

# beyond rescue: animals in disasters



**ifaw**

Europe

**1.5 times more  
natural disasters  
declared between  
2010 and 2019 than  
the decade before.  
217 million people  
and likely billions of  
animals are at risk  
of disasters every  
year.**

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### **About IFAW**

International Fund for Animal Welfare (IFAW) is a global non-profit helping animals and people thrive together. We are experts and everyday people, working across seas, oceans, and in more than 40 countries around the world. We rescue, rehabilitate, and release animals, and we restore and protect their natural habitats. The problems we're up against are urgent and complicated. To solve them, we match fresh thinking with bold action. We partner with local communities, governments, non-governmental organisations, and businesses. Together, we pioneer new and innovative ways to help all species flourish. **See how at [ifaw.org](http://ifaw.org)**

Cover photo: © IFAW/Melanie Mahoney



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# foreword

On this shared stage of a dynamic earth, it is no surprise that disasters are a fact of life, a burden shared by both ourselves and the planet's animals. In the era of climate change, it is also evident that humankind has aggravated the planetary system, pushing imbalances and testing the ability of the earth's natural processes to self-regulate.

Disasters are escalating in both frequency and severity, unleashing devastation on a scale that is sadly becoming all too familiar. Within this context, we must fully understand that humans are not alone in facing the resultant outcomes of these ongoing natural disasters. Animals and all wildlife are at the mercy of these events, forced to endure the aftermath that can produce widespread death, habitat fragmentation and destruction, as well as the onset of a new way of life. One key difference is that animals do not have the social support mechanisms of human society, which, while imperfect, are immensely critical in such times of need. It is this need that IFAW and its talented Disaster Response & Risk Reduction team has stepped in to meet.

IFAW has responded to disasters internationally, steadfast in its commitment to each individual animal. Why? **Because each individual matters.** They matter in the context of conservation and due to the inherent value of animals – they also matter because of their inextricable link to the well-being of our human society.

Whether through rehabilitating injured animals, reintroducing wildlife back into its natural environment, or reuniting families with their companion animals, IFAW works to return a sense of normalcy and hope to both human and animal communities that have suddenly found themselves in upheaval.

It cannot go without mention that our world was upturned by the **COVID-19 pandemic** that has upended fundamental aspects of our lives, from changes in our daily routines to basic norms of social interaction.

Not the first disaster of its kind, this virus has triggered the broadest and most socially widespread pandemic since influenza claimed millions of lives at the turn of the last century. Nor will it be the last of its kind. IFAW's Disaster Response & Risk Reduction efforts must evolve to meet such challenges. Though many of us have taken both our personal and professional lives almost fully virtual since the beginning of quarantine, disasters are unmistakable in their physicality. Thus, responders must act in person to provide the most effective relief possible, even though zoonotic disease and the ease of its spread immensely complicates a response for all involved. What does a multispecies evacuation look like while main-taining social distancing? What equipment should be allocated to animals during times of scarcity? Such questions may not be fully answered for some time as we make our way through this new world.

One thing is certain, however – that none of our institutions were adequately prepared for a pandemic; disease is one type of global disaster that modern society has tended to dismiss and ignore.

**We cannot go down this same path again.**

The work the IFAW team does on-site and behind the scenes is critical, as are the lessons learned, for those are the lessons that will guide us as we propose and implement solutions to reduce the suffering of both animals and people in disasters yet to be faced. As disasters are a shared burden, let us ensure that our solutions provide a shared relief.

To your safety and to the future.



*Azzedine Downes*

Azzedine Downes  
President & CEO,  
International Fund for Animal  
Welfare

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◀ IFAW responder rescuing a dog after a hurricane separated it from its owner. We aim to reunite animals with their human families.



# introduction

Extreme weather events, heatwaves, droughts, flooding, wildfires, mudslides and earthquakes are on the rise at the global level. Multiple times a month, a disaster (natural or man-made) hits the headlines, exposing the fatalities, disrupted services and economic losses. Not only their frequency, but also their increased severity and length are a matter of concern as the number of people and assets exposed to them continues to grow. Disaster risks have existed at all times. The 21<sup>st</sup> century has started with their continued amplification driven by urbanization, the destruction or the weakening of environmental

ecosystems but also climate change. As people find themselves in more marginalized and risk prone locations, the animals that they are responsible for or co-exist with also find themselves in harm's way.

Europe (and Member States, overseas territories) is no exception to that trend. There is an annual average temperature already exceeding the global 1°C temperature average above the pre-industrial level and there is an increasing urban population, whose encroachment on wild habitats will restrict wildlife's ability to adapt to the ongoing changes. In addition,

there is an endless appetite for resources leading to a continued degradation of ecosystems and biodiversity.<sup>1</sup> These factors are all at play for Europe to face even more extreme events if the implementation of mitigation measures is delayed. The July 2021 floods hitting Belgium, Germany and the Netherlands and Spain later in September, as well as the August wildfires in Greece or Portugal are alarming examples.

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▲ Trained responders deploy on a flood water rescue mission in North Carolina after Hurricane Florence.



If Europe had developed instruments, mechanisms and tools to support Member States in better managing disaster risks and mitigating impacts on people and their property, it failed, so far, to integrate animals into the humanitarian model of disaster management. Within Europe, more than 500 million people own and care for livestock and companion animals in huge numbers. Animals provide well-being and companionship, food security, health and economic benefits as well as livelihoods security.

As animals and their owners are exposed to and become victims of disasters, more voices from civil society to civil security rise, calling

for animal welfare to be included into European disaster management plans in a consistent and coordinated manner. Doing so will answer ethical, economical, sanitary, social, cultural expectations and will benefit communities in their recovery phase.

This *Animals in Disasters* report highlights, through existing legal frameworks, opportunities, case studies and IFAW expertise, why it is time to act now.

**300.000  
animals  
rescued,  
treated,  
transported  
or sheltered  
since 2000**

▲ Wildlife like this koala can be severely affected by wildfires directly or indirectly through destruction of their habitat.

<sup>1</sup> <https://op.europa.eu/en/publication-detail/-/publication/285d038f-b543-11e7-837e-01aa75ed71a1/language-en>



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# animals in disasters: situation in Europe and opportunities

According to the [WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes](#), between 1970 and 2019, there were more than 11.000 disasters attributed to weather, climate and water-related hazards, which accounted for just over 2 million deaths and US\$ 3.64 trillion in losses.<sup>1</sup> Furthermore, the European Commission also states that “disasters triggered by natural hazards alone cost the EU more than 90.000 lives and more than €500 billion of economic losses between 1980 and 2017”.<sup>2</sup> This includes the loss of animals, as animals are currently defined as “economic losses”.

The [UN Sendai Framework for Disaster Risk Reduction \(2015-2030\)](#) provides Member States with specific actions and goals, but also a framework for disaster risk reduction. It states that one of these goals is “to strengthen and promote the collaboration and capacity building for the protection of productive assets, including livestock, working animals, tools and seeds”.<sup>3</sup> As a signatory to the [UN Sendai Framework for Disaster Risk Reduction](#), the European Commission aims to ensure that disaster preparedness is systematically embedded across all sectors into humanitarian aid programs and projects.<sup>4</sup> When an emergency overwhelms the response capabilities of a country in Europe and beyond, that affected country can request assistance from the [EU Civil Protection Mechanism](#) through the [Emergency Response Coordination Centre](#).<sup>5</sup>

In 2020, the Mechanism was activated more than 100 times, including in response to the coronavirus pandemic; the explosion in Beirut in Lebanon; the earthquake in Croatia; and tropical cyclones in Latin America and Asia. The European Commission also recognises that “good cooperation with non-governmental organisations and stakeholders in ‘peacetime’ provides the foundation for effective measures in a natural disaster”<sup>6</sup> and that “actions to reduce the vulnerability of the population, economic activities, including critical infrastructure, animal welfare and wildlife, environmental and cultural resources such as biodiversity, forest ecosystem services and water resources, are of the utmost importance”.<sup>7</sup>

In order to understand the challenges that European countries face in the matter, the European Commission launched an online questionnaire in 2017 on emergency preparedness of veterinary services in the context of disasters and collected responses from 20 Member States. Out of these 20 countries, only six responded they had not experienced any natural disasters in the last twelve years (2006-2017). The remaining 14 Member States had experienced floods (13), forest fires (10), strong winds/storms (6), major power cuts (3), excessive snow/rain fall (3), drought (4), landslides (3), and/or earthquakes (2).<sup>8</sup> The conclusion of the survey is that the rescue of companion and farm animals impacted by a disaster is not always well integrated into national civil protection mechanisms, while the level of preparedness varies significantly across EU countries.

Failing to include animals in emergency plans can be problematic in many ways. Some people refuse evacuation orders if their pets are not evacuated with them, which not only endangers the lives of owners and their pets but also those of rescue workers and wastes valuable time. Failure to consider animals in a natural disaster scenario can also quickly create a significant health problem through the possible transmission of zoonotic diseases that can be passed on to humans, and through the contamination of drinking water by animal carcasses. These are only several among numerous economic, cultural, and moral reasons to ensure the safety of animals.

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◀ Dogs and other pets are currently not considered consistently in disaster response plans across Europe.

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<sup>1</sup> [https://library.wmo.int/doc\\_num.php?explnum\\_id=10989](https://library.wmo.int/doc_num.php?explnum_id=10989)

<sup>2</sup> <https://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment-2>

<sup>3</sup> United Nations General Assembly (2015), “Sendai Framework for Disaster Risk Reduction (2015–2030) – Resolution adopted by the General Assembly on 3 June 2015” <https://www.undrr.org/implementing-sendai-framework/what-sendai-framework>

<sup>4</sup> [https://ec.europa.eu/echo/what/humanitarian-aid/disaster-preparedness\\_en](https://ec.europa.eu/echo/what/humanitarian-aid/disaster-preparedness_en)

<sup>5</sup> [https://ec.europa.eu/echo/what/civil-protection/emergency-response-coordination-centre-ercc\\_en](https://ec.europa.eu/echo/what/civil-protection/emergency-response-coordination-centre-ercc_en)

<sup>6</sup> [https://ec.europa.eu/food/audits-analysis/overview\\_reports/details.cfm?rep\\_id=124&rep\\_inspection\\_ref=xxx](https://ec.europa.eu/food/audits-analysis/overview_reports/details.cfm?rep_id=124&rep_inspection_ref=xxx)

<sup>7</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019D0420>

<sup>8</sup> [https://ec.europa.eu/food/audits-analysis/overview\\_reports/details.cfm?rep\\_id=124&rep\\_inspection\\_ref=xxx](https://ec.europa.eu/food/audits-analysis/overview_reports/details.cfm?rep_id=124&rep_inspection_ref=xxx)



# legal status of animals

Under EU Treaties, animals are recognised as sentient beings.<sup>1</sup> Consequently, the EU and its Member States must pay due regard to the welfare requirements of animals when preparing and implementing EU policies in, for example, agriculture or internal markets.<sup>2</sup>

Article 13 of Title II of the Treaty of Lisbon amending the [Treaty on the Functioning of the European Union](#) (TFEU) states that:

“In formulating and implementing the Union’s agriculture, fisheries, transport, internal market, research and technological development and space policies, the Union and the Member States shall, since animals are sentient beings, pay full regard to the welfare requirements of animals, while respecting the legislative or administrative provisions and customs of the EU countries relating in particular to religious rites, cultural traditions and regional heritage.”<sup>3</sup>

The legal status and position of animals in a disaster scenario varies among countries. We can, for instance, look at Germany and France.

In July 2002, Germany declared that “animals are not objects and should be protected by special laws.” For the first time, animal rights were awarded a place next to those given to humans in the Constitution. Since 2002, the German Constitution states that “**animals, like humans, have the right to be respected by the state and to have their dignity protected**”.<sup>4</sup> Despite such important legal recognition, implementation lags behind. Although animals are mentioned in disaster risk analyses in Germany, there do not seem to be official evacuation plans concerning domestic animals and wildlife. The case of livestock seems to have been explored a little further, but evacuation goes either unmentioned or is considered complicated. Issues such as loading, transport and accommodation capacity have been explored in a storm scenario with domestic animals and livestock, but it seems that no solution has been found for the moment concerning significant evacuation procedures.<sup>5</sup>

In 2015, the French Parliament affirmed<sup>6</sup> the legal status of an animal as a “sentient living being”. Here, too, expanded legal consideration has not necessarily resulted in real-world change.<sup>7</sup>

Whereas pets and domestic animals are mentioned in the national [ORSEC \(Organisation of Rescue\)](#) plan as possible hindering factors to the smooth evacuation of the population and should therefore be considered, there does not seem to be an actual plan to achieve this.

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▲ Animals are sentient beings that suffer in disasters and need help.

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- 1 [https://ec.europa.eu/food/animals/welfare\\_en](https://ec.europa.eu/food/animals/welfare_en)
- 2 <https://www.fondation-droit-animal.org/%20proceedings-aw/the-european-union-%20legislation-on-animal-welfare>
- 3 [https://ec.europa.eu/food/animals/welfare\\_en](https://ec.europa.eu/food/animals/welfare_en)
- 4 Basic Law for the Federal Republic of Germany, Article 20a
- 5 [https://www.bbk.bund.de/DE/Home/home\\_node.html](https://www.bbk.bund.de/DE/Home/home_node.html)
- 6 <https://www.parlement.fr>
- 7 Droit Civil, Droit des Biens, 2015, article 515-14: <https://univ-droit.fr/la-gazette-juridique/18288-un-statut-de-l-animal-dans-le-code-civil>  
<https://www.loc.gov/item/global-legal-monitor/2014-04-25/france-animals-granted-new-legal-status/>

# economic aspect of saving animals during disasters

Disasters are economic events. Whether we like it or not, the largest proportion of the world's domesticated animals are "productive assets" and protecting them is critical to economic security and growth. Animals keep the wheels of economies turning and provide important nutrition to billions of people. Animal agricultural products are crucial economic assets.

The lack of integration of animal welfare in disaster management response within the EU puts critical economic assets at risk of loss and decreased production. The same lack of focus of the benefit of animal welfare within the humanitarian efforts of the EU leads to delayed economic growth and increases the time it takes vulnerable communities to recover. Including animal welfare in disaster responses remains one of the most effective ways of securing economic benefit after a disaster. This was demonstrated in a study by Campbell and Knowles in 2014 showing that for every dollar spent in early-stage intervention for animals in the Dhemaji floods in India in 2012, 96 dollars of economic benefit in livestock production were secured.<sup>1</sup> This cost benefit is far higher than many humanitarian interventions and should be a focus for cost effectiveness of humanitarian work.



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Between 2018 and 2021, IFAW has supported a series of three workshops on animal welfare in natural disasters organised in the framework of the World Organisation for Animal Health (OIE) Platform on Animal Welfare in Europe. These workshops focused on the role of Veterinary Services in safeguarding animal welfare in the context of natural disasters, especially floods, and were attended by Veterinary Services from Balkan countries. The participants were provided with the information needed to develop Veterinary Services – Contingency Plans (VS-CP) through technical lectures on the disaster management cycle, risk analysis, available IT tools, communication strategy, public awareness, planning and building capacity for response in emergencies. The project has already borne results:

## Bulgaria

Veterinary authorities have recently approved a contingency plan for veterinary measures in case of natural disasters as part of the

National Disaster Protection Plan.

## Romania

The National Sanitary Veterinary and Food Safety Authority has elaborated a contingency plan for the management and risk reduction of animal health and welfare and veterinary public health in the case of floods.

## North Macedonia

Officials have engaged in a cooperation agreement with the Red Cross for the provision of emergency services during or immediately after a catastrophic event.

▲ Farm animals are critical in the recovery phase after every disaster, and thus another reason to integrate their protection in disaster management plans.

<sup>1</sup> [https://onlineasdma.assam.gov.in/kmp/pdf/1491459716livestock\\_disaster\\_economics.pdf](https://onlineasdma.assam.gov.in/kmp/pdf/1491459716livestock_disaster_economics.pdf)



© IFAW/Scott Anger

# ifaw's disaster response programme

IFAW protects animals and the places they call home. As one of the only global non-governmental organisations that focuses on both conservation and animal rescue, we are in a unique position to address a broad range of threats to wildlife and domesticated animals. Our Disaster Response & Risk Reduction programme dispatches emergency response teams to areas around the world where animals are in distress, whether as a result of natural or human causes. While many natural disasters cause great financial hardship and can tragically result in loss of human life, animals are often overlooked in the chaos.

Domesticated animals, dependent on human caretakers for survival, are often left to suffer, and even though wildlife has adapted to extreme situations to some extent, they can often be victims of injury or desperately lack food and shelter as a result of the disaster. Even when the worst is over, natural habitats may take months or years

to recover to the point where native species can return – assuming that these animals had anywhere else to go in the first place, hemmed in as they may be by civilization as islands of nature in a sea of development. **To lessen animals' suffering and give urgently needed support to communities, IFAW leads, funds and helps animal rescue groups to assess disaster situations, formulate plans, and act.** We provide food, equipment, medical supplies, and emergency expertise to help rescue, care for, and when safe to do so, reunify pets with their families and return wildlife back to the wild. IFAW is constantly forging new collaborations to establish robust Animal Rescue Networks (ARN) in strategic locations around the world, including Southeast Asia, India, Latin America, Europe, East Africa, the Greater Caribbean and the United States. This helps to build local response capacity for our partners through best practices that standardise preparedness, response and recovery protocols at the community level.

## ifaw's programme impact in FY21:

**51.499**

companion animals

**4.637**

farmed animals

**3.805**

wild animals

**28**

disaster relief events

**22**

countries



© IFAW/Einar Magnus Magnusson

Three quarters of our resources in this arena are dedicated toward disaster preparedness and risk reduction including technical trainings, response planning, and risk assessments; the remaining quarter goes toward mobilizing responses when a disaster strikes.

This ratio is deliberate and reflects the importance of establishing functional systems before we need them. Indeed, the first core principle of the European Commission strategic plan is to build a culture of preparedness.<sup>1</sup>

IFAW collaborates with governments, institutions, organisations and foundations around the world to help rescue and protect animals. IFAW's Disaster Response and Preparedness grants are made possible through the generous contributions of IFAW supporters and partners around the world.

IFAW's partnerships also include, among others, the Wildlife Trust of India (during the devastating floods in the Indian State of Assam) and local organisations and communities during floods in Myanmar. As a member of the OIE (World Organisation for Animal Health) Platform on Animal Welfare in Europe, IFAW has supported workshops on the role of Veterinary Services in safeguarding animal welfare in disasters.

During the earthquake in 2018 in Indonesia, regional partners included the Centre for Orangutan Protection (COP), the Jakarta Animal Aid Network (JAAN), and the Bali Animal Welfare Association (BAWA). Through IFAW's grants, our partners were able to send a team to Palu and Donggala, where they rescued animals from rubble and performed health assessments.

Over the years, we have developed strong working relationships with our ARN partners. When disaster strikes, we unite as a strong force to aid communities affected by tragedies.

▲ After a volcano erupted in Southern Iceland, IFAW worked as a consultant for the Icelandic Veterinary Authority and Department of Agriculture.

◀ A search and rescue vehicle drives through the firegrounds during the 2018 Camp Fires in Butte County in California, U.S.

<sup>1</sup> [https://ec.europa.eu/echo/what/civil-protection/european-disaster-risk-management\\_en](https://ec.europa.eu/echo/what/civil-protection/european-disaster-risk-management_en)



# natural disasters

There are almost limitless ways that weather and extreme environmental events can make our lives and the lives of animals difficult or even perilous. 2021 showed unprecedented natural disasters across Europe. Countries including Belgium, Germany, Luxembourg and the Netherlands received two months of rain in just two days, causing deadly flash floods.<sup>1</sup> Southern Europe experienced record-breaking high summer temperatures accompanied by devastating wildfires in Greece, Turkey and Sardinia.

In this report, we focus on events that arise suddenly and require an immediate response. It is important to note that the groundwork for a disaster is often laid far in advance. For example, drought conditions or the spread of invasive pine bark beetles can slowly dry a forest for months or years, priming timber to burst into flames after a lightning strike or errant campfire ember.

Therefore, long-term and incremental planning is justified – indeed, required – as well as the all-hands-on-deck response operations that commence when such conditions metastasize into full-blown emergencies.

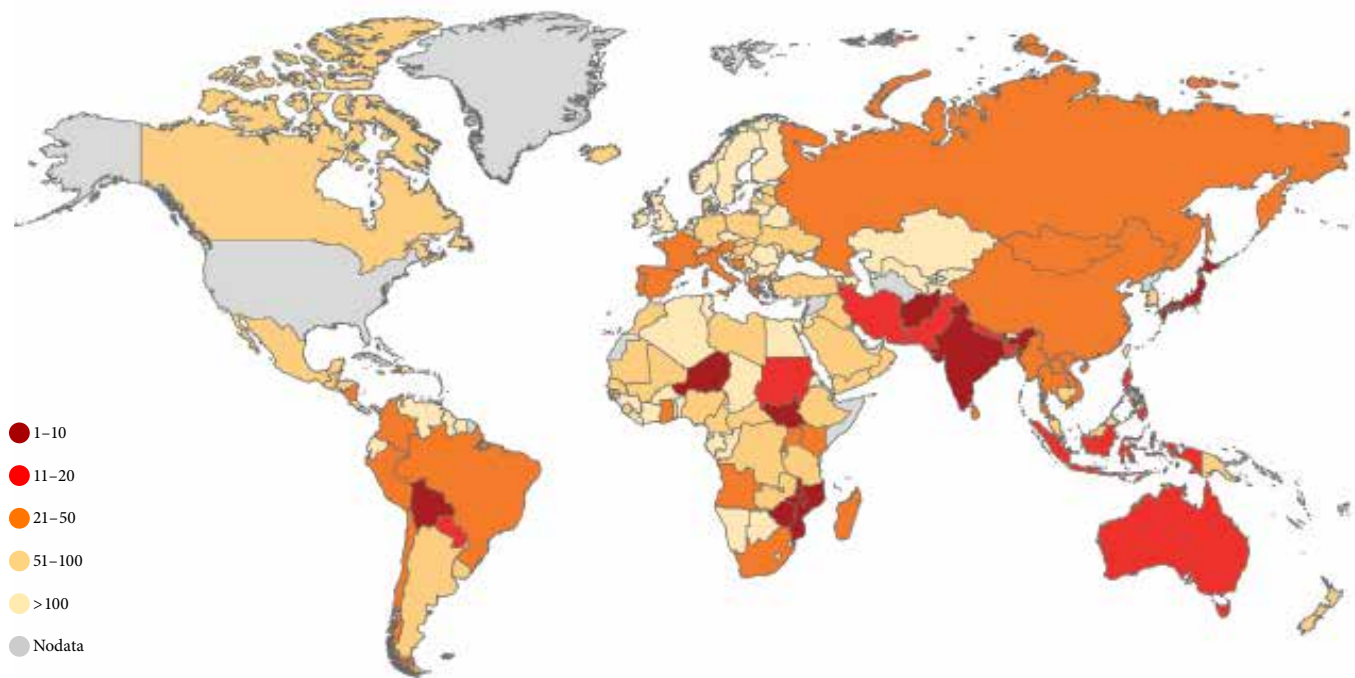
A weather or geophysical event, by itself, is not a natural disaster. In fact, IUCN calls disasters “social constructs,” rightly pointing out that “they are largely determined by how society manages its environment, how prepared it is to face adversity, and what resources are available for recovery.” Although nature’s extremes land on all of us with the same force, the poorest people pay the highest costs.

However we define them, the costs of such events are high, and growing. Over the past several decades, damage caused by disasters has been on the rise in Europe. Infectious diseases and heat waves have recorded the most fatalities, with heat waves accounting for 85% of the 91.455 fatalities associated with climatic and geophysical disasters in the EU from 1980 to 2017.

**77.737**  
**fatalities in**  
**the EU from**  
**heat waves**  
**between 1980**  
**and 2017**

▲ A dog amid floodwaters. With at least 184 deaths, the 2021 floods are the deadliest natural disaster in Germany since the North Sea flood of 1962.

# global climate risk index ranking 2019



Storms, floods and earthquakes were the costliest natural hazards in terms of economic losses. The EU and neighbouring countries were also hit with some of its strongest earthquakes in years.<sup>2</sup>

In 2018, Germany ranked 3<sup>rd</sup> among the countries worldwide most heavily impacted by weather-related natural disaster events.<sup>3</sup>

For any given disaster, there may be dozens, if not hundreds, of root causes and contributing factors. Our long-term planning should shine a light on those factors just as much, if not more so, than their dramatic consequences. Whatever the causes, disaster preparations at all levels – from government agencies to household plans – must be comprehensive and include provisions for animals. They must also account for complex scenarios because a single event – a hurricane, an earthquake, a wildfire, a storm or severe rainfall – can lead to multiple threats that cascade and magnify each other. For instance, during an earthquake, the danger from seismic activity is not limited to shaking buildings. It can also disrupt

electrical service, fracture roads, ignite fires, and otherwise create more hurdles for victims and responders.

According to the Intergovernmental Panel on Climate Change (IPCC), heavy rainfall events such as those that hit Germany in July 2021 are likely to become recurrent and increase the risk of flooding in high-latitude regions such as northern Europe and northern Asia.<sup>4</sup>

**“At a global scale, river floods are projected to occur more frequently and intensely under a global warming scenario of 1.5°C. Reaching 2°C instead of 1.5°C would have a stronger effect on heavy rainfall events, flood events and high flows in rivers.”**

The Mediterranean climate and hot, dry summers in southern France make this area especially vulnerable to drought and wildfires. In August 2021, a wildfire destroyed half of the Plaine des Maures nature reserve – one of the Mediterranean’s jewels of biodiversity, unique in all of Europe.<sup>6</sup>

▲ Global climate risk index ranking 2019.  
<https://www.germanwatch.org/en/16046>

- 1 <https://news.un.org/en/story/2021/07/1096012>
- 2 <https://op.europa.eu/en/publication-detail/-/publication/285d038f-b543-11e7-837e-01aa75ed71a1/language-en>
- 3 <https://germanwatch.org/sites/default/files/publication/20432.pdf>
- 4 [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Full\\_Report.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf)
- 5 [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Full\\_Report.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf)  
<https://agupubs.onlinelibrary.wiley.com/doi/10.1002/2018EFO00813>  
<https://agupubs.onlinelibrary.wiley.com/doi/10.1002/eft2.136>  
<https://iopscience.iop.org/article/10.1088/1748-9326/aab792>
- 6 <https://www.preventionweb.net/news/french-wildfires-have-destroyed-one-most-unique-biodiversity-hotspots-europe>

# climate change as an amplifier

Over the last few decades, a major complicating factor has played havoc with our planet's weather patterns: anthropogenic climatic change. As the [EU Council](#), [European Commission](#), and the [European Defence Agency](#) emphasized in their June 2020 [Conclusions on Security and Defence](#): "It is clear that climate change is an urgent and growing threat to our national security, contributing to increased natural disasters, refugee flows, and conflicts over basic resources such as food and water. These impacts

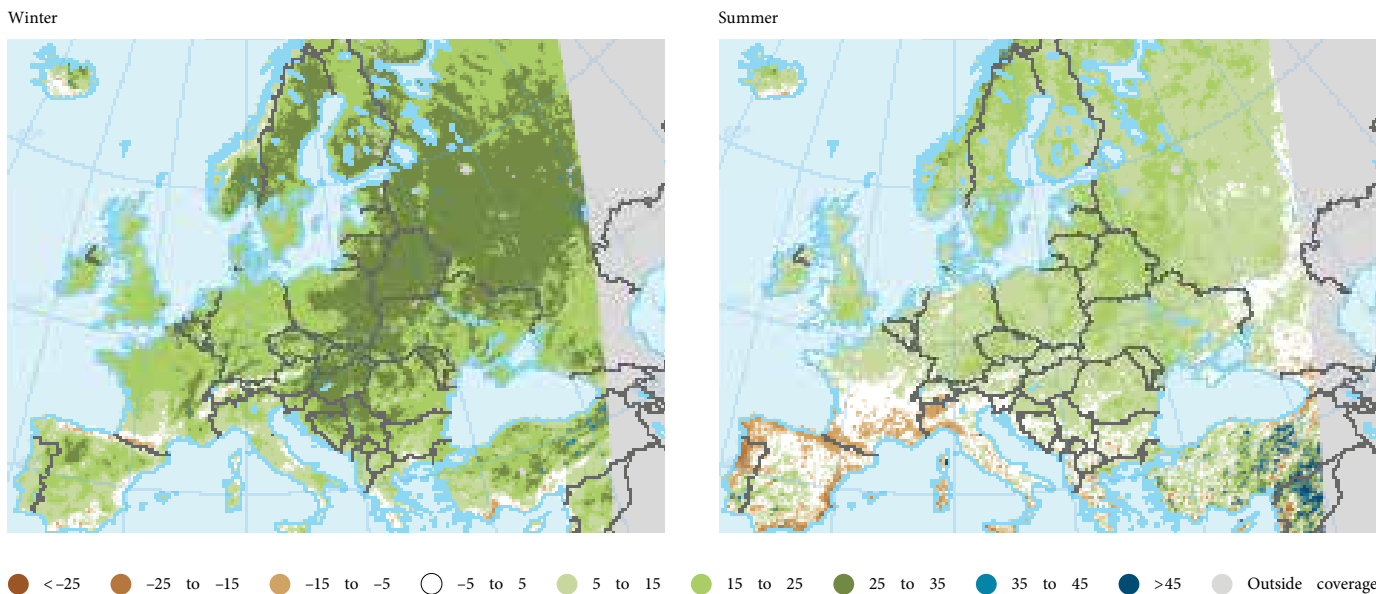
are already occurring, and the scope, scale, and intensity of these impacts are projected to increase over time".!

It is tempting to consider climate change to be a phenomenon that operates at a lower register than, for instance, a volcanic eruption – like an insistent background hum that grows louder only gradually, without us noticing it daily. This model fits in some respects: sea levels are rising year by year due to melting polar ice sheets and thermal expansion and average annual temperatures are

creeping up. But climate change has its most dramatic effects as an amplifier. Climate change doesn't cause storms, but it makes them more powerful and more frequent. It doesn't cause wildfires, but it sets the table for drier woodlands that burn hotter and longer. These trends will only accelerate as certain "tipping points" are reached and greenhouse gas emissions increase and create an ever more vicious cycle of geophysical activity.

Most of us are aware of the marquee threats of climate change and ocean

## heavy winter and summer precipitation change (%)



Projected change in heavy precipitation (heavy rain and flash floods) in winter and summer.  
© European Environment Agency (EEA) (2014).

<https://www.eea.europa.eu/data-and-maps/figures/projected-changes-in-20-year-2>

We acknowledge the World Climate Research Programme's Working Group on Regional Climate, and the Working Group on Coupled Modelling, former coordinating body of CORDEX and responsible panel for CMIP5. We also thank the climate modelling groups for producing and making available their model output. We also acknowledge the Earth System Grid

Federation infrastructure an international effort led by the U.S. Department of Energy's Program for Climate Model Diagnosis and Intercomparison, the European Network for Earth System Modelling and other partners in the Global Organisation for Earth System Science Portals (GO-ESSP).



acidification, but climatological shifts are also changing the landscape in subtler ways. The [European Environment Agency](#) has identified many regions in Europe anticipated to face worsening impacts from climate change, including drought, heavy rain and flooding, forest fires and sea level rise.<sup>2</sup> Urban areas in Europe will also be affected by climate change and more particularly flooding. Due to the rise of the sea level combined with storm surges, low-lying cities in Belgium, the Netherlands, Germany and also along Italy's northern coast – such as Venice – are among those most at risk of coastal flooding.<sup>3</sup> The European Environment Agency's report, [The European Environment – state and outlook 2020](#), includes a non-binding policy objective calling

on countries to strengthen resilience and the capacity to adapt to climate-related hazards and natural disasters in all countries by 2030.<sup>4</sup>

Meanwhile, in the oceans, marine heat waves have surged in frequency and intensity over the last century, contributing to coral bleaching, seagrass die-offs, and other severe impacts to biodiversity and ecosystem services.<sup>5</sup> Ecosystem features function to mitigate the destructive effects of extreme weather. Coral reefs, for instance, dramatically reduce wave energy during storms, protecting coastlines.<sup>6</sup>

Similarly, healthy, non-desiccated soil has greater capacity to retain water, reducing the risk of dangerous

floods. Based on aspects of soil protection such as those recommended by the European Commission in the [Common Agricultural Policy \(CAP\)](#) under the [Good Agricultural and Environmental Conditions \(GAEC\)](#), it is important that “an obligation not to plough wetlands and carbon-rich soils, to limit erosion, retain and improve organic matter, and avoid compaction is implemented in the European Union”.<sup>7</sup>

As the geography of land and sea changes, so will the places that extreme weather impacts. We will need to prepare for threats to strike places that, formerly, were better protected.

## overall weather-driven forest fire danger

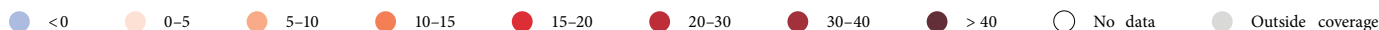
Present climate 1981–2010



Change for 2°C global warming



Change for high emissions (2071–2100)



Forest fire danger in the present climate and projected changes under two climate change scenarios.

© Projections of Fire Weather Index (PESETA III) provided by Joint Research Centre (JRC) (2019).

<https://www.eea.europa.eu/data-and-maps/figures/overall-weather-driven-forest-fire>

1 [https://www.eeas.europa.eu/eeas/towards-climate-proof-security-and-defence-policy-roadmap-eu-action\\_en](https://www.eeas.europa.eu/eeas/towards-climate-proof-security-and-defence-policy-roadmap-eu-action_en)

2 European Environment Agency, The European Environment – state and outlook 2020 <https://www.eea.europa.eu/publications/soer-2020>

3 <https://www.eea.europa.eu/ims/global-and-european-sea-level-rise>

4 © European Environment Agency, 2019 <https://www.eea.europa.eu/publications/soer-2020>

5 <https://www.nature.com/articles/s41558-019-0412-1>

6 <https://www.ncbi.nlm.nih.gov/pmc/>

7 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0046>



# how disasters impact animals

When a natural disaster strikes, our first impulse is to get people to safety, and many of us also immediately think about protecting “our” animals. But during a natural disaster, it can be difficult to evacuate animals and provide them with shelter, food, and veterinary services, **unless a system has already been established**. In designing and carrying out emergency plans, it is not enough to leave animals as a last-minute consideration, and this point is driven home when we enumerate the ways in which we interact with and share our space with animals. Depending on the specific animal, they may represent everything from our livelihood to cherished companions, and animals are due – sometimes legally and always ethically – a high standard of care, also when confronted with danger.

Here are just a few of the considerations for different groups of animals:

## **companion animals**

Many people are devoted to the animals they live with and consider them as members of the family. In the event of a disaster, if pet owners are not at home or otherwise able to evacuate with their animals, the separation can cause profound anxiety on top of the stresses and dangers attendant to getting oneself to safety. During the floods in the Val-de-Marne department in France in 2016 and 2018, the Val-de-Marne regional delegation of the [Red Cross](#) noted that many victims refused to leave their homes, which had become dangerous or uninhabitable, without their pets.<sup>1</sup> And even in cases where a pet owner can bring their animal to safety, emergency shelters and temporary housing often do not allow cohabitation or have the necessary supplies, such as food or kennels.

## **service animals**

Service animals are trained animals that aid people with a disability, such as visually impaired individuals, people with mental health needs, or those who suffer from seizures. While service animals are typically assumed to be dogs in Europe, there are no real restrictions considering a subset of service animals: “emotional support animals”.<sup>2</sup> Depending on the person’s level of mobility and independence, evacuation during an emergency may require extra planning, time, and resources. Service animals are by law allowed to cohabitate with their owners, but the bonus lies upon owners to confirm that appropriate support services for their service animals are planned for and available through their local emergency management system. Information on applicable European laws and regulations has proven difficult to collate, which in practice likely adds a layer of confusion that negatively impacts both owners and their animals during an emergency.



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## livestock and poultry

Cattle, sheep, chickens, pigs, and other livestock are raised around Europe in industrial facilities, urban coops, backyards, and more. These animals are often a crucial component of a person's livelihood and can have an emotional component, as well as having an economic value for the country. Except for some larger farms and grazing allotments, they are often constrained by fences or other man-made barriers, or are housed indoors, as in the case of most large-scale poultry operations. Such constraints can provide both certainty (i.e., rescuers know where to find them) and danger (i.e., reduced ability to escape from fire or floodwaters) during a disaster. They may require specialized modes of transportation, and larger operations may not have enough trailers or other vehicles on hand to evacuate more than a fraction of their stock at any one time.

Livestock production also introduces disease risk factors, such as when livestock waste holding facilities breach and contaminate surrounding areas and water bodies.

## unowned animals

Stray domesticated or feral animals, often referred to as "unowned animals", can also be impacted in disasters and represent another challenge for rescue operations. Not knowing the health status of these animals makes it imperative for rescuers and rehabilitators to take safety precautions when handling. As a result, and due to logistical issues such as personnel and trapping supplies, the animals are typically left to fend for themselves. Caregivers may hurriedly move feeding stations to higher ground or anchor shelters with heavy objects or tethers, but sometimes the strays are forced to survive on their own.

**to evacuate different types of animals, systems for their care need to be in place beforehand**

- ▲ A fox has survived the floods in Limburg in the Netherlands in the summer of 2021.
- ◀ IFAW Senior Program Officer Jennifer Gardner approaches an injured dog, later named Panda. The team was on an animal search and rescue assignment during the North Complex Fire in California, U.S., when Panda ran towards the rescue vehicle.

<sup>1</sup> <https://valdemarne.croix-rouge.fr/unite-%20assistance-secours-animaux>

<sup>2</sup> <https://esa-europe.eu/emotional-support-animal-definition-essence-meaning/?lang=en>



## **captive wildlife**

Zoos, aquariums, circuses and other exhibitors also face special challenges when dealing with evacuation and emergency care of their animals. Not only do captive wildlife have highly specific needs for environment and diet, but there are often dangers associated with handling certain types of wild animals – to the animal, the handler, or both – and in the case of a natural disaster, trained individuals may be unavailable to provide oversight. Like livestock, they require specialized modes of transportation, though some facilities have hardened infrastructure and a shelter-in-place plan to allow animals to survive extreme weather. In the EU, zoos are encouraged to have an emergency plan for the escape of animals in case of a natural disaster.<sup>1</sup>

The [European Association of Zoos and Aquaria](#) requires that animal-related emergency drills must be performed at least once per year and that multiple animal-related emergency drills and/or other emergency drills (fire, flood, bomb threat, etc) should be practiced according to local legislation.<sup>2</sup> However, in some cases, as water levels rise quickly, evacuation can be deemed complicated for some species. This was the case in the [Prague Zoo](#) during the Elbe flood in 2002<sup>3</sup> and during catastrophic floods in 2015 in the South of France, when over 90% of the Marineland Park in Antibes was destroyed and lost an estimated 1.000 animals, including an orca. It is vital that such facilities ensure adequate coordination with first responders, local authorities and the [European Alliance of Rescue Centers and Sanctuaries \(EARS\)](#).

Non-accredited facilities such as exotic or wild animal owners may pose an even greater challenge, as their location and the risks they present are often unknown to first responders.

## **biomedical research animals**

More than 9.3 million animals (cats, dogs, cattle, horses, donkeys, monkeys, etc) are used for research and testing in the EU annually.<sup>4</sup> Like captive wildlife, animals kept confined for laboratory experiments may have specialized needs and attendant complications during an emergency, so we must plan accordingly. The industry involves huge potential risks in addition to humane considerations, since biomedical research can involve infecting animals with diseases than can be transferred to humans and other animals, including everything from cold viruses to much more serious threats.<sup>5</sup> They require special care to prevent additional pain and trauma in a disaster situation.



## emergency response animals

During a disaster, trained animals, such as detection dogs and patrol horses, are employed to aid humans in search and rescue operations. These animals need proper care amid what can be a chaotic and dangerous situation.

## wildlife

Wild animals are often believed to fend for themselves in disasters. To the contrary, research has shown that extreme weather events can have profound and long-lasting negative impacts on wildlife.<sup>6</sup>

The increased frequency and severity of extreme weather events, combined with already degraded habitats and wildlife compromised by hunting or other human activities, creates a situation from which wild populations may not be able to rebound. Individuals may suffer when they become physically injured, when local food sources are destroyed and no other viable habitat patches are available, or when social species become displaced away from their flocks, packs, or troops. Wild populations suffer when breeding sites are destroyed, diseases are spread following disturbances, or mass mortalities cause local extirpations. Additionally, wild animals that are injured or searching for food or cover after extreme events may enter human populated areas, creating a dangerous situation for

humans and for themselves. Having trained responders on hand to safely capture wild animals, but also ensuring the presence of veterinarians, rehabilitators, and caregivers experienced and equipped to treat animals that cannot immediately be released back to the wild helps to reduce the impact to wild populations and ensures that the public and individual animals remain safe. Compared with domestic animals or captive wildlife, we have less direct control over most non-captive wildlife populations, but communities large and small should be taking evacuation routes into consideration when planning for disasters. For humans, this means roadways; for wildlife, this means wildlife corridors. Maintaining or re-creating threatened habitats to provide safer refuges will give animals the opportunity to escape from harm. Some animal care facilities are also equipped to deal with injured wildlife, allowing for reintroduction after the danger has passed.

- ▲ Responder carefully holds an injured dog rescued from behind the fire line.
- ◀ An IFAW team member walks the rescued dog Boxe before being able to reunite him with his family.

1 <https://ec.europa.eu/environment/nature/pdf/Zoos%20Directive%20Good%20Practices-DE.pdf>

2 <https://www.eaza.net/assets/Uploads/Standards-and-policies/2019-04-EAZA-Standards-for-Accommodation-and-Care.pdf>

3 <https://www.spiegel.de/panorama/prager-zoo-robber-entwischt-gorilla-ertrunken-a-209493.html>

4 <https://www.dpz.eu/de/abteilung/ueber-tierversuche/zahlen-und-fakten/versuchstierzahlen-in-deutschland.html>

5 <https://ec.europa.eu/transparency/regdoc/rep/1/2020/EN/COM-2020-16-F1-EN-MAINPART-1.pdf>

6 "Conservation implications of ecological responses to extreme weather and climate events." <https://onlinelibrary.wiley.com/doi/10.1111/ddi.12878>



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# significant disaster events in Europe

Although not an exhaustive list, the following disaster events in Europe have been considered significant due to their duration, strength or suddenness.

▲ Destruction caused in the city of Breil-sur-Roya in France during storm Alex.

## Saint-Martin/ Sint Maarten: Hurricane Irma 2017

In September 2017, Hurricane Irma, one of the strongest hurricanes ever observed in the Atlantic Ocean, hit the – half French, half Dutch Caribbean Island of Saint-Martin/ Sint Maarten. Several people died, many were injured, and houses and infrastructure were severely damaged, leaving people without a home, basic needs or a source of income.

Irma, with total damages estimated at 3.3 billion euros, also had devastating consequences on animals both on land and at sea. They were either killed, displaced, or left without food sources. Natural habitats such as mangroves, brown Pelican nesting sites, coral reefs and beaches were destroyed or polluted.<sup>1</sup> In St Maarten's Zoo some animals were killed, dozens were reported missing weeks after the event and a few animals were stolen during a looting.<sup>2</sup> Following a hurried evacuation, many owners had to leave without their pets, and some turned down offers in order to stay with their animals. Stray animals populated the streets and an epidemic of canine distemper spread quickly. Also, farm animals were left behind and wandered in the streets. Several goat herders lost half of their livestock to stray dogs. Not all livestock has been accounted for, due to lack of registration and because carcasses were buried quickly to prevent people from eating the meat, which could carry infections.<sup>3</sup>

## storm Alex

### France<sup>4</sup>

<b>when?</b>	October 2020
<b>where?</b>	Alpes-Maritimes, Saint-Martin-Vésubie / Breil-sur-Roya
<b>population</b>	• 9 deaths
<b>infrastructure</b>	<ul style="list-style-type: none"> <li>• 480 severely damaged destroyed buildings</li> <li>• 100 km of destroyed roads</li> <li>• Isolated villages</li> </ul>
<b>animals</b>	<p><b>affected wildlife:</b></p> <ul style="list-style-type: none"> <li>• <u>Wolfpark Alpha</u> partially destroyed: 2 wolf deaths and 8 escaped wolves</li> </ul> <p><b>domestic animals:</b></p> <ul style="list-style-type: none"> <li>• Many strays and injured</li> <li>• In St-Martin-Vésubie: 100–200 cats and dogs trapped in houses one week after event</li> </ul> <p><b>livestock:</b></p> <ul style="list-style-type: none"> <li>• 2.000 – 3.000 sheep and their shepherds stuck in the heights for the following sheepfold destruction</li> </ul>
<b>costs</b>	€500 million – €1 billion
<b>observations</b>	<ul style="list-style-type: none"> <li>• Extraordinary solidarity but difficulties with sheltering pets with owners'</li> <li>• 3 captured wolves, 2 wolves believed to be dead (possibly killed) and other 3 unaccounted for (december 2020)</li> </ul>

Lt Jacques Lavezac – a Lieutenant from the Departmental Fire and Rescue Service of Alpes Maritimes (SDIS06) – responsible for the evacuation of several dogs, stresses the importance of evacuating pets:

**“in operations, animals, like humans, are part of our priorities.”**

<sup>1</sup> <https://www.dcbnd.nl/sites/default/files/documents/BioNews-2017-Issue7-StMaarten-Impact-Hurricane.pdf>

<sup>2</sup> <https://caribbeanetwork.org/2017/10/16/sint-maarten-zoo-faces-imminent-closure>

<sup>3</sup> [https://www.laburba.com/fileadmin/Fichiers/Lab\\_URBA/PROJET\\_DEPOS/Rapport1-Robin\\_des\\_bois.pdf](https://www.laburba.com/fileadmin/Fichiers/Lab_URBA/PROJET_DEPOS/Rapport1-Robin_des_bois.pdf)

<sup>4</sup> <https://www.lefigaro.fr/flash-actu/nouveau-bilan-de-la-tempete-alex-10-morts-et-8-disparus-20210128>

<https://www.francebleu.fr/infos/societe/speciale-france-bleu-azur-en-direct-de-saint-martin-vesubie-six-jours-apres-le-passage-de-la-tempete-1602074667>

<https://www.ville-valbonne.fr/actualite/tempete-alex-mobilisations-pour-les-sinistres>

<https://www.santevet.com/articles/tempete-alex-en-france-quel-bilan-pour-les-animaux>

<https://ofb.gouv.fr/actualites/un-des-loups-canadiens-echappes-du-parc-animalier-alpha-capture-par-loffice-francais-de>

<http://www.agra.fr/l-incertain-bilan-agricole-de-la-temp-te-alex-art465219-2483.html>

	Germany <sup>1</sup>	Netherlands	Belgium <sup>6</sup>
<b>when?</b> <b>where?</b>	July 2021 Rhineland-Palatinate, North Rhine-Westphalia	July 2021 South-Limburg, Downstream of the 'Meuse' and other rivers (Uiterwaarden)	July 2021 Province of Liège, Province of Namur
<b>population</b>	<ul style="list-style-type: none"> <li>• 196 deaths</li> <li>• Thousands injured</li> </ul>	<ul style="list-style-type: none"> <li>• No fatalities</li> </ul>	<ul style="list-style-type: none"> <li>• 42 deaths</li> <li>• 200 .000 urged to evacuate in Liège</li> </ul>
<b>infrastructure</b>	<ul style="list-style-type: none"> <li>• Destruction of houses and bridges</li> <li>• Difficult access</li> <li>• 102.000 people without electricity on 16 July</li> </ul>	<ul style="list-style-type: none"> <li>• 13.000 damaged property claims</li> <li>• 200 reported damage by farmers (destroyed crops)</li> <li>• Valkenburg: 2.300 damaged houses, 700 severely damaged houses, 270 damaged restaurants/cafés, 180 damaged shops</li> <li>• Destroyed and damaged bridges and roads, 2700 cases of damage concerning locks, dams, culverts, banks, waterway markings, paving, soil and nature (Rijkswaterstaat)</li> </ul>	<ul style="list-style-type: none"> <li>• 45.000 – 50 .000 affected homes</li> <li>• 11.000 destroyed vehicles</li> <li>• 41.000 households without electricity in Wallonia</li> </ul>
<b>animals</b>	<p><b>affected wildlife:</b></p> <ul style="list-style-type: none"> <li>• Juveniles of many species.</li> <li>• Small animals (young birds, rabbits and hares)</li> <li>• Larger species (deer)</li> <li>• Several zoos evacuated</li> </ul> <p><b>domestic animals:</b></p> <ul style="list-style-type: none"> <li>• Ahrweiler: At least 4.000 laying hens and 48 other animals (14 cattle, 6 sheep, 2 donkeys, 2 dogs, 1 goat, etc.) were found dead. 48 other animals were rescued by the <a href="#">Federal Association for Animal Rescue (BGDT)</a><sup>2</sup></li> <li>• Trier: 60 rescued pets</li> </ul>	<p><b>affected wildlife:</b></p> <ul style="list-style-type: none"> <li>• Millions of insect and soil animal deaths</li> <li>• Thousands of larger animal deaths<sup>4</sup></li> <li>• Affected fish species</li> </ul> <p><b>domestic animals:</b></p> <ul style="list-style-type: none"> <li>• Recovered dog corpse</li> <li>• Pet care farm evacuation by the local animal ambulance<sup>5</sup></li> </ul> <p><b>livestock:</b></p> <ul style="list-style-type: none"> <li>• Dead sheep, goats and chicken recovery by local animal rescue</li> <li>• Unknown number of cows and sheep deaths along the river</li> </ul>	<p><b>affected wildlife:</b></p> <ul style="list-style-type: none"> <li>• Lack of oxygen in water and oil spills</li> <li>• Theux: Wildlife rescue center treated thousands of freezing and oil covered animals</li> <li>• Some of them had to be transferred to Oostende, specialized in oil-covered animals</li> </ul> <p><b>domestic animals:</b></p> <ul style="list-style-type: none"> <li>• Numerous affected pets</li> <li>• Pets were stuck in houses after evacuation of owners</li> </ul> <p><b>livestock:</b></p> <ul style="list-style-type: none"> <li>• Unknown number</li> <li>• Cow herds had to be relocated</li> <li>• 2 Cows were rescued by the <a href="#">SRPA</a></li> </ul>
<b>costs</b>	More than €29 billion	<ul style="list-style-type: none"> <li>• €500 million total</li> <li>• €200 million direct damage</li> <li>• €200 million business loss from missed (touristic) income</li> <li>• €2.3 million for farmers</li> </ul>	€3 billions
<b>observations</b>	<ul style="list-style-type: none"> <li>• Citizen and animal shelter solidarity (Facebook groups offering help)<sup>3</sup></li> <li>• Rescue patrols by animal welfare organisations and fire brigades</li> <li>• A more centralised coordination structure is being discussed</li> </ul>	<ul style="list-style-type: none"> <li>• Animal shelter offered by several private initiatives</li> <li>• Readiness of animal rescue organisations not used by Security region</li> <li>• Need for coordination and official cooperation</li> <li>• Waste clean-up by 2.000 volunteers along the 'Meuse'</li> <li>• 600 carps swam into the river Meuse after ponds flooded</li> </ul>	<ul style="list-style-type: none"> <li>• 100 km of flooded area</li> <li>• Animal rescue by <a href="#">YUSC</a><sup>7</sup> (thousands) and in collaboration with the <a href="#">ART</a><sup>8</sup> (160 in Liège)</li> <li>• Citizen and animal shelter solidarity (Facebook, help, temporary shelter, etc.)</li> <li>• Veterinary Faculty of the University of Liège offered assistance</li> </ul>



**“I can really understand the concern of these people because it is an animal that you just love and that is a part of your life.”**

**“the fire brigade rescued a cow that travelled 100 km on the Maas river. let us save this cow – after this terrible adventure – from slaughter after surviving such a journey of 100 km.”**

**“we are facing an unprecedented disaster, our disaster medicine courses may be advanced, but living this situation with both feet in the mud makes you put everything into perspective. the distress is omnipresent, both in the eyes of the surviving men and women, but also in the eyes of the animals. as a VUSC, it was only natural to be there to help people overcome this burden. some situations were particularly frustrating. the human and animal victims were close by, but the danger made it impossible for us to reach them and save them.”**

Sixty pets were rescued in Trier, an effort highlighted by Minister President Malu Dreyer (SPD) in a statement.<sup>9</sup>

Pieter van Vollenhoven, a member of the Dutch royal family, asked in a tweet to spare the live of a cow that was carried away in the river and rescued 100 km from its original place.<sup>10</sup>

Professor Hugues Guyot (CVU-ULiège), coordinating veterinarian of the ‘Emergency Veterinarians of the Civil Security’ (VUSC), shares his experience on the ground in Belgium during the floods.<sup>11</sup>

1 <https://www.archysport.com>

<https://www.zeit.de>

<https://www.derwesten.de/panorama>

2 Carolina Wicher, Pressestelle – Kreisverwaltung Ahrweiler

3 Examples of Facebook groups offering help:

<https://www.facebook.com/groups/257582299040266>

<https://www.facebook.com/groups/471180833962112>

4 Fawns, foxes, hares & rabbits, stoats, rodents, badgers and young birds

5 Rescue of rabbits, guinea pigs, chickens and peacocks. Some chicken quail and rabbits did not survive

6 <https://www.rtbf.be>

7 [https://www.cvu.uliege.be/cms/c\\_4053300/en/clinique-veterinaire-universitaire](https://www.cvu.uliege.be/cms/c_4053300/en/clinique-veterinaire-universitaire)

8 ART: Animal Rescue Team

9 <https://www.sueddeutsche.de>

10 <https://www.freepressjournal.in>

11 <https://www.fmv.uliege.be>

	France <sup>1</sup>	Greece <sup>2</sup>	Portugal <sup>5</sup>
<b>when?</b>	16 – 26 August 2021	August 2021	June 2017 / October 2017
<b>where?</b>	Var	Attica, Olympia, Messenia, Euboea	(440 wildfires)
<b>population</b>	<ul style="list-style-type: none"> <li>• 2 deaths</li> <li>• 26 slightly injured (19 civilians, 7 firefighters)</li> <li>• 10.000 evacuated</li> </ul>	<ul style="list-style-type: none"> <li>• 3 deaths</li> <li>• 20 injured</li> <li>• Thousands evacuated</li> </ul>	<ul style="list-style-type: none"> <li>• June: 66 deaths, 204 injured</li> <li>• Pedrogao Grande: Among the deadliest in history</li> <li>• October: 45 deaths</li> </ul>
<b>infrastructure</b>	<ul style="list-style-type: none"> <li>• One camping completely destroyed</li> <li>• One ranch completely destroyed</li> <li>• 100 severely damaged houses</li> </ul>	<ul style="list-style-type: none"> <li>• Evia: 150 destroyed houses</li> <li>• Varybombi: Dozens of destroyed houses, severely damaged bars, businesses and holiday accommodations</li> <li>• Verimpompi: Burned horse club</li> </ul>	—
<b>nature</b>	<ul style="list-style-type: none"> <li>• 8.100 ha covered</li> <li>• 7.000 ha destroyed</li> <li>• Half of the <a href="#">Plaine des Maures nature reserve</a> destroyed</li> <li>• Many vineyards affected</li> </ul>	<ul style="list-style-type: none"> <li>• 100.000 hectares of forest</li> <li>• 125.000 hectares in total</li> <li>• Evia: 1/2 island burned</li> </ul>	<ul style="list-style-type: none"> <li>• June: 44.969 ha burned</li> <li>• October: 200.000 ha burned</li> <li>• 2017: Most burnt country with 1/3 of total Natura 2000 burnt area</li> </ul>
<b>animals</b>	<p><b>affected wildlife:</b></p> <ul style="list-style-type: none"> <li>• Mobile species such as wild boars and roe deer corpses were recovered</li> <li>• At least 107 Hermann tortoise cadavers recovered on a 10.000 population</li> </ul> <p><b>domestic animals:</b></p> <ul style="list-style-type: none"> <li>• Thousands of evacuated horses</li> </ul>	<p><b>affected wildlife:</b></p> <ul style="list-style-type: none"> <li>• Unknown</li> <li>• Migrating stork deaths</li> </ul> <p><b>domestic animals:</b></p> <ul style="list-style-type: none"> <li>• Hundreds left behind in houses/attached</li> <li>• 233 taken in by volunteer veterinarians<sup>3</sup></li> <li>• Pop-up shelter sheltered &gt; 200</li> <li>• 253 horses, 23 ponies, 2 rescued donkeys</li> </ul> <p><b>livestock:</b></p> <ul style="list-style-type: none"> <li>• 44 dead goats on Evia</li> </ul>	<p>October:</p> <ul style="list-style-type: none"> <li>• Thousands of animal deaths (APMVEAC)</li> <li>• 5.398 sheep,</li> <li>• 1.091 pigs and 881 cows died</li> <li>• 500.000 bird deaths</li> </ul>
<b>costs</b>	Assured assets: €100 million	Unknown	Unknown
<b>observations</b>	<ul style="list-style-type: none"> <li>• Largest fire of the year and most extended fire in mainland France in the last 31 years</li> <li>• A full assessment of the damage to wildlife and biodiversity has been requested</li> <li>• It is believed that several domestic animals also perished</li> <li>• Solidarity was observed between citizens, equestrian centres, volunteers and animals</li> </ul>	<ul style="list-style-type: none"> <li>• Worst wave of wildfires since 2007</li> <li>• First time ANIMA finds so many dead storks in Athens<sup>4</sup></li> <li>• Pop-up shelters treated displaced/injured animals</li> <li>• Rescue operation by volunteers for hundreds of pets left behind</li> <li>• Citizens in favour of new plans including animals</li> <li>• Apology of Prime Minister for failures in tackling wildfires</li> </ul>	<ul style="list-style-type: none"> <li>• One of the most heavily forested European country</li> <li>• Flammable eucalyptus trees</li> <li>• June: 2018 farmers affected (€21 million)</li> <li>• October: APMVEAC launched a fundraising campaign because lack of adequate animal feed</li> </ul>

**“half of the Plaine de Maures nature reserve has been devastated. it’s a disaster because it’s one of the last places where the endangered Hermann tortoise lives.”**

**“I had over 300 animals. I lost about 44. they died in the fire. and some 40 others were wounded. the ones that came over to this side, it was really windy so they burned to death. how can I not love them? I’ve had them since they were babies. I raised them, and now they need help.”**

**“this tragedy reached many animals and we intend to avoid more losses providing all the support and help that is within our reach. this situation demonstrates the need to start thinking about procedures that facilitate the process of helping animals in cases of disaster, since nothing is currently provided for in this area.”**

The deputy director of the ‘French Office of Biodiversity’ (OFB), Concha Agero, raised the alarm for biodiversity.<sup>6</sup>

Shepherd Giannis Tsiboukas confronts the ‘total destruction’ caused after a wildfire ravaged his land and half of the island of Evia in Greece. Tsiboukas lost 44 goats in the wildfire, nearly 1/6<sup>th</sup> of his herd, with 40 additional injured animals.<sup>7</sup>

Jorge Cid, President of the ‘Order of Veterinarians’ (OMV) in Portugal stated this after the June 2017 Pedrogao Grande wildfire.<sup>8</sup>

- 
- 1 <https://www.lemonde.fr>  
<https://france3-regions.francetvinfo.fr>  
<https://www.bfmtv.com>  
<https://www.meteo-paris.com>  
<https://www.argusdelassurance.com>  
<https://www.varmatin.com>
  - 2 <https://www.bbc.com>  
<https://www.preventionweb.net>  
<https://news.trust.org>  
<https://www.dw.com/en>  
<https://www.theguardian.com>  
<https://www.keeptalkinggreece.com>  
<https://www.reuters.com/world>  
<https://www.reuters.com/business>
  - 3 <https://www.france24.com>
  - 4 <https://www.wild-anima.gr>
  - 5 <https://www.bbc.com>  
<https://www.bbc.com/news/world-europe-44438505>  
<https://svk-asmpa.ch>  
<https://www.veterinaria-actual.pt>
  - 6 <https://www.francebleu.fr>
  - 7 <https://www.youtube.com>
  - 8 <https://ionline.sapo.pt>



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## wildfire risk in Europe

In recent years, forest fires have affected parts of central and northern Europe not typically prone to fires. In 2018, more European countries suffered large fires than ever before, coinciding with record droughts and heatwaves.<sup>1</sup> Wild animals are very vulnerable, especially young or slow animals who cannot escape quickly enough during fast-moving fires. Furthermore, wildlife escape routes are sometimes blocked by onlookers or fire fighting forces. Without means of escape, livestock and pets are also at risk.

An expansion of areas at fire risk and longer fire seasons are projected in most European regions, so additional adaptation measures are needed.<sup>2</sup> Improved fire prevention and suppression can considerably diminish wildfire risks, while cooperation between various wildfire control actors is crucial for efficiency during a crisis. Discussions on prevention, complications posed by animals in disasters and disaster response are ongoing.

▲ Forest fire near houses in Portugal.

## some of the European wildfire disasters in recent years



### ● **Balkans** (2017)

The Balkan region was particularly affected by a series of devastating fires in 2017. In Croatia, a catastrophic fire season resulted in more than seven times the average burnt area of the previous decade. In Bosnia-Herzegovina and Albania the total area – mainly forest – consumed by the raging fires was higher than the previous four years combined.<sup>3</sup>

### ● **Greece** (2018)

The second deadliest wildfire event this century resulted from a series of forest fires in the coastal Attica region around Athens in July 2018 (102 human deaths, 187 injured people, numerous animal victims). One NGO, *Dogs' Voice*, rescued 530 animals. Since then, the organisation has advocated for the establishment of a state protection authority for animals and formal state protocols for dealing with animal victims of natural disasters.<sup>6</sup>

### ● **Germany** (2019)

Extensive pine forests on poor sites in dry climates are an important vegetative feature of fire-prone areas. Due to these characteristics, Brandenburg is considered the federal state most endangered by forest fire. With hundreds of fires every year on average, the state frequently operates under a Level 5 fire warning. High risk areas in the state include nature parks and biosphere reserves, which host endangered species.<sup>4</sup>

A State of Emergency was declared in Brandenburg in 2019 when municipal fire brigades could no longer cope with wildfires in Jüteborg.<sup>5</sup>

### ● **Netherlands** (2020)

A long period of drought, strong winds and large amounts of dry fuel ignited a series of wildfires in April 2020, including the largest fire ever in the Deurnese Peel nature park, burning 700–800 hectares of

valuable habitat. Fire risk is particularly high in the Netherlands due to extensive natural areas combined with high population density and intensive use (recreation, military training, habitation). Specialist teams are being trained to handle the growing number of wildfires.<sup>7</sup>

<sup>1</sup> European Environmental Agency: CLIM 035 (30 Jun 2021)

<sup>2</sup> European Environmental Agency: CLIM 035 (30 Jun 2021)

<sup>3</sup> <https://publications.jrc.ec.europa.eu/repository/handle/JRC11456>

<sup>4</sup> [https://effis-gwis-cms.s3-eu-west-1.amazonaws.com/effis/reports-and-publications/annual-fire-reports/Annual\\_Report\\_2017\\_final\\_print\\_images\\_updated.pdf](https://effis-gwis-cms.s3-eu-west-1.amazonaws.com/effis/reports-and-publications/annual-fire-reports/Annual_Report_2017_final_print_images_updated.pdf)

<sup>5</sup> <https://www.faz.net>

<sup>6</sup> <https://www.ekathimerini.com>

<sup>7</sup> <https://www.ed.nl>



## veterinary care and help for other animals

Due to the lengthy drought preceding this disaster, animal care facilities were typically at or near full capacity even before the fires began, meaning that resources and space for new victims was extremely limited. Assisting [Friends of the Koala](#), IFAW-sponsored veterinary nurses and IFAW-sponsored and contracted wildlife veterinarians joined the team and provided medical care and treatment at a number of triage clinics along the east coast. While koalas were the highest profile animals in the news, other wildlife (kangaroos, wombats, possums, flying foxes, birds, etc) were also badly impacted by the fires, prolonged drought, heat stress, and loss of habitat. IFAW supported a network of flying fox carers to save the pollinating species by supplying tons of fresh fruit, care supplies, and enclosures where the youngsters could safely learn to fly.

# ifaw interventions

## Australia: bushfires<sup>1</sup>

In Australia, bushfires are a frequent occurrence and, to some extent, a natural phenomenon. Due to eucalyptus-dominated forests, Eastern Australia is one of the most fire-prone regions in the world. In recent years these events have become more frequent, wider and more destructive. Such “megafires” sometimes expand to areas where fire rarely occurs naturally and where ecosystems are not fire-adapted. During 2019–2020, also known as “Black Summer,” Australia experienced the worst bushfire season ever recorded in its history. For 10 months of prolonged drought the fires grew, eventually burning more than 18 million hectares including 12.6 million hectares of forest and bushland.

The worst affected region, New South Wales, reported 5.3 million hectares destroyed, and a devastating loss of the koala population.<sup>2</sup> Koalas are slow-moving animals and spend most of their time high in eucalyptus trees, which would normally be a safe shelter, but the raging fires tore through the crowns of the trees, sparing few: 6.382 koalas perished.

### search and rescue

Koala survivors (including many young orphans) and other species needed urgent rescue and treatment for smoke inhalation, dehydration and burns. IFAW’s Wildlife Rescue vehicle was deployed in a search and rescue effort with Bear, the USC x IFAW koala detection dog that is able to locate the unique scent of koala fur. **Using thermal imaging drones and Bear’s skills, the team found over 100 koalas in bushfire grounds between November 2019 and April 2020.** They were brought to rehabilitation facilities like [Friends of the Koala](#), whose staff were caring for as many as 41 individuals at one time during the height of the rescue efforts.

### recovery and restoration

In addition, IFAW facilitated the installation of over 120 wildlife water stations in the trees and on the ground for animals in drought-stricken areas across New South Wales. Wildlife also needs a “wild” to return to. IFAW continued its work restoring a vital wildlife corridor in New South Wales with eucalyptus saplings, in partnership with [Bangalow Koalas](#) and private landowners. **Our joint goal is to plant 250.000 trees by 2025 to restore connectivity across a patchwork of private land and provide a safe refuge for koalas and other wildlife in the region.**

▲ Detection dogs can help find surviving and injured wildlife after wildfires such as in Australia.



## Haiti: earthquakes and ARCH coalition

Located on major tectonic fault lines and hit every year during the Caribbean hurricane season, Haiti is a nation under near-constant threat, as evidenced by the magnitude 7 and 7.2 earthquakes respectively in 2010 and 2021. Both generated a massive humanitarian crisis. In addition, many domestic pets, stray dogs and cats, native wildlife and millions of head of livestock were adversely affected by the event. In 2010, the **World Society for the Protection of Animals (WSPA) and IFAW partnered to create and lead the Animal Relief Coalition for Haiti (ARCH)**. ARCH eventually helped more than 68.000 animals<sup>3</sup> by delivering, among others, a highly effective rabies and anthrax vaccination campaign among the stray animal population, thereby protecting the wider (human) public from epidemics. Beyond this critical inoculation from zoonotic diseases, ARCH also offered vital support to protect livestock upon which the country's citizens depend. In 2021, IFAW set up several veterinary care stations in the Les Cayes area, the hardest-hit area and other locations, which benefited 5.367 animals right after the event. Weeks after, IFAW pursued its work in other areas, enabling the care of 15.000 animals.

## Myanmar: Safeland disaster risk reduction<sup>4</sup>

Myanmar is located in the monsoon region of Southeastern Asia, where flooding and cyclones are common, especially during the annual rainy season of June through September. In 2008, cyclone Nargis, the worst natural disaster in the country's recorded history, killed more than 136.000 people and threw a harsh spotlight on deficiencies in governmental disaster preparedness plans. Agriculture is Myanmar's main industry and cows are used in traditional farming for rice production, but because of their size cannot use stilted refuge structures to stay above the waterline during flood events. The loss of cattle can have devastating effects on entire communities and local economies.

Such was the case seven years after Nargis, in 2015, when record flooding hit regions across the country again. As an immediate response, IFAW partnered with **Giving a Future Animal Aid (GAF)**, a non-profit animal welfare organisation, but also the **Myanmar Veterinary Association (MVA)** and the **Livestock, Breeding and Veterinary Department (LBVD)** to assist farmers in the Ayeyarwady region with emergency veterinary care and supplemental fodder. Then, IFAW and LBVD, developed a

pilot project in Ingapu township, the most damaged area of the Hinthada district. The team supported the local community in forming an Animal Disaster Risk Reduction Committee and in building, from January to June 2016, an earthen platform, design-improved in 2017, where cows could take refuge during floods. Named 'Safeland', the project was adopted by LBVD and expanded in 2018 to other areas.

**The success of IFAW's community-led Safeland project influenced disaster management officials to invest in preparedness.** Between 2018 and 2020, LBVD budgeted for and completed seven Safeland projects in townships throughout the Ayeyarwady region. As a result of this collaboration, farmers feel secure knowing that they can keep their cows safe in future floods. From June 2019 to June 2020, one Safeland platform in Myanmar provided safe refuge for 175 cattle during flooding. Evacuation of the cattle by boat would have cost the community a significant amount that can instead be saved and invested in other aspects of the community.

▲ IFAW helps local communities to develop plans to be prepared when disaster strikes. In Myanmar we helped to plan and build safe locations for livestock.

- 1 It is important to note that a secondary event following a primary event can quickly lead to a snowball effect, complicating an already difficult situation. The prolonged drought (primary event) prior to the fires (secondary event) was a huge factor in the impact. Every carer and facility was already almost at full capacity when the fires started, pushing them all over-capacity immediately.
- 2 <https://www.ifaw.org/international/resources/koala-conservation-status-new-south-wales>
- 3 IFAW report on Haiti <https://www.prnewswire.com/news-releases/ifaw-wspa-and-other-groups-band-together-to-help-animals-in-haiti-81700622.html>
- 4 IFAW report on Myanmar Safeland project: [https://d1jyxxz9imt9yb.cloudfront.net/resource/225/attachment/original/IFAW\\_SDG-animals-human-wellbeing-report.pdf](https://d1jyxxz9imt9yb.cloudfront.net/resource/225/attachment/original/IFAW_SDG-animals-human-wellbeing-report.pdf)

# timeline – interventions in Europe

## 2007 fire - Greece

In October 2007, IFAW went to Greece to help with recovery from disastrous fires that killed livestock and pets.

## 2010 volcano - Iceland

In April 2010, after the Eyjafjallajökull volcano erupted, hundreds of horses and other farm animals were exposed to clouds of ash for several days, causing health complications and even the death of numerous animals. IFAW rushed to the scene and worked as a consultant for the Veterinary Authority and the Department of Agriculture.<sup>1</sup>

## 2018 training - Italy

IFAW and OIE partnered on a first workshop for Balkan countries on the role of Veterinary Services (VS) to insure animal welfare in natural disasters. A stepwise pilot approach on disaster preparedness was developed, with the main objective of building a culture of preparedness in order to ensure appropriate livestock, wildlife and companion animal welfare measures during and after natural disasters.<sup>4</sup>

## 2019 training - Serbia

Animal Rescue Serbia (ARS) contacted IFAW after facing a severe flood. IFAW organised a training in Belgrade for ARS and human rescue agencies – the first of its kind in the country – focusing on human/animal rescue operations in floods. The IFAW training prepared participants in disaster management, building local communities throughout the disaster cycle, and specializing in water rescue practices for both humans and animals. ARS has established a network of trained responders throughout the country and is formally assisting the government to develop policies for animals in disasters.<sup>5</sup>

## 2021 floods - Central Europe

In July, Germany, Belgium and the Netherlands experienced exceptional floods. IFAW offered an emergency grant to Tierrettung Essen for a quad bike (ATV) for them to access remote areas and rescue impacted animals.

## 2021 fire - France

In August 2021, South-East France was hit by the largest fire of the year and most extended fire in mainland France in the last 31 years. IFAW jumped in to help and granted the SOPTOM to support the rescue of the Hermann tortoise, an endangered European species.

## 2021 training - virtual

In November, the final regional workshop was aimed at testing and validating the Balkan countries' VS-contingency plans for animal welfare management during a natural disaster.



## 2014 floods - Bosnia and Herzegovina & Croatia

Hit with the worst rainfall in more than 100 years, the region suffered deadly floods and mudslides. IFAW assisted over 1.000 animals, providing several weeks' worth of food, and emergency medical care, but also forged partnerships and organised stakeholder workshops in Bosnia.<sup>2</sup>

## 2015 training - Belgium

IFAW and OIE supported a conference in Brussels organised by the Federation of Veterinarians of Europe (FVE) and the European Commission. It focused on preparedness and management of crises, and addressed impacts to animals and the environment as critical factors for human health and well-being. A core takeaway was that civil protection mechanisms must consider interactions between human and animal in order to ensure a successful response to disasters.<sup>3</sup>

## 2019 training - Bosnia and Herzegovina

IFAW and OIE partnered on a second regional workshop on veterinary preparedness in natural disasters in Sarajevo. The objective was to assist the Veterinary Services of Balkan countries to build, step by step, their veterinary services country preparedness (VS-CP) for animal welfare in natural disaster situation (using as an example the flooding scenario) to review initial drafts of the VS contingency plans.<sup>6</sup>

## 2020 earthquake - Bosnia and Herzegovina & Croatia

IFAW provided aid and support to local animal rescue organisations amidst dropping temperatures and limited local resources. Emergency grants to defray veterinary costs and the purchase and distribution of animal food were provided, and IFAW also purchased three microchip readers for search and rescue teams to use in the field.<sup>7</sup>

1 <https://www.instagram.com/p/kSVdU2Rewi>

2 IFAW report 2014  
<https://d1jyxxz9imt9yb.cloudfront.net/resource/70/attachment/regular/ifaw-annual-report-2014-us.pdf>

3 <https://vet-magazin.at/veterinaer-nachrichten-international/organisationen/organisation-f-federation-veterinarians-europe-FVE/Natural-disasters-and-One-Health.html>  
[https://fve.org/cms/wp-content/uploads/Conclusions\\_FINAL.pdf](https://fve.org/cms/wp-content/uploads/Conclusions_FINAL.pdf)

4 [https://awp.oie.int/fileadmin/upload-activities/upload\\_disaster/dmaw\\_b1/dmaw\\_b1\\_teramo\\_report\\_vfinal.pdf](https://awp.oie.int/fileadmin/upload-activities/upload_disaster/dmaw_b1/dmaw_b1_teramo_report_vfinal.pdf)

5 <https://www.ifaw.org/international/campaigns/impact-during-a-pandemic>

6 <https://rr-europe.oie.int/en/events/third-oie-regional-workshop-on-the-role-of-veterinary-services-on-animal-welfare-in-natural-disasters-for-balkan-countries>

7 <https://www.ifaw.org/international/news/aid-animals-croatia-earthquake>



# what can be done

“All disasters are local” is a mantra of responders. But the keys to minimizing damage are evident at every rung of the social spectrum: in our homes, our communities, and at every level of government. And, on a global level, we can reduce the amplifying effects of climate change by reducing greenhouse gas emissions. The [EU Adaptation Strategy](#) (2013) in describing choices about land use, notes that these decisions “are influenced not only by the biophysical environment, but also by markets, laws, technology, politics, perceptions, and culture”.<sup>1</sup> The same can be said for other decisions that affect our ability to mitigate and respond to natural disasters. We must use all the tools at hand. Solutions can be categorised in four main groups:

- **infrastructure and land use**
- **preparedness and training**
- **emergency response systems**
- **funding**

## infrastructure and land use

No weather or geophysical event is truly preventable, barring some miraculous technological innovations in the years ahead. We can, however, take steps to create landscapes and build environments that are more resilient and less prone to the worst effects of a disaster. The design and characteristics of urban fabric – the built and the “green environment” – are important determinants of a city’s resilience or vulnerability to hazardous events.<sup>2</sup>

## ecosystem-based disaster risk reduction

At the intersection of disaster risk reduction, climate adaptation, and ecosystem management lies the field of [Ecosystem-Based Disaster Risk Reduction](#) (Eco-DRR).<sup>3</sup> Ecosystems, like life itself, adapt over time to suit their physical circumstances. And while it is a truism that plants and animals only exist where they can exist, it is

instructive to look at how nature has ordered itself over millennia, to examine how landscapes bounce back and regenerate, as we strive to create sustainable long-term settlements.

In Europe, natural riparian floodplains once meandered freely across wide stretches of the landscape, but today those areas – and the rivers’ freedom to shift and swell – have largely been boxed in by development: In Germany, 80% of the original floodplains are gone<sup>4</sup> while in France, 17 million people (and 9 million jobs) are located in flood-prone areas.<sup>5</sup>

A floodplain is a flat area of land adjacent to a river that experiences flooding during periods of high-water discharge. They provide a natural and crucial protection against the worst impacts of extreme floods. Water is stored in the landscape during high-water discharge and released back into the river in dry times. The best flood protection – in the floodplain and downstream – is therefore not to build in these areas.<sup>6</sup>

## prevention and preparation are key to face future disasters

Since the Elbe flood in 2013, many plans of dike elevations in order to maintain additional water masses are taking place throughout Germany. In the Netherlands too, plans to restore floodplains have been implemented after floods occurred in the 90s. In many places, the dikes were not strong enough, putting them in danger of collapse. In 1993, about 8% (18.000 ha) of the province of Limburg was under water and the un-diked villages of Borgharen and Itteren, among others, were flooded. Some 12.000 people had to be evacuated. These villages were also badly affected in 1995. In the Gelderland river area, 250.000 people and 1 million animals were evacuated as a precaution. In the years that followed, the riverside dikes were strengthened at an accelerated rate and new dikes were also constructed along the Meuse, while the Rhine branches and the Maas also had to be engineered to allow the discharge of larger quantities of water. This tightening of safety levels marked a new approach to high water in our rivers: giving them more space and reinstating floodplains and other natural water storage structures.<sup>7</sup>

Preserving large-scale native habitats should always be our priority, not least because of these lands' importance to wildlife and, often in the case of such habitats as forest and grassland, greenhouse gas absorption. Where this is impossible (i.e., in already-urbanized settings), development must account for the ecosystem services, such as flood control, that the natural environment provides.

We cannot replicate the complex structure of a mangrove forest or wetland in a densely developed area, but investing in permeable pavements, green space, and other water-retentive practices can help to reduce runoff and make urban environments safer during a high-precipitation event. In more suitable regions, these systems might help (re)create habitats for floodplain fauna and flora. Where possible, land already developed should be evaluated for conversion to a more natural state – for example, in active floodplains or wildfire zones where high insurance premiums (or where coverage is impossible) make rebuilding an unattractive option, and where buy-outs, re-zoning, or (in cautious application) exercise of eminent domain may be worth considering. Beyond urban sprawl and settlement issues, industrial and agricultural methods are an important part of landscape level planning. Authorities should take steps to ensure that mining, livestock grazing, timber harvesting, warehouse buildings, renewable energy infrastructure and other activities are conducted according to the highest possible environmental standards so as not to degrade soil and ecosystem resilience. The costliest natural disaster of 2013, the Elbe flood, was set in motion by heavy agricultural use of the soil and increasing urbanisation of the river's banks.<sup>8</sup> Modelling and research can help us understand an area's specific ecological context – both historical and projected – and help to minimise such mistakes in the future through proper land use and land cover decisions.

The increase of scorching summer wildfires throughout Europe also underlines the crucial importance of proper farming practices. The abandonment of traditional rural practices (livestock grazing systems, firewood collection, etc) has led to the accumulation of dry vegetation and shrubs, which results in elevated wildfire risk.<sup>9</sup> We can turn back the clock, however. If adequately managed, grazing can help in the fight against wildfires by

restoring the ecological equilibrium maintained by the wild relatives of livestock. Research indicates that grazing can alter the landscape enough to slow the advance of a wildfire and shorten the length of its flames, both keys to reducing a fire's overall strength. In Spain, sheep and goat herds are set out in key areas of the forest determined as being at high risk of wildfires. Usually native and well-adapted to the region's vegetation, the livestock feed on a variety of shrubs that would otherwise be the future fuel of fires. Federal and state governments should incentivize such practices and fund a great deal more research and development of agricultural and forestry systems that are resilient to floods, storms and wildfires.<sup>10</sup>

◀ An IFAW responder conducts an animal search and rescue assignment in the aftermath of Hurricane Dorian.

1 <https://climate-adapt.eea.europa.eu/about/climate-adapt-strategy-2022-2024-final.pdf>

2 <https://op.europa.eu/en/publication-detail/-/publication/285d038f-b543-11e7-837e-01aa75ed71a1/language-en>

3 <https://www.iucn.org/news/thailand/201706/advancing-ecosystem-based-disaster-risk-reduction-sustainable-development>

4 <https://www.wwf.de/themen-projekte/fluesse-seen/hochwasser/hochwasser>

5 <https://halshs.archives-ouvertes.fr/halshs-01981420/document>

6 <https://www.wwf.de/themen-projekte/fluesse-seen/hochwasser/hochwasser>

7 <https://www.rijkswaterstaat.nl/water/waterbeheer/bescherming-tegen-het-water/maatregelen-om-overstromingen-te-voorkomen/ruimte-voor-de-rivieren>

8 [https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/uba\\_hochwasser\\_barrierefrei\\_new.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/uba_hochwasser_barrierefrei_new.pdf)

9 <http://www.efncp.org/projects/projects-spain-navarra/wildfire-prevention>

10 <https://iforest.sisef.org/contents/?id=ifor1112-007>



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## disaster-resilient construction methods

Historically, cities and towns have tended to proliferate along rivers and coasts. They often serve as natural borders between countries, and an **estimated 20% of the European population (115 million people) live within 50 km of a border.**<sup>1</sup> This puts companion animals and livestock – by definition, animals that share space with humans – at particular risk of riverine flooding. Disaster-resistant design principles should be incorporated into construction codes and voluntarily adopted by builders, whether for new structures, renovations, or repairs. And when an extreme weather event, earthquake, or other catastrophe causes structural damage, those lessons should be deployed in the rebuilding phase.

## safe havens

As different areas around Europe become exposed to new or higher-frequency/higher-intensity extreme weather events, it will be vital to build accessible areas of refuge for humans and animals. In other regions of the world, areas of refuge (in contrast to longer-term shelters) are intended for short-term use during an emergency, such as a hardened secure room that can protect occupants from a tornado. IFAW has field-tested landscape modifications that serve this function in other countries. During Myanmar's particularly devastating 2015 monsoon season, many livestock drowned for lack of higher elevation refuges. The earthen platforms built in the Hinthada district, an area where villages are dangerously situated between two rivers, allowed animals to find temporary safe havens, preserving a key cog in the subsistence of the villages.<sup>2</sup> **Not every area of refuge is right for every type of disaster, so it is important to have redundancies and to plan ahead for the changing geophysical context of each region.**

## settlement planning

Recent years have given plenty of stark examples proving that where we build matters more than how we build. Damage caused by floods can be reduced primarily through changes in settlement development. Firstly, in principle, no new building areas should be designated in already established floodplains. This could yet be the most effective way to avoid extensive damage to buildings during floods.<sup>3</sup> Likewise, we should take care to carefully consider development in fire-prone areas, as the obvious allure of a community surrounded by woodlands elides the fact that these same trees are fuel, under the wrong conditions. Meanwhile, preventive techniques that work in more remote areas, such as controlled burns, are often not an option closer to developed areas, leading to the accumulation over time of flammable undergrowth.

# impacts of extreme weather and climate-related events

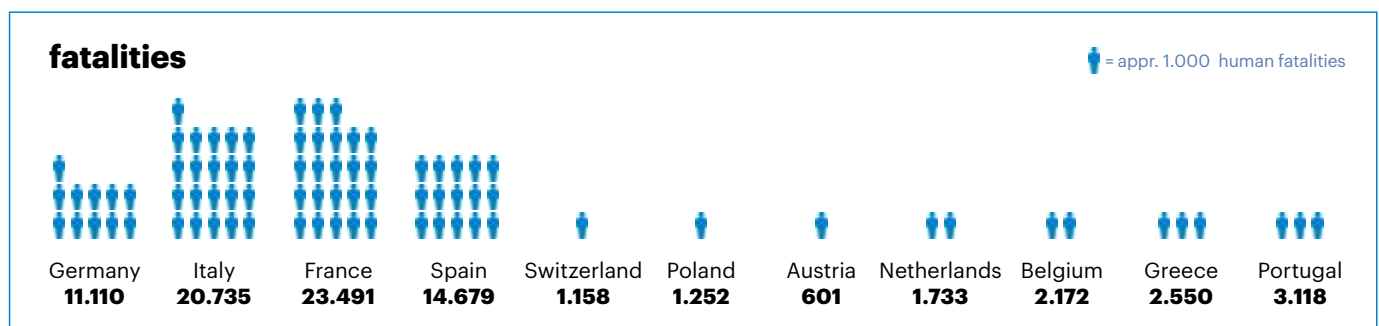
(in the EEA\* member countries and the UK / 1980–2019)\*\*

## losses

country	losses (millions of euros)	insured losses (millions of euros)	insured losses (= %)
Germany	107.445	51.235	48
Italy	72.534	3.439	5
France	67.524	33.503	50
Spain	45.329	11.681	26
Switzerland	19.108	9.831	51
Poland	15.966	1.058	7
Austria	15.415	5.010	33
Netherlands	9.205	4.433	48
Belgium	5.000	3.002	60
Greece	7.689	148	2
Portugal	7.591	650	9

\* European Economic Area

\*\* <https://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-4/assessment>



Authorities can help minimise future damage by incentivizing urban density instead of sprawl (with consideration given to the urban heat island effect and permeability), giving low-income families safer housing options, and strictly examining new development according to climate models that more accurately predict the “new normal” (rather than continuing to rely on outdated planning tools). Location matters above all.

**If we build in fire-prone areas, homes will burn. If we build in floodplains and near shorelines, homes will flood. If we build on deforested hillsides, mudslides will happen.**

◀ Animal Rescue workers from Tierrettung Essen save ponies during the floods in the Ahr Valley in Germany, 2021.

<sup>1</sup> [https://www.dkkv.org/fileadmin/user\\_upload/Veroeffentlichungen/Publikationen/ESPRESSO\\_2018\\_Comparison\\_of\\_national\\_strategies\\_in\\_France\\_Germany\\_and\\_Switzerland\\_for\\_DRR\\_and\\_cross-border\\_crisis\\_management.pdf](https://www.dkkv.org/fileadmin/user_upload/Veroeffentlichungen/Publikationen/ESPRESSO_2018_Comparison_of_national_strategies_in_France_Germany_and_Switzerland_for_DRR_and_cross-border_crisis_management.pdf)

<sup>2</sup> <https://www.ifaw.org/international/projects/safelands-project-myanmar>

<sup>3</sup> Umwelt Bundesamt, 2011

# preparedness and training

In Europe, there are only few regulations or emergency operation plans covering animal evacuation at the moment. Such laws and regulations are necessary first steps, and all states should have them in place by now. As the boxer Mike Tyson famously said, “Everybody has a plan until they get punched in the mouth”.<sup>1</sup> **What differentiates a successful disaster response from a fiasco usually isn't the plan itself, but the amount of practice** that goes into each element, from establishing trust between government agencies and other stakeholders, to executing search and rescue operations in difficult conditions. Most of these are things that we can train for, and when nature lands its punch, we will be better conditioned to respond effectively.



© IFAW/Jennifer Miller

▲ IFAW's rescue team, along with the newly partnered Cape Cod Stranding Network team (CCSN) completed a Zodiac boat operations training on Cape Cod, Massachusetts. The two day training emphasized risk assessment, safety, boating maneuvering, motor operations and navigation and physical rescue techniques.

## Policy making

IFAW recognizes the impact of policy in establishing a framework for addressing animals in disasters. We urge the European Commission and national governments to include animal welfare as part of a societal response to emergencies and disasters. Guidance should be provided to Member States on the correct management provisions for animals and the people supported by them to protect citizen livelihoods and wellbeing in the aftermath of extreme events. These measures would help support the impact of civil emergency management, which currently lacks the inclusion of animal welfare into contingency planning.

There is a humanitarian benefit of the inclusion of animal welfare into disaster management. Evidence is established on the livelihood, wider economic, health and well-being benefits of early-stage intervention for animals in disasters and the subsequent benefits to communities recovering from disasters. Many humanitarian actors are adopting this approach, but funding falls far behind that of other modes of disaster intervention. With the inclusion of animal welfare into disaster management, [DG ECHO](#) funding for disaster preparedness and response could be extended to support capacity building and other preparedness and management measures.

The inclusion of animal welfare into the European Commission's priorities for disaster management provides the right opportunity to ensure alignment and delivery upon [OIE Guidelines for Disaster Management](#) and the [Sendai Framework for Disaster Risk Reduction](#). IFAW believes that without this provision, it will be impossible for the Commission to deliver upon the Sustainable Development Goals fully.

IFAW recommends the inclusion of animal welfare into disaster management in the EU, and within EU funding via the following principles:

1. Improving the knowledge of animals' needs in emergencies and improving officials' skills to manage and respond to these issues.
2. Provision of resources to handle animal welfare in an integrated manner within humanitarian emergencies, both for EU Member States and humanitarian crisis response efforts outside the EU.
3. Improved recognition and communication of the need to protect animals when the dependency between them and people is high.
4. Clear allocation of responsibility for animal welfare in emergencies.
5. Integration of animal welfare into emergency management.
6. Better organisation of the farming sector and municipalities with emergency planners to improve disaster management.

## MOUs

IFAW operates on an “invitation-only” basis, wherein a federal, state, or municipal agency must request help through a formal request as part of their incident command structure. [Memoranda of Understanding \(MOUs\)](#) are the means by which we establish preliminary guidelines and expectations for this relationship and help to build a record of collaboration between these agencies and our team, so that quick intervention is possible when time is most valuable. Over decades of service, IFAW has signed MOUs with [Authorities Having Jurisdiction \(AHJ\)](#) in several countries and will hopefully do so in Europe soon.



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### **Overhead disaster management**

Knowledge is power, and the most-requested item in IFAW's toolbox is our subject matter expertise on how communities can best implement disaster management strategies. This encompasses a risk/gap analysis tailored to specific local or regional risks, a look at the resources available (for instance, NGOs that serve the area's animals and/or public health), pertinent legislation or regulations, and much more.

### **Training programs**

IFAW endeavours to provide disaster-specific and culturally relevant training, and we employ team members to educate responders in a wide array of skill sets: logistics, planning, and

overhead management, animal care and control, veterinary care, crisis communication, and technical animal search and rescue, among others.

### **Coordination plans**

There are authorities at every level responsible for the care and control of animals in the European Union, but a pervasive problem is that these authorities have few methods for planning and working together. This results in huge gaps in information and on-the-ground efficacy during a disaster. States, municipalities, and federal agencies need to invest more time and resources into developing communications and coordination elements that can be incorporated into overall disaster response plans.

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▲ Rescued dog, Panda, receives a bath to treat her irritated skin during IFAW's deployment to the North Complex Fire in Butte County in California, U.S..

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<sup>1</sup> <https://quotepark.com/quotes/1834341-mike-tyson-everybody-has-plans-until-they-get-hit>



## emergency response systems

Once a flood, wildfire, or earthquake hits, it is essential that capacity exists to implement plans.

### **National ministries of agriculture**

These authorities should work to provide an extensive description of best practices on such topics as animal decontamination, evacuation, sheltering, veterinary care, and more. We strongly encourage planners to make use of these valuable resources.

### **Animal search and rescue (ASAR)**

Trained responders from NGOs and government agencies can make a huge impact in the immediate fallout from a disaster. These professionals locate and extract trapped or imperilled animals, and often can stabilise the animal for transport to veterinary care.

### **Animal intake**

Animals brought to a rescue or shelter facility during a disaster may be experiencing severe psychological or physical distress, and if injured, contaminated or aggressive, may pose a danger to themselves or others. It is imperative that handlers are equipped with the necessary skills and tools, including personal protection equipment, to deal with a variety of species and situations. Wherever possible, shelter operators and search and rescue specialists should use standardised tracking and identification systems in order to protect the identity of the animals in their care.

### **Supply chain and systems**

Built-in redundancies can sharply reduce the risks posed by the loss of critical equipment like medical supplies and communications technology. Response plans should also ensure that caches of these materials are available at numerous sites in and near disaster-prone areas. The same principle applies to the systems that underlie a response; as the

National Institute of Building Science stresses, “In evaluating required critical infrastructure needs, a balance must be struck between on-site (stand-alone) resilience, and off-site (community-based) resilience needed to support survivability and post-event response and recovery for each building”.<sup>1</sup> In the animal welfare context, establishing regional shelter networks – where out-of-town or out-of-state animal shelters agree to take in pets and unowned animals displaced by a disaster – can reduce the pressures on responders to find last-minute housing for these animals.

▲ Floodwaters from the Elz river (a tributary of the Rhine) inundate the town center of Monreal in Germany, 2021.



# investment

Even a minor disaster can be wildly expensive, when accounting for deployment of responders, rescue supplies, operating temporary shelters, and myriad other costs.

- a. Disasters can escalate quickly. As can the funding needed to rescue and repair. Independently planning for the unthinkable within household financial budgeting is best practice where possible.
- b. Countries, regions and municipalities should take advantage of rules that allow volunteer services and other donated resources to offset the financial burden of a disaster response effort.<sup>2</sup>
- c. Money influences our decisions about where and how to build. Initiatives like National Flood Insurance and Compensation Programmes should be better structured to disincentivize risky growth in disaster-prone areas. Risk models should be regularly updated to account for the impacts of climate change.
- d. Landscape adaptation projects, done right, can be cost-effective means of mitigating natural disasters and provide numerous co-benefits for people and animals. To the greatest extent possible, disaster prevention funding should be provided for those purposes rather than investing in more “hard” infrastructure.
- e. The [EU Solidarity Fund](#) provides financial aid for livestock owners facing economic losses after a national natural disaster. National emergency programmes, too, usually provide financial aid to livestock owners facing animal losses. These programmes are intended to help stabilize our agricultural systems by defraying the cost burden on livestock farmers, but they also pose a moral hazard: Owners of such



operations may choose to take a pay-out rather than providing for the safety of their animals during a disaster. The government should tie these programme benefits to reasonable preventive standards and require the pre-emptive establishment of animal rescue plans.

- f. By recognising the need for a societal response to animal protection in disasters, [DG ECHO](#) should integrate the benefits of animal protection into its funding mechanisms to enhance cost effectiveness and better outcomes for disaster preparedness planning and response.
- g. We should significantly increase funding of impactful programmes and other government initiatives that protect sensitive land or promote conservation practices on “working lands”.<sup>3</sup> We should also prioritise on-the-ground monitoring of these programmes to ensure compliance by landholders. Research and development of “continuous living cover” crops and systems that increase the resiliency of agricultural lands must be accelerated.<sup>4</sup>

## advice for owners

We all want our pets to be safe from harm, and by taking a few precautions we can give them a better chance to survive a disaster.

1. Microchip your pet and register the information with a national database.
2. Keep an emergency evacuation kit for your pet that includes medications, vaccination records, food and water, and a pet collar with an ID tag.
3. Have a transport and sheltering kennel/carrier on hand.
4. Contact your local emergency management agency for a list of pet-friendly hotels or shelters that allow co-location with animals. Agencies in high-risk disaster zones may also provide pre-registration for residents who need transportation during an emergency evacuation.

▲ A tired and injured kitten receives veterinary treatment during IFAW’s deployment to the North Complex Fire in Butte County in California, U.S..

<sup>1</sup> <https://www.wbdg.org/design-objectives/secure-safe/natural-hazards-mitigation>

<sup>2</sup> [https://www.fema.gov/sites/default/files/2020-07/fema\\_donated-resources-policy\\_2018.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_donated-resources-policy_2018.pdf)

<sup>3</sup> Working lands are those devoted to cropland agriculture, forestry or other semi-natural uses.

<sup>4</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0046>



# conclusion

Animals are inseparable, in so many ways, from our experience of what it means to be a human, and we have a responsibility as owners, guardians and managers of ecosystems. As we prepare for and respond to disasters, the safety and well-being of animals must be a key consideration. Although we seem to be fighting an uphill battle against the forces of nature and societal inertia, many dedicated individuals and organisations like IFAW will continue to provide tireless efforts in this cause.

This report demonstrates how disaster management is an ongoing and many-layered exercise, where it is impossible to fully control outcomes but where there exist countless paths to making a meaningful difference for individuals and communities. These include long-term solutions as landscape

conservation, climate adaptation, joint agency planning, and 'just-in-time' training to quickly and safely expand responder capacity. In Europe, we need to scale up from our personal preparedness measures to functional systems in every stratum of respective governments.

It is up to all of us to provide the funds, laws, but most importantly the will to prepare and respond to disasters, and to do it again and again, year after year, one safe family and one safe animal at a time. Resiliency and planning will save lives. We must be ready.

**disaster management: countless paths to making a meaningful difference for individuals, communities and animals**

▲ Responders carry rescued animals to shelter during IFAW's Hurricane Florence response.

**preparedness,  
resiliency and  
planning**



**safer animals  
before, during  
and following  
a disaster.**

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