotion department has reported it expects 100,000 visitors to Chernobyl this year.

Ukrainian officials, ready to capitalize off a return of humans to the formerly abandoned Zone, were, naturally, concerned about rabies among the 1,000 unvaccinated dogs. Though the evacuated area covers about 2,600 square kilometers, dogs are not widely dispersed. Instead, they concentrate where humans live:

A few hang around samosely dwellings, more than 100 can be found at the Chernobyl nuclear plant site and many more have spread throughout the city of Chernobyl, where most of the Zone's population is concentrated right now.

SAVE THE DOGS

In 2017, more than three decades after the meltdown, volunteers began to arrive to help the

approximately 1,000 dogs living in the Zone. "They've been breeding and breeding for 30 years," says veterinarian Betz. Coming into the Zone with a crew of volunteer vets, vet techs and people affiliated with an American nonprofit group called Clean Futures Fund, she began providing much-needed canine medical care. This includes first aid, spaying or neutering, vaccination and deworming to protect against parasites.

"Our main goal is to provide a better life for the dogs," says

Betz, who has donated her time caring for street dogs all over the world. "Many die from disease and starvation in winter. We couldn't bring them out of the Zone, so we came here to treat them."

It remains challenging work. Getting a hold of the dogs isn't easy; you can't trap them like other street dogs. "They're too smart," Betz says. The friendliest young puppies can often be scooped up by hand, but adult dogs must often be blow-darted with a sedative cocktail. After that, sterilization

surgery commences, vaccines and deworming medications are administered, a radiation-reading dosimeter is clipped onto the ear, and the dog is released back on the streets exactly where it was found. Like all feral dogs, the Chernobyl canines don't mix well with dogs from other packs, so it's important the release location is precise to prevent skirmishes.

to healthier and longer lives for the dogs. Controlling for potential rabies outbreaks has also led to an improvement in public health. "Ukraine gets its rabies vaccines for humans from Russia, but because of the war they haven't received an adequate supply in years," says Hixson. "This means a person potentially exposed to rabies will have to travel at least three to four

Despite commonly mooching from humans for food, Chernobyl's dogs are anything but tame.

A very small number of Chernobyl puppies have been adopted out to individuals within the Ukraine and in North America. Yurislav, aka "Yuri," is one of these adopted Chernobyl dogs. "He is very well tempered, house trained, knows several tricks and commands, and is great with children," says Tim Mollohan, Yuri's adopter. Mollohan is an American nuclear professional from Grovetown, Georgia, who oversaw the containment of spent fuel at Chernobyl's nuclear power station from 2017 to 2018. There, Mollohan says, he became a friend to many of Chernobyl's street dogs. And he was working in the highly contaminated region when he got the chance to adopt one of these dogs and bring him back to the

U.S. after his work at the power station was complete. He says he wasn't worried about radiation. "I am familiar with radioactive contamination and how it passes through the body. I trusted the Clean Futures Fund team and their decontamination abilities," he says. "I knew my family would be safe and little Yuri had not been exposed long enough to significant levels of radiation."

According to Lucas Hixson, Clean Futures Fund co-founder, efforts by his group and others have led

hours to find a vaccine."

Today, thanks to sterilization, fewer dogs are born, and those alive have easier lives than the pets who escaped the liquidators decades before.

A BOON TO SCIENCE

While it's clear the volunteers' project is increasing the Chernobyl dogs' well-being, it has come with an unexpected scientific benefit. Scientists are able to study the dogs while treating them, drawing blood, saliva, hair and fecal samples and bringing them back to the lab. Researchers are using the opportunity to answer two fundamental questions about the Chernobyl dogs, says Tim Mousseau, an evolutionary biologist at the University of South Carolina: "Who are they, and what can they tell us?"

Some of these answers already seem clear. The dogs, who live just two to four years due to a hard life on the street, share a similar look that is different than the more diverse array of pet dogs found in surrounding villages: They are often robust and shepherd-like with large and erect ears, ranging between 45 and 65 pounds, with either short or long hair.

Ark of Survivors

Dogs weren't the only species to survive the worst nuclear meltdown of all time. Among other survivors, you can find bears, bison, deer, moose and many bird species. To document the comeback, a study from 2015 revealed abundant wildlife, including gray wolves, in the 1,000-square-mile ecological

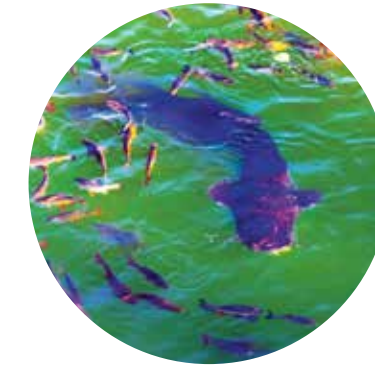
zone. More recently, in 2019, researchers from Georgia planted fish carcasses as bait and then set up cameras to see which species could be observed. According to James Beasley, associate professor at the Savannah River Ecology Laboratory and the Warnell School of Forestry and Natural

Resources and one of the researchers, the team saw 10 mammalian species and five species of birds. The results, published in the journal *Food Webs*, found that nutrients from bodies of water, especially rivers, can flow into damaged land regions, feeding species there on the ground. The Georgia

researchers found that scavengers consumed 98 percent of the fish carcasses in a week. Species identified in the study include three types of mouse, the least weasel, American mink, Eurasian otter, pine marten, red fox, Eurasian jay, common magpie, raven, tawny owl and the white-tailed eagle.

The horses at Chernobyl still face many threats in the form of poachers.

Wild horses live and thrive in the fields irradiated by the meltdown at Chernobyl.



Large catfish live in the cooling ponds at Chernobyl, but scientists say their surprising size is not the result of mutation.

And though they've been getting generous handouts from the samosely, workers and tourists, most of the dogs are rather feral, scurrying away when humans approach.

Their survival strategy has left them "rather plump, as far as street dogs go," Betz says. She and the other volunteers have not yet observed evidence of physical mutations linked to radiation like tumors, cataracts and smaller brains, all seen in other animals, such as birds, in heavily radiated areas like the nearby Red Forest.

Mousseau says DNA analyses of hundreds of their blood samples are underway, done in collaboration with geneticist Elaine Ostrander at the National Institutes of Health. Mousseau and Ostrander are now trying to prove that the dogs roaming around the long defunct, but still dangerous, Chernobyl nuclear power station are descendants of the disaster's original canine survivors.

If scientists can trace the dogs' lineage back to this small founder group, it would open up the first-ever opportunity for scientists to study the long-term health effects of initial exposure to high-level,



DID YOU KNOW? Thirty years after the devastation at Chernobyl, the red fox maintains a home in the area. It is one of 14 mammalian species observed often enough by scientists to be considered part of a robust, reproducing population.

and now low-level, radiation on a genetically uniform mammalian population, Mousseau states.

"This would mean we can examine questions of adaptation and evolution that wouldn't be possible if there was gene-flow coming in from other areas," says Mousseau. "If these dogs are descendants,

we're looking at a small and isolated population and this gives us more insight into their evolution and adaptation to a stressful environment." The generational genetic-level effects of radiation exposure are much more challenging to study in outbred populations, like humans, he adds.

A BETTER FUTURE

Most of the radiation from the Chernobyl blast settled over more than 160,000 square kilometers across Belarus, the Russian Federation and Ukraine, with lower levels of fallout spreading across Europe. The Nuclear Energy Agency reported 31 fatalities shortly following the disaster, with other estimates of tens of thousands of latent deaths over the years.

Radiation levels throughout Chernobyl and its surrounding areas are quite variable, with some regions, such as the Red Forest, clocking in very high dose rates—despite the disaster having had occurred 33 years ago. "This contamination is found throughout the environment so animals are still exposed to radiation through the soil, water and air, as well as the plants and animals they eat," says James Beasley, an ecologist at the University of Georgia who studies wildlife in the Exclusion

Zone. "Because of this, many animals continue to accumulate very high levels of contamination within their body tissues," he says.

Beasley adds the underlying effects of chronic low-dose radiation exposure are not fully understood for most species. This could lead to subtle, sublethal effects on the body, such as cellular damage, he posits.

So far, most dogs' dosimeters reveal exposure to low levels of radiation, Betz says. However, she and Mousseau plan another collection of dosimeter readings in Chernobyl to look for any patterns or clues as to what a "normal" radiation dose is for a Chernobyl dog. If scientists find that the genomes of the Chernobyl dogs are unusual, this could help them understand if genes mutated by radiation exposure can be passed down or might even build up over generations.

While many questions remain, scientists are optimistic they'll soon get answers. Thanks to the care of the samosely, veterinary volunteers and adopters, the Chernobyl dogs are now living longer and healthier lives. And with the help of science, these unwitting canine Chernobyl survivors may help uncover new knowledge about radiation exposures and genetics in a nuclear disaster zone that could have profound implications for future generations.

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