Nuclear power and systemic harm to animals and nature; the international picture
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It is great to be back here — definitely not as cold as last time in 2013! Joan and Mike will remember that visit when we were dressed up like Ernest Shackleton walking along Sizewell beach!

Birds have been my passion since childhood, so I am especially happy to be speaking in support of their protection.

And what a delight it is to be back in the company of Simon Barnes. A little known fact is that we were both on the tennis beat years ago. Life takes some interesting turns but how extraordinary that it is this that has caused our paths to cross again.

I have been thinking about the response to the corona virus and it seems eerily similar to our failure to respond adequately and it time to climate change. Recognizing an looming problem, going into denial, carrying on as normal and then trying to respond when it is too late and already a crisis. That's why we have climate change and why we have a covid-19 pandemic. And thinking about climate change we know we will see sea level rises and increased and more powerful storm surges. We know the history of this coastline. So we can be fairly sure it will be under water. Why then would you build a dangerous nuclear power plant with its lethal inventory of waste on Sizewell beach? It's a form of insanity.

And then with the corona virus — sadly it is unlikely to be an isolated event and we could see more of these. But you cannot call your workforce home from a nuclear power plant. You can walk away from wind turbines and they will keep spinning. You can walk away from a solar array and they will still collect solar energy. But you cannot call your workforce home from a nuclear plant. So to build the kind of technology that is lethal if abandoned is also a form of insanity.

And the third point is EDF and the EPR Areva reactor design. EDF wants Sizewell to save its nuclear business. It can only do it with your money. And they may even walk away, having collected your money. They will raze Coronation Wood to make a show of moving forward but that's all that matters to them. To preserve the French nuclear reputation. Because it has been stated publicly that they need Hinkley and Sizewell otherwise the French nuclear industry is finished. So you are the guinea pigs who will pay the cost, take the risks and maybe never see any of the so-called benefits.

So back to animals:

As you've just heard from Ben and Rachel and Simon, there are very real and specific risks to the flora and fauna of this region if Sizewell C is built — or, more accurately, commenced, because there is absolutely no guarantee it will be completed. We've

already seen a nuclear plant get abandoned half built in the US. And it was the local consumers who paid for that unfinished abandoned nuclear plant. Just as you will here, under RAB.

The Royal Society for the Protection of Birds has said it has concerns that “EDF energy may not be able to keep its environmental promises.”

I’d assert that the RSPB — and all of you — can be 100 per cent certain that EDF will NOT keep its environmental promises or any other kind for that matter.

This is because the track record not only of EDF, but of all nuclear companies involved in any stage of the nuclear fuel chain, is one of wanton environmental destruction and disregard for the well being and survival of animals, both wild and domestic.

We’ve documented this in our new booklet — *Nuclear power and harm to animals, wild and domestic.* The booklet covers the caribou of Nunavuk to the desert tortoise of Nevada, Fukushima’s monkeys to Fermi’s snake, to Florida’s sea turtles and more. So it gives you the global picture.

It’s no coincidence that Sizewell, and more particularly Minsmere — are featured in our booklet. So are the terns of Wylfa in Wales and the sea life that will be destroyed at Hinkley in Somerset. The natural beauty of the right now not-so-United-Kingdom is a precious part of our heritage and a very fragile one too, thanks to human activities.

So today I’ll be looking just at new nuclear power plants and what you can expect to see happen here in Suffolk, based on a systemic and historic pattern of behavior by the nuclear industry here and around the world.

The first thing to note is that we are now looking at this problem with the compounding challenge of the climate crisis. This means that whatever its impact, the nuclear industry can no longer claim as it always has, that it’s damage is minor compared to other industries.

Under the climate crisis we are already experiencing rapid extinctions and huge species and habitat losses. So any avoidable and unnecessary loss of songbirds, of bees, of frogs, of microbes, could now push those species over a tipping point, precipitating a cascade of collapses among other species, eventually including our own. So the building of a new nuclear power plant must be evaluated as a cumulative — not isolated — impact.

In anticipating the damage to wildlife and nature due to nuclear power plant construction and operation, we need only look at what has already happened.

I am based in the US, so I am most familiar with the situation there and have now authored two publications on the subject — the booklet I brought here and an earlier

study entitled *Licensed to Kill: How the nuclear power industry destroys endangered marine wildlife and ocean habitat to save money.*

And “to save money” is really what is at play here. EDF does not want the added expense of needed protective measures that would safeguard animals and nature. And in fact, it can’t do it, because nuclear power is inherently damaging to our environment.

In our *Licensed to Kill* report we looked at many examples. And in each case, the nuclear industry did everything in its power to avoid, bend, weaken or ignore regulations that protect wildlife and their habitat.

One case study was a coastal reactor in Florida that is still routinely capturing, harming and sometimes killing endangered and threatened species of sea turtles via its cooling water intake system.

This has been going on for decades. And the nuclear company that owns the plant has successfully avoided any culpability or penalty.

Why has it refused to prevent this harm? Because to do so would cost money. And because the costs of nuclear power are so high — and the reason is the safety measures needed, because the technology is so fundamentally and inherently dangerous — the nuclear industry argues its way to a do nothing outcome.

In our case — and probably here in the UK too — the regulator is firmly in bed with the industry and the marine protection agency simply buckles. Even though the nuclear plant has a “take” allowance — a maximum number of animals of any one species that can be captured, harmed or killed —the nuclear industry pushes for an increased allowance — and gets one — when they exceed those numbers. And this is regardless of the status and wellbeing of the species.

When it comes to fish, we found that unlike the heavily regulated fishing industry, nuclear plants can suck billions of fish and spawn into the plant system, where they are pulverized and later discharged with the artificially warmed water. All with complete impunity. No license needed.

This is what is going to happen at Hinkley C, which threatens to kill up to 250,000 fish a day, as it draws in 130,000 liters (34, 342 gallons) of water a second. Fish caught on entrapment screens will be returned to the sea, dead or alive. There will be zero accountability.

Why so many? Because in order to efficiently cool the plant, the water must be drawn in at force and speed and volume.

Why won’t they lower the intake speed of the water. Because that would reduce efficiency, which in turn reduces electricity output, which then reduces profit. The

nuclear industry wants to ensure the fish and the sea turtles and the seals and manatees pay the price, not the corporation.

This is all part of routine operation. So are radioactive discharges — into the water and into the air. You don't need an accident — although I'll get to that — to expose surrounding populations to radioactive gases and liquids.

And there can be bursts of really high doses of these, during refueling outages. And there are leaks and spills, too, so accidental releases that are not considered "accidents."

But there is no safe dose of radiation. And living near a nuclear plant, exposed constantly to small doses, can also be harmful, as we've seen in countless studies on humans. So these are doubtless also harmful to animals.

In the UK government's own studies, cesium-137, plutonium-241 and carbon-14 have all been found in honey produced from hives near nuclear installations. In the same study, carbon-14 at higher than background levels was found in cows' milk in areas near nuclear plants. How did it get there? It was deposited in the grass on which the cows feed. As the late John Large pointed out at the time, "cesium-137 should not be turning up in honey at all." (You can find the references to this study in our handbook).

The issue of grazing animals and exposure was brought to light in an investigation carried out in 1982, nine years into the operational life of the Vermont nuclear power plant (it closed in December 2014.)

Locals first noticed higher rates of leukemia and cancers in the human population. Then farm animals grazing close to the reactor began aborting or giving birth to dead or deformed calves. Cancers among cows had been almost unheard of until then.

And soon it was dogs and cats suffering too, prompting a local vet who treated these animals to say there was enough of a likely correlation with the nuclear plant to warrant an investigation. There never was one.

At Beyond Nuclear, we have spent a number of years contesting a proposed new reactor at the Fermi site in Michigan.

We contested this on a number of fronts but the one that lasted the longest pertained to the harm that would come to the endangered Eastern Fox Snake.

The Michigan Department of Natural Resources said that building the plant would "not only kill the endangered Eastern Fox snake but destroy its habitat and possibly exterminate the species from the area."

The nuclear company argued it would create "an alternative habitat" for the snake.

And of course our lapdog regulator went ahead and issued the construction license. (Although it's not under construction.)

This notion that species can be picked up and moved to a place of human's choosing, regardless of the suitability of the habitat or the effect on the indigenous species there, comes up over and over again.

It's true at Yucca Mountain, Nevada, the still canceled but the *only* selected site for all of the US's high level radioactive reactor waste. There, the fragile desert tortoise would be relocated to outside of its home range.

At the also still canceled for now Wylfa Newydd site in Wales, Horizon claimed that given it would have to raze and flatten entire hillsides for the new site, it would move species — including owls— elsewhere and, if in fact site construction went ahead and THEN the two reactor plan was aborted, they would move these species back again. Even though their old habitat, by then, would be dramatically altered if not destroyed altogether.

So let's turn now to the what if's. What if there was a serious accident? Please don't listen to any propaganda from the pro-nuclear side that talking about a serious accident at Sizewell is "alarmist" or "fear-mongering." It's a realistic possibility and one that should be planned for and taken seriously. We have the science on our side — contrary to what you might hear. The nuclear people are engineers — they are not biologists or zoologists or botanists or doctors. This is not their field. We know that exposure to ionizing radiation causes cancers and leukemias. And we know that an accident is a very real possibility as we have seen them happen already.

Bear in mind that the reactors that exploded and melted down at Fukushima in Japan were American reactors, operating in a highly mechanized and technically proficient society.

The only reason the contamination of wildlife and nature in Japan isn't infinitely worse is because the wind was blowing out to sea that day. Luck.

The reason the disaster happened in the first place is the reason it could and possibly *will* happen here: the collusion of government, industry and regulator.

Another reason it could happen is human error. That was the cause at Chernobyl and at Three Mile Island. Human error can happen anywhere.

And another reason is the one that was communicated so powerfully in the French documentary — *The French Nuclear Trap* — which perhaps you saw here recently.

The French Nuclear Trap, exposed the truly lamentable safety record of EDF and the Areva EPR design. In the film, building the EPR was even referred to as "suicide". The EPR is new, unproven and untested.

There is zero reason to be confident that the untested EPR design is even remotely safe. It's a so-called flagship that is more like a shipwreck.

As you saw in the film, or know already, there have been endless technical, safety and transparency problems from the very start at the EPRs underway at Flamanville in France and in Olkiluoto, Finland. Even fundamentals like the concrete pour of the reactor foundation at Flamanville had to be redone. The Flamanville containment came from a forge which falsified quality control data and installed counterfeit parts; the vessel head is defective. These are key safety components.

So what happens to Minsmere and the surrounding landscape and its inhabitants, animal and human, if there is a serious accident at Sizewell?

At Three Mile Island, where the true extent of radioactive releases was suppressed by a judge, there are multiple examples of sudden deaths and strange illnesses among animals (as well as people, of course.) Because of the court order, none of this was adequately studied at the time because of the following constraints:

(1) Those studying the health impact of Three Mile Island radiation emissions were prohibited from assessing "worst case estimates" of radiation releases unless such estimates would lead to a conclusion of insignificant amount of harm — that being "less than 0.01 health effects".
(2) If a researcher wanted to claim more harm or investigate a worst-case scenario, an expert selected by nuclear industry insurers would have to "concur on the nature and scope of the [dosimetry] projects."

But Chernobyl, and now Fukushima, have been extensively studied. Bear in mind that at Fukushima, it is still too soon to assess the long-term and permanent damage given the incubation period of some of the diseases caused by radiation exposure. But even still we have already seen:

Macaque monkeys whose bone marrows aren't producing white blood cells and whose young are being born with reduced brain sizes. They are an important sentinel because our DNA differs from theirs by only 7%.

The monkeys are suffering in this way because of course they did not evacuate. So they are exposed on a daily basis to what would be considered low levels of radiation and even so, we are seeing these extremely serious health effects with long-term implications for the wellbeing of future generations.

And we know this is a result of radiation exposure, not only because their symptoms match the effects of exposure, but because these monkeys had been extensively studied before the accident. There are just rather a lot of them, so they were periodically culled and scientists got some of the carcasses.

So, when you hear the pro-nuclear pundits dismiss the Fukushima contamination as negligible and low-level, remember that EVEN that so-called low level is having this drastic an effect. And again, as I said, it is only low level — but not harmless — thanks to luck. Because that wind was blowing out to sea.

A decline in the butterfly population has also been observed in Fukushima. And we will not know for a while the true extent of the harm to biodiversity and the environment there.

In Chernobyl you have probably seen stories about animals "thriving." While it might appear that the absence of humans is beneficial to animals, the rates of radiation they are exposed to isn't. So around Chernobyl there are birds with cataracts (a problem as they can't hunt); low to zero sperm counts, and birds and mammals with decreased pregnancy rates and tumors. The higher the radiation levels, the greater frequency of tumors. And, most eerily, there is no decay among leaf litter and fallen trees because the microbes responsible are gone.

So there are clearly some very ominous long-term implications in all this, even if, in the near-term, the animals seem to be proliferating in the absence of humans.

Even animals living far away from the 1986 Chernobyl accident are still affected today. Wild boar in Germany are too radioactive to eat. So are reindeer in the Nordic countries. And it took 26 years before restrictions were lifted on the movement of sheep in England and Wales post Chernobyl.

Things don't go very well for domestic animals, either, when there is a major nuclear disaster. We saw the heartbreaking photos of dead and dying cows in Fukushima left to starve. And the dogs and cats roaming the deserted streets or left chained outside abandoned homes.

You perhaps saw the emotional episode of the television series, *Chernobyl*, when soldiers were sent to shoot the cats and dogs left behind there. They didn't get all of them. In Chernobyl there is a project today dealing with the stray dogs and cats that have multiplied around the site. They are being sterilized and vaccinated but their lifespans are short.

So when you ask that very important question about whether EDF will keep its environmental promises, there is absolutely no level of certainty that it will.

And even if we remove animals from the equation here, we must think of people too, your constituents. Are you really willing to bring such an irresponsible company into your county? Into you community? To play Russian roulette with the health, wellbeing and frankly lives of your constituents? And to see them wreck the countryside to make money for a French government corporation?

The climate crisis is our doing. We're responsible. That makes us responsible for the protection of animals and their habitat, too. It is up to us to eliminate any added burdens that may hasten their demise or extinction. That means ending our use of nuclear power, not expanding it.

We don't have to spend time wondering if EDF will do the right thing and protect this Area of Outstanding Natural Beauty. We can — and we *must* — just tell them to pack their bags and leave.