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Foreword

Marine Lercier, Tiamat Warda and Eva Bernet Kempers

The 'Animals in Wars and Disasters' Symposium (AWDS), organised by the *Global Research Network's Think Tank* (GRN) *programme* on *Animals and Biodiversity* on 3-4 September 2022*,* marked a significant online success.[1] This event had an impressive lineup of over 25 presenters, including three distinguished keynote speakers.[2] Over the course of two days, it drew a live audience of over 1,000 participants.

The AWDS examined the complex ways in which wars, natural and anthropogenic disasters, and climate change affect animals. It emphasised the critical importance of recognising the unique challenges animals face in such situations, underscoring the principles of equality, compassion, and care that are central to advocating for animal rights. In essence, the AWDS sought to bridge the gap in policy and protection for non-human animals in times of crisis. It called for the recognition of all animals as sentient beings and underscored the need for robust policies reflecting their protection.

The GRN's *programme on Animals and Biodiversity* served as a vital platform for advancing these goals. Its values centre around promoting interspecies justice and the idea of a harmonious society where humans and other animals coexist. It contributes to a deeper understanding of animals and biodiversity by fostering interdisciplinary collaboration and recognising the interconnectedness of various issues and academic fields.

Marine Lercier, Tiamat Warda, and Eva Bernet Kempers are the co-editors of this special issue. Marine Lercier is a PhD candidate in global animal law and a predoctoral researcher at the A*utonomous University of Barcelona*. Her research explores the avenues for granting labour rights to non-human animal workers and conceptualises what she calls 'animal labour law'. Using racehorses as a case study, she identifies and addresses the gaps in protection in this industry, intending to safeguard horses' fundamental interests beyond their racing careers.

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[1] Animals and Biodiversity Think Tank Programme, 'Meet Our Members' (Global Research Network Think Tank) <https://grn.global/animals-biodiversity/> accessed 7 November 2023.

[2] The keynote speakers were Marina Lostal on 'Animals in International Criminal Law: Invisible, Objectified, and Forgotten'; Gerardo Huertas on 'The risk of emergencies for animals'; and Clare Palmer on 'Climate change, wild animals, and ethics.' The full programme and links to the recordings of the live presentations are available here: <https://documentcloud.adobe.com/gsuiteintegration/index.html?state=%7B%22ids%22%3A%5B%221kO1XFuqLMlgsmUyl9VMyxzp776Bzufqa%22%5D%2C%22action%22%3A%22open%22%2C%22userId%22%3A%221150358315743035611 15%22%2C%22resourceKeys%22%3A%7B%7D%7D> accessed 7 November 2023.

Eva Bernet Kempers is a postdoctoral researcher in animal law at the *University of Antwerp* and Junior Research Associate at the *Cambridge Centre for Animal Rights Law*.[3] In her research, she aims to critically assess the role of law in reshaping our relations with non-human animals and nature in the Anthropocene.

Tiamat completed her MA and PhD in anthrozoology (the study of dynamics and relationships between humans and individuals of other species) at the *University of Exeter*. Her aim is to bring together academic research with practitioner expertise to initiate sustainable, regulated, meaningful change for all stakeholders in multispecies workplaces and is working toward emotional labour being recognised as a professional skill.

We, the co-editors, are immensely grateful for the opportunity to collaborate with the *Global Journal of Animal Law* (GJAL) to create this special issue. A heartfelt thank you to the dedicated editors of *GJAL* for their instrumental support in bringing this project to fruition. We also thank Dr. Yoriko Otomo, director of the *Global Research Network Think Thank*, for her efforts to provide an inclusive and diverse academic platform for early-career scholars and for supporting us as former Junior Fellows of the GRN.

Deep appreciation is extended to Professor Irvine from the Department of Sociology at the *University of Colorado Boulder*. It is a great honour that Irvine has contributed an editorial that serves as an introduction to the articles included in this special issue. Irvine's academic contributions are paramount in the study of animals in disaster contexts. Her research is a wake-up call to recognise and address the often-overlooked issues surrounding animals in times of crisis. By illuminating the unique challenges faced by animals in disaster situations, Irvine's work underscores the imperative of safeguarding their welfare and protecting them as an integral aspect of disaster preparedness and response. Irvine's work significantly impacted policy discussions and the development of disaster management strategies, prompting authorities to incorporate provisions for animal welfare in emergency plans.

In this special issue contribution, entitled 'Why Study Animals in Disasters?', Irvine underscores the need to consider the welfare of animals in disaster planning and response, highlighting the intricate, entangled relationships between humans and individuals of other species in the face of disaster. The co-editors are grateful for her valuable participation in this endeavour and anticipate that her expertise will provide a valuable and insightful perspective, further enhancing the discourse on the welfare of animals in the challenging contexts of wars, disasters, and climate and ecological crises.

The co-editors extend their regards to all readers engaging with this special issue and encourage a revisit of the symposium's recorded presentations and blog posts.[4] These supplementary resources provide an opportunity for a more in-depth examination of the multifarious perspectives and scholarship in this area.

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[3] Cambridge Centre for Animal Rights Law, 'About Our Centre' (Cambridge Centre for Animal Rights Law) <https://animalrightslaw.org/ourcentre> accessed 9 November 2023.

[4] Aditya SK, 'Let's help wild animals affected by the Kaziranga floods' (Global Research Network Think Tank, 31 December 2022) <https://grn.global/lets-help-wild-animals-affected-by-the-kaziranga-floods/> accessed 15 November 2023; Harley McDonald-Eckersall, 'What Happens to Animals When the World is on Fire? – Framing Animals as Individuals in Climate Communications' (Global Research Network Think Tank, 7 January 2023) <https://grn.global/what-happens-to-animals-when-the-world-is-on-fire-framing-animals-as-individuals-in-climate-communications/> accessed 15 November 2023; Josh Milburn and Sara Van Goozen, 'Animals and the Ethics of War: A Call for An Inclusive Just War Theory' (Global Research Network Think Tank, 8 December 2022) <https://grn.global/animals-and-the-ethics-of-war-a-call-for-an-inclusive-just-war-theory/> accessed 15 November 2023; Lauren Strumos, 'Religion and Justice in Climate Change' (Global

Sustained engagement and scholarly pursuits in this academic field are instrumental in advancing collective understanding and fostering meaningful change for all animals facing the challenges of wars, disasters, and the climate crisis. This special issue is anticipated to serve as a springboard for future research and discussion. In closing, we extend sincere gratitude to the contributors and readers alike and hope that the diverse and insightful publications within this special issue enrich your intellectual pursuits and provide both enjoyment and inspiration.

Research Network Think Tank, 2023) <https://grn.global/religion-and-justice-in-climate-change/> accessed 15 November 2023; Valentyna Vozna, 'Why should we protect animals in disasters and what can the EU do?' (Global Research Network Think Tank, 25 January 2023) <https://grn.global/why-should-we-protect-animals-in-disasters-and-what-can-the-eu-do-2/> accessed 15 November 2023.

Why Study Animals in Disasters?

Leslie Irvine*

The welfare of animals in disasters has only recently received serious scholarly attention. Both the academic literature and the media have long defined disasters as solely affecting human property and human lives. For example, in 1969, a catastrophic oil spill occurred off the coast of Santa Barbara, California. It was the largest spill in U.S. waters at the time, and the oil killed thousands of birds and countless marine mammals. Yet, the president of Union Oil Company, whose well was responsible for the spill, said in a U.S. Senate hearing, "I don't like to call it a disaster because there has been no loss of human life. I am amazed at the publicity for the loss of a few birds" (Clark and Hemphill 2002:159). Similarly, when millions of animals raised for food died in southern United States during the 2005 hurricane season, the media reported the "losses" suffered by the producers rather than the deaths of sentient beings. As animal activist Miyun Park wrote, "A typical press report reads: 'According to the American Farm Bureau Federation, farmers in southwestern Louisiana were hurt most by Hurricane Rita, which has resulted in the loss of 30,000 cattle and seriously harmed rice fields and the harvest of sugar cane.' The farmers were hurt, but the cattle were merely 'lost.' Serious harm was reserved for the rice fields" (Park 2005). Fortunately, as the articles in this Special Issue indicate, this anthropocentric perspective no longer dominates. The research, which examines topics including Military Working Dogs, wildlife, companion animals, and animals raised for food, attests to a greater awareness that disasters are more-than-human events. Moreover, the research shows that what constitutes a "disaster" has also evolved. It now extends beyond natural hazards to include the consequences of war, climate change, industrialized animal agriculture, and other events and situations.

Although the scholarly literature now recognizes that the impact of disasters goes well beyond the human realm, human lives remain the priority in disaster planning, response, and recovery. This raises the question of why scholars should devote time and effort to studying animal welfare in disasters. I offer two responses to this question. First, we should study animals in disasters because human lives and animal lives are closely connected emotionally, economically, and morally. We rely on animals as companions, commodities, workers, and more. In bringing them into our homes, institutions, and social settings, we make animals vulnerable to various hazards. In what is known as the *vulnerability paradigm*, researchers distinguish hazards, such as hurricanes, floods, wildfires, and attack, from disasters, which result from the coupling of a hazard with other factors, such as the physical setting and the capacity of the population to avoid, respond to, and cope with the

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incident's effects (Bolin and Stanford 1998; Tierney 2006). Among human populations, those with the fewest choices are the most vulnerable to disasters. The poor, minorities, women, the disabled, and the elderly face institutionalized practices of domination and marginalization that restrict their options when faced with natural or technological hazards. Like humans, different categories of animals face different exposure to hazards and are differentially provided opportunities for rescue or escape (Irvine 2009). Although animals are vulnerable in different ways, most have no control over their living conditions. Companion animals are vulnerable to abandonment, injury, and death following disasters, but they are less vulnerable than animals raised in industrialized farms and used in research laboratories. Animals who are locked into cages and dependent on automated systems for food, water, and ventilation, face great risk posed by numerous hazards and have no chance of escape. The lives of chickens, hogs, and cattle only have value if they end in slaughter. Because animals' vulnerability varies by the ways that humans have categorized them, it makes little sense to talk about "animals in disasters" as if they all face the same risk. To assert that animals are vulnerable, one must ask which animals are vulnerable, to what, and how. Thus, scholars who study animals in disasters can understand the risks that exist within the specific context and use that knowledge to make them less vulnerable.

A second response to the question of why it is important to study animal welfare in disasters is related to the first: animal problems are people problems. For example, consider the research on companion animals and evacuation following disasters (DeYoung and Farmer 2021; Farmer, DeYoung, and Wachtendorf 2016; Irvine 2009; Zottarelli 2010). Evacuation saves lives and reduces injuries, and researchers have long investigated how to encourage people to comply with evacuation orders prior to an event (Perry 1979; Perry et al. 2001). Research finds that providing for pets ranks highly on the list of reasons why people choose not to evacuate (Baker 1991; see also Drabek 2001; Whitehead et al. 2000). In one survey, 62 percent of respondents said they would defy orders to evacuate if they could not locate a place that would accommodate their pets (American Kennel Club 2006). Of course, some owners might choose to leave their pets behind or be required—or even forced—to do so (Blendon et al. 2007; Irvine 2009; Petrolia and Bhattacharjee 2010). But leaving animals behind can not only jeopardize animal health (Heath, Voeks, and Glickman 2000; Kajiwara 2020; Mattes 2016); it can also affect human mental health and emotional well-being (Glassey and Wilson 2011; Heath 1999; Trigg et al. 2015; Thompson et al. 2014). Because most pet owners in the United States consider their animals members of the family, losing a pet in a disaster can result in significant psychological distress and trauma (Hunt et al. 2008; Irvine and Andre 2023; Kajiwara 2020). The experience can have considerable impact on children (Travis 2014).

In addition, animals must be evacuated along with people for public safety reasons. Research documents that leaving animals behind creates additional risks to human and animal life (Irvine 2009). Residents will often put themselves at risk by re-entering evacuated areas to rescue their animals. For example, at 5:30 a.m. on March 4, 1996, a train derailed while passing through Weyauwega, Wisconsin (Heath, Voeks, and Glickman 2001). Fifteen of the train's cars carried propane, and five of these cars caught fire. At 7:30 a.m., concerns about potential explosion prompted emergency responders to order the evacuation of Weyauwega's 1022 households. Emergency personnel expected the response to take several hours. Consequently, half of the pet-owning households left their pets behind, believing they would soon return home. However, disasters are unpredictable, and the response took much longer. Shortly after the evacuation, forty percent of pet owners reentered the evacuation zone illegally to rescue their pets. Following protocol, emergency managers prevented residents

from entering their own homes. A group of citizens made a bomb threat on behalf of the animals, which directed negative media attention at the response. Four days after the evacuation, the Emergency Operations Center organized an official pet rescue, supervised by the National Guard using armored vehicles. Thus, "pet ownership can be a significant threat to public and animal safety during disasters" (Heath et al. 2001:664).

In sum, the study of animals in disasters is prompted by the recognition that humans and animals share the built and the natural environment, as well as the accompanying risks. Learning how to reduce the vulnerability of animals is a moral, economic, and emotional imperative. Moreover, reducing the risks animals face can reduce the risks to human lives. We have brought billions of animals into existence to satisfy our pleasures, our needs, and our appetites. It was once inconceivable for people to step outside our position of dominance and ask what moral obligations we have to those animals. However, the tide has begun to turn. Increasingly, animals are no longer regarded as the "other." The articles included in this Special Issue reflect that change and will surely spark further transformations in thought and action.

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Sociozoologic Chronicles: Pantanal Creatures' Narrative Shift from 'Demons' to Adored 'Pets' Through Media's Lens

Eveline Baptistella and Cecília Nobre

Abstract: Considering the media influence, this work studied the representation of animals in the media in the episode of fires in the Brazilian Pantanal biome in 2020. The study analyzed the content of 175 news articles published on the portals UOL and G1 to identify the social roles attributed to the species portrayed and to promote a reflection based on the theory of the Sociozoologic Scale and Critical Animal Studies. Our findings showed a representation of animals that reinforces their subordinate position in relation to humans, assuming the role of victims of the anthropic action. The press depicts nonhuman animals differently, depending on the social position in which they are established. However, there was also evidence of networks of relationships between human and nonhuman animals based on concepts of animal protection, highlighting relationship configurations that aim to preserve species.

Keywords: Animal Representation; Critical Animal Studies; Sociozoologic Scale; Pantanal; Jaguar; Animals and disasters.

1 Introduction

This article aims to discuss the representation of nonhuman animals in the media and reflects on how media narratives impact the hierarchization of species in our society. We analyzed the media coverage of environmental disasters that occurred in the Brazilian Pantanal at the beginning of the decade, especially the forest fires in 2020. Given that this biome serves as both a cultural landscape and habitat for wild, farmed, and domesticated animals, our objective was to analyze the various approaches presented in the news. We also discussed how news characterizes the relationships between human and nonhuman animals in this context. The sample was selected from two of Brazil's main news websites, G1 and UOL, and analyzed employing the content analysis methodology. The theoretical framework used was the one of critical animal studies[1] and the sociozoologic scale[2].

The Brazilian Pantanal is located in the midwest region of Brazil, in the states of Mato Grosso and Mato Grosso do Sul. It is one of the largest wetlands on the planet, with an area of 160,000 km²[3], and one of the best places in the world for the practice of wildlife tourism. Its main ecological characteristic is the "flood pulse", an annual

[1] Margo DeMello, *Animals and Society*: *an introduction to human-animal studies* (Columbia University Press, 2021).
[2] Arnold Arluke and others, *Regarding animals*. (Temple University Press, 2022).
[3] Willian Mitsch and James Gosselink, *Wetlands* (Wiley & Sons, 2015) 77.

system of flood and drought that determines variations in the landscape, and in the spatial distribution of nonhuman animals, favoring encounters between species[4]. Besides tourism, another economic activity developed in the region is cow and buffalo breeding. It is one of the main productive chains and has been in the region for at least 100 years[5]. The two activities coexist in the region but under conflict and tension. In fact, the fires evidenced such a situation, since the Federal Police investigations revealed that at least five ranchers deliberately set fire to the vegetation in order to open pastures[6]. As in all regions with human occupation, the Pantanal has its own pet population, especially dogs and cats. Thus, we have a good starting point to study the hierarchization of nonhuman animals in society and how culture assigns different social roles to certain species.

2 The Good and the Bad or the Submissive and the Defiant? Nonhuman Animals and the Sociozoological Scale

Throughout history, the relationship between human and nonhuman animals in society has unfolded in different shades, going from love to fear, repulsion to admiration, and devotion to exploitation. It is not different in contemporary society. Despite all of the animal rights advances, we still see – in all forms of relationships between species – aspects of anthropocentrism.

According to Thomas (2010)[7], our asymmetric behavior towards other animals is a legacy of modernity, with its ideals of control over nature. This pattern finds new expressions over time and becomes evident in the attribution of hierarchies that define the type of consideration given to nonhuman animals in our daily lives — either through direct coexistence or through the media.

Human societies classify other animals according to perceptions oriented by culture, gender, geographic location, and other criteria[8]. According to Descola[9], humans have more sympathy for those animals they think are closer to their species, and mammals have a better consideration and are at the top of this imaginary

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[4] Eveline Baptistella, *Animais não humanos e humanos no turismo do pantanal mato-grossense: da representação midiática ao encontro, 2020,* Doctoral dissertation (Doctorate in Contemporary Culture Studies), Contemporary Culture Studies Graduate Program, Universidade Federal de Mato Grosso.

[5] Fátima Costa, *A história de um país inexistente: o Pantanal entre os séculos XVI e XVIII* (Estação Liberdade, 1999) 107; J. Franco and others, *Biodiversidade e ocupação humana do Pantanal mato-grossense: conflitos e oportunidades* (Garamond, 2013) 90.

[6] Vinicius Lemos, '*Incêndios no Pantanal: por que o fogo ainda ameaça o ecossistema mesmo após a chegada das chuvas'* (BBC News - Brasil, 7 November 2020) <https://www.bbc.com/portuguese/internacional-54848995#:~:text=%22Os%20atuais%20focos%20de%20calor,alguns%20pontos%20e%20muito%20calor.&text=Levantamentos%20na%20regi%C3%A3o%20apontaram%20que,outubro%2C%20foram%20causados%20pelo%20homem> accessed on 7 October 2022.

[7] Keith Thomas, *O homem e o mundo natural (*Companhia das Letras, 2010) 77

[8] Susana Costa and others, '*Especiessismo – Percepções sociais portuguesas e guineenses sobre os outros'* (2008) *VI Congresso Português de Sociologia* <https://www.researchgate.net/publication/242459300_Especiessismo_-_Percepcoes_sociais_portuguesas_e_guineenses_sobre_os_outros> accessed on 20 November 2022.

[9] Phillipe Descola, '*Estrutura ou sentimento: a relação com o animal na Amazônia' (1998) 4 (1) Mana*, 23, 45 <https://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-93131998000100002> accessed on 7 November 2022.

hierarchy. Leach[10] also sees mammals at the top of this “pyramid,” but establishes a social distance criterion. He states that domesticated and wild animals are classified differently since the latter does not establish such strong coexistence bonds with humans.

Arluke et al.[11] created the sociozoologic scale, in which nonhuman animals are ranked based on their utilitarian purposes and, ultimately, their degree of submission to humans. According to the authors, our degree of consideration for other animals is a social construct based inherently on moral judgments: there would be "good" and “bad” animals. “Good animals” are those so domesticated and tame that they submit themselves to human desires. They are divided into two categories based on the supposed supremacy of our species over other life forms. The first category is that of “pets”, whose subordinate relationship to us is based on affection. The second category is called tools, consisting of both laboratory animals and industrially raised animals, mostly for food production. In this case, they are objectified beings, and their nature is reconstructed so that they are considered only as food or scientific data. “The place of good animals, whether human or nonhuman, is clear in the social order. They participate as 'decent citizens' of a sort by being trustworthy, predictable, and obedient in their given roles”[12].

On the other end, we have the “bad animals”. Basically, those that escape our control and do not conform to the human desire for absolute submission. They do not fit into the social roles that are considered "good" and are a challenge to our authority.

> Some animals, however, have a problem with their place in society. They may be freaks that confuse their place, vermin that stray from their place, or demons that reject their place. They are oddities that cause repulsion, unwelcome visitors that provoke fear, or dangerous attackers that rouse horror. In turn, society may ignore, marginalize, segregate, or destroy them.[13]

Costa[14] termed freaks as “weird” and defined them as animals whose social position is ambiguous. They live on the margins of society because they are not considered dangerous. Therefore, there is no urgency to destroy them. In this hierarchization of “bad animals”, vermin would be one step down as they are considered dirty and “[...] cross human boundaries threatening order and the environment”[15].

We also have species that not only provoke feelings of repulsion but are also vectors of disease. They are seen as threats to humans, and their killing is considered justifiable. At the lowest level would be the “demons”:

> Below vermin on the sociozoologic scale are the worst animals – commonly portrayed in popular culture as fiends, predators, or man-eaters – that contest the established social order itself. Vermin may refuse to stay in their lowly place, but demons mount a more serious and

[10] Edmund Leach, *Antropologia* (Ática, 1983).
[11] Arnold Arluke and others, *Regarding animals*. (Temple University Press, 2022) 223.
[12] Arnold Arluke and others, *Regarding animals*. (Temple University Press, 2022) 225.
[13] Arnold Arluke and others, *Regarding animals*. (Temple University Press, 2022) 229.
[14] Susana Costa, ‘*Letting people speak:* the importance of locals’ attitudes for effective conservation programmes’ (2016) 2 (2) *Journal of Primatology*.
<https://fatcat.wiki/release/kcil6b5usjcxlia5drbarznfv4> accessed on 20 November 2022.
[15] Ibid.

> "evil" challenge to the way things "ought to be" by trying to reverse the fundamental master-servant relationship present in the traditional phylogenetic order.[16]

Animals that are physically able to do this are placed in the demon category, such as the jaguar, the caiman, and the giant otter. However, as Costa[17] reminds us, although this scale is shared among most individuals of the same culture, it is flexible, and the same species can transition into different categories. A good example is the jaguar (*Panthera onca*), which is regarded negatively by farmers because it is considered a threat to the bovines, which they call "livestock"[18]. At the same time, they receive special consideration from tourists, who pay large sums to observe them in the wild[19]. For the latter, the jaguar's life is valuable and must be preserved, while for the farmers, their existence means harm and their proximity is undesirable.

In contemporary society, this mobility is driven strongly by the media, since, especially in urban areas, most of our coexistence with other animals still happens through what Thompson calls mediated worldliness: the way we interpret the world, especially what is beyond the reach of personal experience, is shaped by the mediation of symbolic forms.

> The spatial horizons of our understanding are greatly expanded since they do not have to be physically present at the places where the observed phenomena occur. The extent to which our understanding of the world has been shaped by media products today is so profound that when we travel the world to further places as visitors or tourists, our experience is often preceded by a set of images and expectations acquired through our prolonged exposure to media products[20].

This is also true for the kind of consideration given to nonhuman animals: the way they are represented in the media determines how they will be seen and treated by humans[21]. In this sphere, journalism contributes to promoting sorts of behavior towards nonhuman animals, which can be either positive or negative in terms of granting rights.

> Journalism acts beyond the production of news, of mass consumption of information. It is a vehicle for reinserting the audience into the social universe. We speak, then, of a sociocultural process of production, transmission, and absorption of the facts of everyday life, which act in

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[16] Arnold Arluke and others, *Regarding animals*. (Temple University Press, 2022) 233.
[17] (2016) costa susana.
[18] Felipe Sussekind, *O rastro da onça: as relações entre humanos e animais no Pantanal* (Letras, 2014) 54.
[19] Eveline Baptistella, *Animais não humanos e humanos no turismo do pantanal mato-grossense: da representação midiática ao encontro, 2020,* Doctoral dissertation (Doctorate in Contemporary Culture Studies), Contemporary Culture Studies Graduate Program, Universidade Federal de Mato Grosso.
[20] John B. Thompson, *A mídia e a modernidade: uma teoria social da mídia* (Vozes, 2011) 61
[21] Evelilne Baptistella, *A representação dos animais na imprensa: uma proposta de reflexão ética. Revista Comunicação, Cultura e Sociedade*, Tangará da Serra, v.8, n.8, p. 3 – 21, 018. Available at: <https://www.researchgate.net/publication/329629317_A_REPRESENTACAO_DOS_ANIMAIS_NA_IMPRENSA_UMA_PROPOSTA_DE_REFLEXAO_ETICA>.

the social construction of reality, as they become shared world experiences[22].

This imagination, also constructed by the information obtained through the media contributes to the mobility of nonhuman animals within the sociozoologic scale. Thus, they can be considered in different ways in different social groups, and their classification may fluctuate within the same population. For example, for a long time, giant otters were related to aggressiveness in the Brazilian media due to an episode in the Brasilia Zoo in 1977: a man was killed after jumping into the mustelid habitat to save a child and could not resist the injuries caused by the animals[23]. Nowadays, the species is benefiting from a positive representation, which highlights aspects of its social organization that are highly valued in contemporary Westernized societies, such as strong family ties[24]. Thus, we see that they have moved from the position of "demons" and are now represented as "good" animals.

Based on these reflections, we will analyze the representation of the nonhuman animals inhabiting the Brazilian Pantanal in the coverage of the fires that ravaged the biome between the months of May and October 2020. We investigated where the species were situated on the scale and what the journalistic narratives revealed about the social position occupied by these animals in the contemporary imagination. After all, how were they portrayed by the media, and how can this influence the consideration given to certain nonhuman animals?

3 Methodology and Theoretical Framework

Besides the sociozoological scale theory, this research is based on the theoretical framework and the interdisciplinary approach of Critical Animal Studies[25] or Human-Animal Studies[26], especially Critical Animal and Media Studies[27]. The critical approach

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[22] Luiz Gonzaga Motta and Others, '*Notícia e construção de sentidos: análise da narrativa jornalística'* (2004) *Revista Brasileira de Ciências da Comunicação* 27 (2) 33, <http://portcom.intercom.org.br/revistas/index.php/revistaintercom/article/view/1067> accessed on 24 January 2022.

[23] Luis Vidigal, *Morte de sargento que salvou menino no Zoo completa 40 anos* (Correio Brasiliense, 31 August 2017) <https://www.correiobraziliense.com.br/app/noticia/cidades/2017/08/31/interna_cidadesdf,622536/morte-de-sargento-que-salvou-menino-no-zoo-completa-40-anos.shtml> accessed on 05 May 2020.

[24] Eveline Baptistella, *Animais não humanos e humanos no turismo do pantanal mato-grossense: da representação midiática ao encontro, 2020,* Doctoral dissertation (Doctorate in Contemporary Culture Studies), Contemporary Culture Studies Graduate Program, Universidade Federal de Mato Grosso.

[25] Paul Waldau, *Animal studies*: *an introduction* (Oxford University Press, 2013).

[26] Margo DeMello, *Animals and Society*: *an introduction to human-animal studies* (Columbia University Press, 2021); Gary Francione and Anna Charlton, *Coma com consciência: uma análise sobre a moralidade do consumo de animais* (Exempla Press, 2015); Melanie Joy, *Porque amamos cachorros, comemos porcos e vestimos vacas: uma introdução ao carnismo: o sistema de crenças que nos faz comer alguns animais e outros não* (Cultrix, 2014).

[27] Nuria Almiron and Matthew Cole, '*The convergence of two critical approaches'* in Nuria Almiron, N, Matthew Cole and Carrie Freeman (eds), *Critical animal and media studies*: communication for nonhuman animal advocacy (Routledge 2016); Eveline Baptistella, '*A representação dos animais na imprensa: uma proposta de reflexão ética' (2018)* 8 (8) *Revista Comunicação, Cultura e Sociedade* <https://www.researchgate.net/publication/329629317_A_REPRESENTACAO_DOS_ANIMAIS_NA_IMPRENSA_UMA_PROPOSTA_DE_REFLEXAO_ETICA> accessed on 14 November 2022; Debra Merskin, *Seeing Species: Re-presentations of Animals in Media & Popular Culture* (Peter Lang Inc, 2018).

seeks to include the voices of human and nonhuman actors in the research and has a direct link with activism. It is a knowledge field where academic work has the premise to discuss and denounce animal suffering and maltreatment[28]. Various studies have identified the links between media depiction and violence toward other species, highlighting the importance of an ethical turn in this domain[29].

In this research, we adopted the content analysis methodology. This method was chosen because it consists of a model for selecting, systematizing, and treating data that allows us to reflect on cultural and social behaviors regarding animals at a given moment[30].

> Analysts take advantage of the processing of the messages they manipulate to *infer* (logically deduce) knowledge about the sender of the message or its medium, for example. Like a detective, the analyst works with *indexes* carefully highlighted by more or less complex procedures[31].

The sample was selected after a period of floating reading, seen as the first contact with the object of study[32]. We did that by reading the news about Pantanal on the leading Brazilian news websites between July and September 2020, collecting initial considerations about the theme. That allowed us to get to know the object to the point of being invaded by impressions and orientations[33], which helped the rise of hypotheses about the subject and build the research goals.

Then, using the rules of exhaustiveness, representativeness, homogeneity, and relevance[34], we chose the portals G1 and UOL for analysis. G1 is the news website of the most extensive media conglomerate in the country, the Globo Organization - which holds the most prominent Brazilian broadcast network, a radio network, a streaming service, a newspaper, several magazine titles, and a publishing house. The company tends to support neoliberal policies, but this did not happen with Jair Bolsonaro, president of Brazil from 2019 to 2022, an extreme right-wing politician. UOL is one of the most-read websites in the country and part of a conglomerate that has a newspaper, a streaming service, an online bank, and a postal service. It usually supports neoliberalism as well but has also taken a stand against Bolsonaro's term of office. Brazil's former president was openly contrary to the ecological agenda and a climate change denier. More than this, he was aggressive towards journalists and usually criticized the traditional media, supporting and spreading fake news, especially about COVID-19 and its vaccines. Both media conglomerates marked their position against these practices and beliefs. So, it was less likely that they would publish material with misinformation or that they had some hidden agenda to endorse government practices against the environment.

Moreover, we chose these two websites because they have ethical guidelines, and their reporters have at least an undergraduate degree. Likewise, both websites

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[28] Nuria Almiron, N, Matthew Cole and Carrie Freeman, *Critical animal and media studies*: communication for nonhuman animal advocacy (Routledge 2016).
[29] Eveline Baptistella, *A representação dos animais na imprensa: uma proposta de reflexão ética. Revista Comunicação, Cultura e Sociedade*, Tangará da Serra, v.8, n.8, p. 3 – 21, 2018. Available at: <https://www.researchgate.net/publication/329629317_A_REPRESENTACAO_DOS_ANIMAIS_NA_IMPRENSA_UMA_PROPOSTA_DE_REFLEXAO_ETICA>.
[30] Lawrence Bardin, *Análise de conteúdo* (70, 2015).
[31] Ibid 45.
[32] Ibid 45.
[33] Ibid.
[34] Ibid.

were easy to track down and had journalists working in the field, following what was happening in Pantanal. It is worth noticing that because many websites just copy the news from other vehicles.

Daily monitoring was performed from September 14 to October 14, 2020. Even though the fires began at least in June, it was our choice to cover the period above because it was when all of the national media started covering the situation in the wetland. The commotion started on Sunday, the 13th, when "Fantastico," a famous news show, broadcasted a report about the fires in Pantanal.

We had a total sample of 175 news reports analyzed. G1 had published 125 reports about it, while UOL was responsible for 50 news. After reading all the articles in full, we inserted the information obtained in a table[35] with six categories: portal, headline, section, date, most used terms, and link. We searched for news that mentions nonhuman animals in the context of the fires and the approach journalists used to represent nonhuman animals. The texts were categorized and classified according to the content released, mentioning nonhuman animals and if they were depicted as "good" or "bad", according to the sociozoologic scale. The criteria to be placed in the "good" category was to be depicted not only as a "pet" or a "tool", but also as somehow submissive or submitted to humans. The "bad" animal criteria followed the "vermin", "freak," and "demons" created by Arkule et al. (2022)[36], and we searched for depictions that somehow highlight the defiant behavior that is part of this concept.

4 Results/Analysis

In the media, nonhuman animals are no longer in the exclusive domain of the environment section and appear in topics ranging from health to celebrities[37]. So, in the present analysis, we tried to verify in which section the news pieces about nonhuman animals were placed. For example, were the nonhuman animals part of the news in the behavior or in the economics sections? We also wanted to check how they were depicted according to the sociozoological scale. By that, we can verify if nonhuman animals are regarded merely as commodities or depicted as people with rights and agency[38].

Among the 175 articles analyzed, 87 mentioned nonhuman animals, whereas 88 focused on the biome and its situation. In other words, the number of news reports addressing problems with nonhuman animals was almost the same as those addressing fires with subjects linked to different editorials, such as economics and politics. Most of the reports that addressed the situation of nonhuman animals orbited around the survival conditions of the species and were linked to ecological issues, such as extinction and loss of habitats. Nevertheless, a tiny part of the sample was in the ecological section. The most significant sample piece was published without editorial tags and connected with the daily news coverage.

Regarding the Pantanal animals, 54 articles used general terms such as "fauna", "other species", "small animals," and dead animal (Chart 1). Only a few species were treated individually and have received greater prominence. Even when there was a

[35] Table available at: <https://docs.google.com/spreadsheets/d/1RHPegbPCbZv9YJZc7on4j3BVGStO6v42TAjLfWfCna4/edit?usp=sharing>.

[36] Arnold Arluke and others, *Regarding animals.* (Temple University Press, 2022) 233.

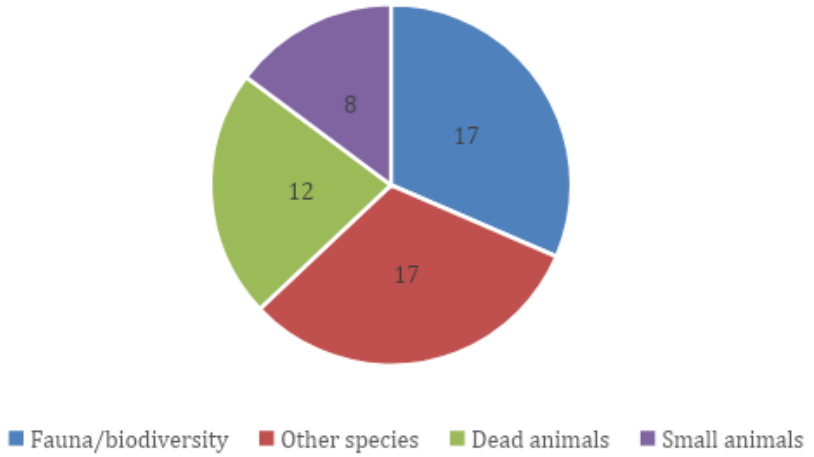
[37] Eveline Baptistella and Juliana Abonizio, '*A relação homem X animal na mídia: uma análise de editorias especializadas'* (2015), Encontro Nacional de Pesquisadores em Jornalismo Ambiental, 3.

[38] Bruno Latour, *Jamais formos modernos:* ensaio de antropologia simétrica (Editora 34, 2001).

general approach, reports mainly highlighted the suffering of nonhuman animals. Records of charred bodies or dead animals from smoke poisoning were widely explored. The use of images of the rescued animals, in which most had burns or severe injuries, was another highlight of the news. The reports emphasized the pain, hunger, and thirst of nonhuman animals. Human sources were interviewed to speak about the animals' suffering. For example, Cristina Gianni, founder of the NEX Institute, stated to G1: “The burns on their paws, it is easy for us to put ourselves in their place and imagine the pain of stepping on hot coals.”

Chart 1

Most commonly used general terms in reference to nonhuman animals.

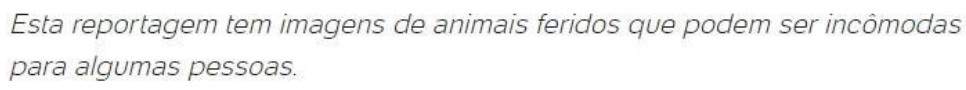


Source: Elaborated by the authors.

In the field, veterinarians, firefighters, and volunteers gave names to some rescued nonhuman animals. The press quickly focused on these animals, and the reports highlighted their personality traits, expressing the individuality of each one. At UOL, images of nonhuman animal suffering had a “trigger warning” (Figure 1), alerting the reader at the beginning of each report of possible discomfort caused by seeing the images of injured animals. A resource often used in articles that deal with violence against humans. In contrast, at G1, this alert was not displayed (Figure 2).

Figure 1

Alert used by UOL to prepare the reader for the images of injured or dead animals throughout the text.



Source: UOL Notícias.

Figure 2

Image of a jaguar with severe burns on its paws, released by G1, without a warning to the reader.

Cuidador mostra queimaduras nas patas de uma onça-pintada adulta chamada Amanaci sofrida após um incêndio no Pantanal, enquanto o animal passava por tratamento com células-tronco, na ONG Instituto Nex, em Corumbá de Goiás — Foto: Ueslei Marcelino/Reuters

Source: G1 — Portal de Notícias.

Wild animals were depicted as victims not only because of the fires but also because of human actions. On the other hand, several pieces featured the relationship between human volunteers and nonhuman animals, pointing to an emotional bond between the victims and the humans who decided to help them.

The sample had 15 species mentioned (Table 1), particularly emphasizing the jaguar. The giant feline was a highlight in 25 News reports. Among wild animals, anteaters also stood out and ranked third in the number of times mentioned in the media. Due to their ability to generate significant public interest, these species received increased coverage. Both species are in the list of Pantanal flagship species[39].

In some articles, the condition of tourist attraction was outlined, and the two species were named the "postcards of the Pantanal" — some reports even stated that these animals were the most "coveted" by the tourists that frequented the region. The extinction risk was another criterion highly quoted: species considered endangered or vulnerable were more valued in the narratives.

Throughout the reports analyzed, when the subject extended to other species than the jaguar and the anteaters, we observed the use of vague terms such as "fauna," "other animals," "small animals," and "other species." This use of words demonstrated the attribution of certain inferiority to the unnamed animals if compared to the "postcards of the Pantanal" - as if humans' predilection for certain species made others invisible.

Still, all the wild species affected by the fires in the Brazilian Pantanal were portrayed as victims, animals that deserved not only sympathy but also demanded human protection.

[39] Eveline Baptistella, *Animais não humanos e humanos no turismo do pantanal mato-grossense: da representação midiática ao encontro, 2020,* Doctoral dissertation (Doctorate in Contemporary Culture Studies), Contemporary Culture Studies Graduate Program, Universidade Federal de Mato Grosso.

Table 1

Nonhuman animals mentioned throughout the articles.

Nonhuman animals	Number of mentions
"Jaguar"	25
Bovines ("Livestock"; "Cattle"; "Production animals"; "Targeted cattle grazing")	10
"Anteater"	9
"Alligator" ("Dead alligator"; "Charred alligator")	8
"Fish"; ("Tuvira"; "Fish mass mortality"; "Tilapia skin")	7
"Deer"	6
"Blue Macaw"	5
"Snakes"	5
"Tapirs"	4
"Tortoises"	4
"Monkeys" ("Spider monkey"; "Capuchin monkeys")	4
"Frogs"	3
"Toucans"	2
"Tuiuiú"	2
"Otters" ("Little otters")	1

Source: Elaborated by the authors.

Bovines — regarded as “good animals” for being confined to the imposed role of a food product — failed to prove worthy of the same commotion, and the images of the charred bovines were not given the same prominence or similar consideration in the journalistic discourse. Despite being the animal with the second highest number of mentions, their suffering was hardly mentioned in the news and little discussed.

Bovines have mainly emerged as a target of controversy due to the position of federal authorities advocating what has become known as the “firefighting cattle” theory (Table 2). Some reports highlighted the speech of the Minister of Agriculture, Tereza Cristina, in a Public Hearing in the Senate, that a wider presence of cows in the biome would reduce fires because the animals would have the role of reducing biomass. Arnildo Pott, currently a researcher at the Brazilian Agricultural Research Corporation (Embrapa) and creator of the term “firefighting cattle” – a type of targeted cattle grazing – in the 1980s, says that his research was based on small properties in the Pantanal, with low-scale livestock production and low productivity. It is the opposite of what currently happens in the Brazilian agribusiness since bovine breeding

has increased significantly in recent years in the Pantanal[40]. According to the National Center for Monitoring and Early Warning of Natural Disasters (Cemaden)[41], the Pantanal has been facing the worst drought in the last 60 years. The dry climate and the arson fires are the main reasons for the disaster in the biome.

Table 2

Terms used to refer to bovines.

Terms in the news reports
- "Firefighting cattle" - "Fire reducing cattle" - "Cattle that prevents fire spreading" - "Combat cattle" - "Production animal" - "Fire victim (semi-pulled horn)" - "Dead cattle"

Source: Elaborated by the author.

Another species received a utilitarian treatment in the news: the fish (Table 3). Most articles mentioned fish as food for other animals. Only two species were named in the seven news reports where fish were in the spotlight: tuvira and tilapia. The latter is not a local species, but its medicinal purpose was featured since its skin was used to treat burns on animals such as the jaguar and the giant anteater. Tuvira appears as food offered by volunteers to mitigate the hunger of nonhuman animals. In this case, mentions of fish mass mortality only highlighted that such a fact compromises the survival of various species that feed on these animals.

[40] Cleyton Vilarino, *Conceito do 'boi bombeiro' está sendo distorcido, diz pesquisador que criou o termo* (Revista Globo Rural, 16 October 2020) <https://revistagloborural.globo.com/Noticias/Sustentabilidade/noticia/2020/10/conceito-do-boi-bombeiro-esta-sendo-distorcido-diz-pesquisador-que-criou-o-termo.html> accessed on 27 November 2020.

[41] Cemaden, *Seca do Pantanal é a mais intensa dos últimos 60 anos, estimam pesquisadores do Cemaden (Cemaden,* 18 August 2020) <http://www2.cemaden.gov.br/seca-do-pantanal-e-a-mais-intensa-dos-ultimos-60-anos-estimam-pesquisadores-do-cemaden/> accessed on 9 September 2020.

Table 3

Terms used to refer to fish.

Terms in the news reports
- "Dead fish" - "Tuvira as food for otters" - "Fish carcass" - "Food for tuiuiús" - "Seed-dispersing fish" - "Fish mass mortality" - "Piracema" - "Tilapia Skin" - "Burn Treatment" - "Skin discarded by fish farming"

Source: Elaborated by the author.

Despite Pantanal's having human communities, there was no mention of pets. In the reports analyzed, we see that the characterization of human animals and their relations with other species is set in a duality. On the one hand, the news positively characterized humans mobilized to relieve, rescue, and treat nonhuman animals. On the other hand, we see the human being as the tormentor, responsible for the fires, or negligent about the protection that the biome demands. In this case, the negative representation fell on the large landowners, pointed out as the main suspects of the fires in several reports, and on the government leaders, who would be failing to fulfill their role in terms of environmental preservation.

5 Final Remarks

Arluke and others[42] point out that the meanings attributed to nonhuman animals vary in our society because they are social constructions. The media is part of this process because "(...) as a social institution whose influence is barely rivaled by family, religion, or education, the mass media provide a curriculum, a way of learning about ourselves and the world"[43]. Most of us will never have the chance to meet a jaguar, so we tend to form our opinion about them based on the information the media provides. Thompson[44] calls this process mediated worldliness, meaning that part of our life experience is built through media products, such as movies, documentaries, and news reports. So, the nonhuman animal depiction largely influences how humans behave towards other animals[45]. For example, Brazil had an outbreak of yellow fever in 2016. As the press failed to explain the monkeys' role in the disease cycle, many simians were violently killed all over the country because humans were afraid of them[46]. Especially to nonhuman animals, being depicted as "good" or "bad" is a matter of life or death.

[42] Arnold Arluke and others, *Regarding animals.* (Temple University Press, 2022) 7.
[43] Freeman and Merskin, 2017, p. 208).
[44] John B. Thompson, *A mídia e a modernidade: uma teoria social da mídia* (Vozes, 2011) 61.
[45] Eveline Baptistella, *A representação dos animais na imprensa: uma proposta de reflexão ética*. *Revista Comunicação, Cultura e Sociedade*, Tangará da Serra, v.8, n.8, p. 3 – 21, 018. Available in: <https://www.researchgate.net/publication/329629317_A_REPRESENTACAO_DOS_ANIMAIS_NA_IMPRENSA_UMA_PROPOSTA_DE_REFLEXAO_ETICA>.
[46] Ibid.

In the present work, we verified that wild animals were mainly portrayed as "good animals." In the context of the sociozoologic scale, the jaguar, traditionally classified as a "demon" for being an animal that does not submit to human control, appears in a new light, portrayed as a victim. Ocelots, caimans, and other species that would be in this sphere are represented in the same situation. Despite being neither domesticated nor exploited for human purposes, these animals still appear as the target of our dominance. A control against which they cannot rebel since the anthropic action unequivocally affects their survival conditions.

If there are conflicts between human and nonhuman animals in the region — primarily arising from the predation of farmed animals — there is no mention of such species in the sphere of "bad animals" in the reports. In addition, being positioned as a charismatic species in tourism reinforces the idea that such individuals do not pose a risk and coexist peacefully with humans. A process called "petification" of wild species, which are now represented as close to domesticated animals[47]. For example, otters were called "little otters" in a specific news report. We can also mention the practice of naming injured animals, which resembles how humans treat their pets. One specific Jaguar was named "Ousado" (bold in English) and became so famous that he was the subject of various reports even one year and a half after the fire. Other rescued jaguars did not have the same media attention.

They are "good" because they are victims of our actions and have become so vulnerable that they depend on our help to survive the consequences of the fires. However, we still have clear hierarchies within that spectrum. Flagship species are the most explored in the reports not only because of their privileged status in the social imagination but also because they are considered endangered, which increases their value. The media also displayed these animals as beings with personality and consciousness, struggling for their lives. Even their suffering was considered a sensitive matter for UOL and tagged with a trigger warning.

Thus, broader ecological issues found resonance in these reports, but we also observed a view of nonhuman animals as individuals outside of a utilitarian representation. That is, as beings whose existence has an intrinsic value, a term proposed by Godfrey-Smith[48]. On the other hand, bovines and fish, as animals exploited/used for food production, have their suffering almost completely ignored and have their lives treated from a utilitarian viewpoint. These two species were positioned as "tools" in the domain of the "good animals." The sample revealed fish regarded as food or medicine. Some may say that their suffering may be hard to depict because they live underwater, but by that moment, there was not only the fire but also a severe drought that highly impacted their habitats.

Although cows are more visible, the press still fails to recognize their individuality and right to a dignified life. The bovines were commodified and mentioned chiefly in the economics section, often treated as "economic losses." Their suffering was little discussed, and even the federal government quoted distorted theories (the firefighting cattle) that placed cows as mere tools. Despite the reservations about this theory in the reports, such discourse highlighted the asymmetry in the social position of nonhuman animals. Going through the same problems derived from fires wild species faced, farmed animals did not have their

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[47] Eveline Baptistella, *Animais não humanos e humanos no turismo do pantanal mato-grossense: da representação midiática ao encontro, 2020,* Doctoral dissertation (Doctorate in Contemporary Culture Studies), Contemporary Culture Studies Graduate Program, Universidade Federal de Mato Grosso.

[48] William Godfrey-Smith, *The value of wilderness (1979), Environmental Ethics* 309.

suffering considered in the same way, and only a utilitarian point of view prevailed about them.

Then, we see a scenario in which there are advances in representing wild animals, especially because their right to live and have a good life was highlighted. However, asymmetries and hierarchies remain, as seen in the treatment given to fish and bovines. These animals still lack a media representation that positions them outside the spectrum of tools, food, or other products.

Francione and Charlton[49] state that our society suffers from moral schizophrenia. According to them, despite recognizing that it is wrong to impose suffering on nonhuman animals, people still maintain practices that harm other species. In contrast, Joy[50] uses the term psychic numbing for the mechanism that leads people to like animals and eat meat. Our sample reflects these moral contradictions, as some animals are better regarded than others. It is also a reminder of how economic issues tend to mingle in the news discourse[51]. Charismatic species such as jaguars are now in the "good animals" sphere also because they are "workers" cooperating with tourism activities[52]. In turn, the bovines are mammals, just like the jaguars. However, as they live and die only to be exploited by humans, news that features their feelings would raise discomfort and might even promote aggressive responses from society. More than this, we cannot forget that reporters are also part of a carnist culture and, probably, most of them see cows only as products and jaguars as magnificent animals that will perish due to our irresponsible behavior towards other forms of life.

Nevertheless, our analysis showed that some important topics to the animal rights movement were addressed, as wild animals were depicted as persons with the right and the will to live. As an ironic note, the humans were the ones placed in the "bad animals" field. Given that, it is urgent to acknowledge that the press influences our cultural patterns and enhances works to promote ethical guidelines in the media representation of other animals. That is a call and mission not only for Critical Animal and Media Studies researchers but to all advocates of the animal rights plea.

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[49] Gary Francione and Anna Charlton, *Coma com consciência: uma análise sobre a moralidade do consumo de animais* (Exempla Press, 2015) 37.

[50] Melanie Joy, *Porque amamos cachorros, comemos porcos e vestimos vacas: uma introdução ao carnismo: o sistema de crenças que nos faz comer alguns animais e outros não* (Cultrix, 2014) 41.

[51] Nuria Almiron and Matthew Cole, '*The convergence of two critical approaches'* in Nuria Almiron, N, Matthew Cole and Carrie Freeman (eds), *Critical animal and media studies*: communication for nonhuman animal advocacy (Routledge, 2016).

[52] Eveline Baptistella, *Animais não humanos e humanos no turismo do pantanal mato-grossense: da representação midiática ao encontro, 2020,* Doctoral dissertation (Doctorate in Contemporary Culture Studies), Contemporary Culture Studies Graduate Program, Universidade Federal de Mato Grosso.

Speciesism in Climate Change-Related Disasters: Billions of Animals are Excluded from the Continuum of Disaster Management

Catherine Besch

Abstract: The warming climate and increasing rate and strength of disasters resulting from shifting weather patterns affect both humans and animals. As disaster management agencies globally are forced to become more effective at preparing and responding to climate-related disasters, the most populous farmed species are being left out of these plans. As the number of animals at risk of disaster events increases, it is mostly companion animal species that have been given more consideration for evacuation and sheltering. Species such as chickens, the most populous avian species on the planet, along with the rest of the eighty billion other farmed land animals that are killed every year for human consumption, have little to no protection in both intensive and extensive farming systems, whether in high or low-income countries. The speciesism prevalent in society is mirrored in disaster management to the detriment of public health, the environment, and animal rights.

Keywords: speciesism; disaster response; climate change; pastoralism; factory farming.

1 Introduction: Farmed Land Animals Face Increasing Threats from Climate Change-Related Disasters (CCRDs)

Within the current framework for international disaster management guidelines from government and nongovernmental agencies at the international and down to the community level (examples include the Sendai Framework[1] and LEGS[2]) the welfare and rights of farmed animal species used for human consumption such as cows, pigs, chickens, goats, ducks, sheep, and camelids are disregarded as sentient individuals. Their value in these frameworks is stated only instrumentally as economic tools and their status is relegated to just property.[3] Species are divided into either those that are units of production or those to which humans have an emotional attachment. They are classified on a sociozoological scale that defines farmed animals as tools and in order to do so, deanthropomorphized.[4] Farmed animals are seen as beings below humans,

[1] UNDDR, "Sendai Framework for Disaster Risk Reduction 2015-2030", United Nations Office of Disaster Risk Reduction (2015) <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030> accessed 20 February, 2023.
[2] LEGS (2014). Livestock Emergency Guidelines and Standards, Second edition. Rugby, UK. Practical Action Publishing. <https://www.livestock-emergency.net/wp-content/uploads/2021/09/LEGS-Handbook-2nd-edition-web-version-1.pdf>.
[3] Best, A. (2021). The legal status of animals: a source of their disaster vulnerability. *Australian Journal of Emergency Management*, 36(3), 63–68. https://doi.org/10.47389/36.3.63
[4] Arluke, A., Sanders, C. R., & Irvine, L. (2022). The Sociozoologic Scale. In Regarding Animals (2nd ed., pp. 167–186). Retrieved from <https://tupress.temple.edu/book/20000000010456>.

below companion animals, below those species who fulfill the purpose of being near family status or, at the very least, entertaining such as captive wild animals in zoos and circuses. They are expected to have little understanding of the world, including the experience of pain.[5] An animal species with the "companion" classification means they possess intrinsic value necessitating protection from natural and man-made hazards, something many countries are now developing better logistics, infrastructure, and regulations for. While companion animal species have in recent decades been added to disaster plans and now have national-level relief funds and logistical support in countries such as the US, the vast majority of domesticated animals killed during disasters have no similar protection while they are recognized as merely economic units with the sentience and rights equivalent to a piece of machinery in a factory. According to feminist and animal rights writer Carol Adams, farmed animals are story-less, "absent referents", and are "'meat' when alive and 'units' when they die in any way other than the slaughterhouses".[6]

The public health and environmental consequences of leaving farmed species to die in confinement are costs that go beyond individual animal suffering and affect the communities and ecosystems surrounding livestock-rearing facilities. The increasing number of intensified agricultural systems such as Concentrated Animal Feeding Operations (CAFOs)[7] makes the logistics of evacuation and sheltering virtually impossible in most countries due to the high number of animals to transport and house safely.[8] The individuals raised in small farms and pastoralist systems fare no better as property and profit, a status which ensures that owners have no legal obligation to provide for their care beyond what government or private insurance policy requires.[9]

Despite the inextricable link between public health, the environment, and animal welfare, the preservation of human life supersedes all other affected parties in disaster management often to the detriment of all non-human victims. The increased frequency of Climate Change Related Disasters (CCRDs) necessitates investigating how to more equally mitigate disasters for companion animals, wildlife, and farmed animals. During both slow and rapid onset CCRDs, animals exploited for human consumption, clothing, research, and entertainment are left behind in disaster planning and response and more government and private sector investment to move away from these systems would counteract that. While the elimination altogether of these systems of exploitation for human profit remains far off, acknowledging and acting on the inherent risk to farmed animals is necessary, as will be seen in the following examples.

Speciesism, defined here as prejudice or discrimination based on species, is deeply embedded in the field of disaster management. This discussion that follows will provide examples of several increasingly common CCRDs around the world. These examples will cover animals that are exploited for their meat, milk, coats, skins, and blood in both intensive and extensive farming and in sedentary as well as pastoralist systems among a variety of geographical, political, and economic situations.

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[5] Ibid (no. 3).
[6] Carol Adams quoted in Irvine, L. (2021). Filling the Ark: Animal Welfare in Disasters. Temple University Press.
[7] Doug Gurian-Sherman, "Production Costs of CAFOs and Alternative Systems", *CAFOs Uncovered: The Untold Costs of Confined Animal Feeding Operations*, Union of Concerned Scientists (2008) pp. 13–28. *JSTOR*, <http://www.jstor.org/stable/resrep00054.7> accessed 11 Mar. 2023.
[8] James Sawyer, and Gerardo Huertas. G. (2018). *Animal Management and Welfare in Natural Disasters* (1st ed). New York, N.Y.: Routledge.
[9] Ibid.

Throughout the discussion that follows, the vein of speciesism inherent in cultures around the world as well as in prominent animal advocacy groups is shown to also be prevalent in disaster management. While the dominant rhetoric in the field of disaster management parrots the mantra that the only value in protecting farmed animals is in protecting community economic resilience, the lives of billions of sentient beings are not protected from suffering and death. Disaster management actors in the past decade have seen benefits to early intervention for animals in the wake of CCRDs, but have yet to seek to eliminate the systems that put these commodified animals in harm's way in the first place and realistically will not any time soon.[10]

As CCRDs have increased in strength and frequency in the past several decades, the most common are hydrometeorological (floods and storms) and climatological (droughts and heat waves).[11] From 1970-2019, the frequency of these events has increased by a factor of five globally with droughts causing the most human deaths followed by storms, floods, and extreme temperatures.[12] These disasters take significant public and private resources to respond to and countries with the least financial and logistical support, particularly in the Global South, are those for whom the effects can be catastrophic. Property loss in addition to the loss of life can take years of intense, expensive, multilateral relief to recover from.

Twenty-five percent of the world's population live in flood-prone regions, 4 out of 10 of them living in poverty, thus the impact of flood mitigation cannot be understated for both humans and non-human animals. Since nearly eighty billion land animals are killed for human consumption every year,[13] many of whom are owned by the world's poorest populations in the most disaster-prone regions in South and East Asia, the risk for farmed animal species mortality is highest in these flood-prone regions.[14] What is easy to forget, however, is that it is not the poorest countries in which the largest numbers of farmed animal species are confined and where the most significant policy shifts away from speciesism in disaster management need to take place to reduce morbidity and mortality. The first examples outlined below in British Columbia, Canada, and across Eastern North Carolina in the US show that it is the intensification of animal agriculture that proves the deadliest in wealthier countries which have the highest rates of animal product production and consumption. Regardless of location, type of disaster, or species affected, the following discussion will show that there is much work to be done on eliminating speciesist language and policy from the future of disaster management. The animals born into the food system fare the poorest as a result of speciesism and the livelihoods and economies that revolve around these farmed animals are at stake as well. As shown in the following

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[10] Ibid (no. 6).

[11] Vinod Thomas, Jose Albert, and Rosa Perez, "Climate-Related Disasters in Asia and the Pacific" (2013) ADB Economics Working Paper Series No. 358, Manila: Asian Development Bank. <https://www.adb.org/sites/default/files/publication/30323/ewp-358.pdf> accessed 3 March, 2023.

[12] World Meteorological Organization, "Weather-related disaster increase over past 50 years, causing more damage but fewer deaths" (31 August, 2021) <https://public.wmo.int/en/media/press-release/weather-related-disasters-increase-over-past-50-years-causing-more-damage-fewer#:~:text=The%20number%20of%20disasters%20has,deaths%20decreased%20almost%20three%2Dfold> accessed 20 February 2023.

[13] "Number of Animals Killed", Viva! UK (2022) <https://viva.org.uk/animals/number-animals-killed/>.

[14] Jun Rentachler, Melda Salhab, and Bramka Jafino "Flood risk already affects 1.8 billion people: Climate change and unplanned urbanization could worsen exposure" (28 June, 2022) World Bank Blogs <https://blogs.worldbank.org/climatechange/flood-risk-already-affects-181-billion-people-climate-change-and-unplanned> accessed 28 February 2023.

examples, excluding farmed animals from disaster plans has far-reaching consequences.

2 Examples of Speciesism in Recent Global Disasters

2.1 The Triple Threat: Heat Dome, Wildfires, and Flooding in British Columbia, Canada

The summer of 2021 in British Columbia (BC) was the setting for a sequence of CCRDs that affected much of Western Canada and the Pacific Northwest of the US. It began with the summer heat dome at the end of June 2021 which was responsible for a 440% increase in excess mortality in BC as record temperatures reached a high of 49.6˚C.[15] Subsequently, over 100 wildfires broke out in the region and the town of Lytton, where the record-setting temperature was recorded, was almost entirely incinerated.[16] Due to the lack of rain coupled with the extreme heat and additional lightning storms, 1610 wildfires over the summer of 2021 burned 868,000 hectares.[17] The drought resulting from the heat dome that contributed to the rise in wildfire incidents was then responsible for the devastating effects of the floods that followed.[18]

During the heat dome alone, an estimated 400,000 chickens died. During that one summer alone, 1.3 million farmed animals were killed in these successive CCRDs. In November of 2021, after the land had been ravaged by drought and wildfires during the summer, an atmospheric river inundated the land and created the costliest disaster in the history of British Columbia.[19] During these floods and landslides, most of the animal deaths occurred from drowning and/or hypothermia in their facilities housing hundreds of cows or thousands of pigs, and up to hundreds of thousands of poultry.[20] These staggering numbers of animals cannot be evacuated without having mass transport and sheltering available at a moment's notice for rapid-onset flash floods. Having species-appropriate shelters at the ready that are capable of taking in these high numbers of terrified animals is often just not possible without significant planning and the will to protect them. When factoring in infectious disease management, veterinary care, feed supplies, and having trained and experienced handlers available for such operations to limit animal injury and death, the logistics of evacuation and sheltering is an overwhelming, resource-intense challenge that many farmers either cannot or will not partake in.[21]

Due to the location of most of the farmed animal deaths in an area that was once a lake before being drained to create farmland, insurance companies and government officials were concerned about the rebuilding of farms in this flood-prone region in a

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[15] Sarah Henderson, Kathleen McLean, Michael Lee, and Tom Kosatsky "Analysis of community deaths during the catastrophic 2021 heat dome: Early evidence to inform the public health response during subsequent events in greater Vancouver, Canada" *Environ Epidemiol*. (19 Jan 2022) ;6(1):e189
[16] Vjosa Isai, "Heat wave spread fire that erased Canadian town" *New York Times* (21 July, 2021). <https://www.nytimes.com/2021/07/10/world/canada/canadian-wildfire-british-columbia.html> accessed 7 March 2023.
[17] Official website of the Government of British Columbia, BC Wildlife Service, Wildfire Season Summary (2021). <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary> Accessed 7 March 2023.
[18] Ibid.
[19] Brian Hill, "1.3 million farm animals dead due to climate change: What can BC do to stop the next catastrophe? *Global News* (7 December, 2021) <https://globalnews.ca/news/8427762/b-c-flooding-kills-650000-farm-animals> accessed 4 March, 2023.
[20] Ibid.
[21] Ibid (no 8).

province in which seasonal CCRDs are becoming the norm. Animal welfare laws in BC in a country generally acclaimed for welfare standards did nothing to prevent these deaths because recommendations for farmers to include evacuation plans or contingency plans for power outages on CAFOs are merely suggested, not legally mandated.[22] To require these farmers -a population working in a sector with already low-profit margins and high expenditures and loans- to have mandatory evacuation plans for 50,000-100,000 birds, hundreds of cows, or thousands of sheep or pigs (the evacuation of which would be required to be self-financed) would price most producers entirely out of the market. The director of the Canadian Coalition of Farm Animals in Hill's article[23] explains that governments are reluctant to make emergency evacuation plans mandatory due to the extra burden on farmers even though this greatly reduces protections for the individual animals in their care.

Mandatory evacuation and shelter plans for farmers is a potential disaster mitigation strategy, one not different from those that disaster managers recommend for places such as correctional facilities, hospitals, and care facilities in which living beings are confined, usually not mobile on their own, and under the constant watch of caretakers. This requirement, when coupled with zoning regulations limiting the density of animals per acre of land, would also effectively eliminate the economies of scale that make intensive animal agriculture a viable business model.[24] Ultimately, if the goal is to reduce animal mortality, or even to just protect livelihoods and local economies, the long-term mitigation strategy should include reducing the number of animals born into intensive animal agriculture and exposed to CCRDs with no chance of survival. To protect the artificially low prices of animal products by protecting CAFO farmers' bottom line with taxpayer-funded farm subsidies[25] is at the expense of the rights of billions of individual lives born into the food system. While the agricultural economy of BC was hit hard by this disaster and farmers were left with little more than fields of corpses, none fared worse than the animals themselves who were unable to escape their fate in this triple disaster.

Legally, the farmers in BC were not liable for the death of the animals in their care who died in the floods from drowning or hypothermia, and they faced no penalties due to the absence of mandatory evacuation for their herds or flocks. In addition to this lack of liability for their animals' deaths, the BC Prevention of Cruelty to Animals Act states that "farmers 'must not be found guilty of an offense if their actions are carried out 'in accordance with the prescribed standards of care' for the kind of farming they engage in".[26] The standards of care for animal agriculture globally, regardless of animal welfare laws in place, is that animals are property first and foremost, and as property and profit, their individual lives matter less than their economic value.[27]

From this example in Canada, it is important to note that the primary focus of disaster management is not solely human protection. Protecting property and infrastructure, preventing environmental damage, safeguarding public health and safety, and ensuring business continuity are also among the goals of effective disaster

[22] Ibid.
[23] Ibid.
[24] Gurian-Sherman (no 1).
[25] Christina Sewell, "Removing the Meat Subsidies: Our cognitive dissonance around animal agriculture" (11 February, 2020) <https://jia.sipa.columbia.edu/removing-meat-subsidy-our-cognitive-dissonance-around-animal-agriculture#17> accessed 3 March, 2023.
[26] Hill (no 8).
[27] Francione, Gary L. "Reflections on 'Animals, Property, and the Law' and 'Rain without Thunder.'" *Law and Contemporary Problems*, vol. 70, no. 1, 2007, pp. 9–57. *JSTOR*, <http://www.jstor.org/stable/27592164> accessed 9 March, 2023.

management in each phase: mitigation, preparedness, response, and recovery. However, within the existing system of animal welfare laws and guidelines regarding animals in disaster, the lack of protection for farmed animals only falls under business continuity and protecting property and that falls secondary to the protection of human victims. Farmed animals in BC were a side note even as protection for companion animal species increases globally. The words of the Abbotsford, BC mayor during the floods of November 2021 sum this up well: "I know it's hard for farmers to leave their livestock, but people's lives are more important to me right now than livestock or chickens.".[28] When given the opportunity to save a human or a chicken, most people would certainly help the human, but it is important that disaster plans get closer to eliminating people from having to make this choice at all by including farmed animals in preparedness or by preventing CAFOs being built in the first place.

Disaster mitigation in the Fraser Valley where the worst of the flooding and animal deaths took place would involve a shift in agriculture production entirely. If the suffering and deaths of the millions of animals that perished unnecessarily during the heat dome, wildfires, and floods of 2021 in BC were a consideration of the provincial government and disaster management agencies, subsidizing and committing to a transition to plant-based agriculture for the region would be the best chance for successful mitigation.[29] Given that climate change in BC has increased the probability of the atmospheric river event causing flooding by roughly 60%, and animal agriculture is the second highest source of anthropogenic greenhouse gases,[30] it is counterproductive to try to solve the problem of increased risk of flood disasters in Fraser Valley by continuing to support this main driver (and the largest number of victims) of climate change.

2.2 Stronger Storms: Hurricane Florence, North Carolina

The effects of Hurricane Florence of 2018 were felt most intensely in the hog and poultry-producing state of North Carolina. During Florence's history through the Atlantic storm season, it was briefly a Category 4 hurricane offshore, but it made landfall in North Carolina on 14 September 2018 as a Category 1 hurricane with sustained winds of 150kmph.[31] Despite the lower wind speed, the slow-moving storm dropped days of heavy rain in the floodplains of the state where the vast majority of CAFOs operate. With over 6500 CAFOs in NC, this flat Eastern side of the state contains the majority of factory farms.

Ten billion gallons of wet animal manure is generated in the state every single year from these farms along with 2 million tons of dry animal waste from chickens.[32]

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[28] Jordan Reichert, "BC flooding exposes the ongoing disposability of animals in agriculture", Animal Protection Party of Canada (29 November, 2021) <https://www.animalprotectionparty.ca/b-c-flooding-exposes-the-ongoing-disposability-of-animals-in-agriculture> accessed 9 March, 2023.
[29] Ibid.
[30] Nathan P. Gillett, Alex J. Cannon, Elizaveta Malinina, Markus Schnorbus, Faron Anslow, Qiaohong Sun, Megan Kirchmeier-Young, Francis Zwiers, Christian Seiler, Xuebin Zhang, Greg Flato, Hui Wan, Guilong Li, Armel Castellan, "Human influence on the 2021 British Columbia floods", *Weather and Climate Extremes*, vol. 36 (2022).
<https://www.sciencedirect.com/science/article/pii/S2212094722000287> accessed 2 March, 2023.
[31] "Hurricane Florence: 14 September, 2018", National Weather Service, National Oceanic and Atmospheric Administration (2022) <https://www.weather.gov/ilm/HurricaneFlorence>.
[32] Christina Cooke, "North Carolina's Factory Farms Produce 15,000 Olympic Pools Worth of Waste Each Year", Civil Eats (28 June, 2016) < https://civileats.com/2016/06/28/north-carolinas-cafos-produce-15000-olympic-size-pools-worth-of-waste/> accessed 20 February, 2023.

One hundred and seventy of these waste lagoons are on 100-year flood plains[33] and during Hurricane Florence's torrential downpours lasting days, the flooding that followed caused multiple threats to public health and the surrounding land and waterways as a result of overflow from CAFO waste lagoons.

Public health concerns just from waste lagoons include the contamination of surface and groundwater and unmonitored and tested private wells with antibiotics; bacteria such as E. coli, salmonella, giardia, leptospirosis, brucella, and anthrax; viruses such as enteroviruses, caliciviruses, adenoviruses, coronaviruses, and rotaviruses to name just a few zoonotic pathogens.[34] While parasites, pharmaceutical metabolites, viruses, and bacteria are the greatest threat to humans and other animals in contact with the water, the heavy metals in animal feed as well as the nutrient load in the waste lagoon runoff have serious implications for aquatic ecosystems that this leakage ends up mixing with. Ammonia, nitrates, and phosphorus can cause eutrophication, or excessive algae growth, which then reduces the amount of oxygen in the water to the point that aquatic species can no longer live there and lakes, ponds, rivers, and even ocean dead zones occur.[35] Monitoring of the estuaries of the Albemarle-Pamlico Sound on the coast of North Carolina showed significant algae blooms and "unprecedented nutrient- and organic matter-laden freshwater discharges to nutrient-sensitive receiving coastal waters".[36]

The waste lagoon runoff in North Carolina contained all these pathogens, heavy metals, and nutrients plus solid waste. In addition, carcass removal became necessary as the flood carried away the bodies of millions of deceased animals and added to their ranks the thousands of dead fish who floated on the top of flood waters infested with lagoon slurry. Very few of the farmed animal survivors were able to make it to sanctuaries to escape their fate of returning to the food system.[37]

Even with plenty of warning that the hurricane was on its way, the potential to evacuate these millions of farmed animals and protect full waste lagoons from leakage was limited. While cat and dog shelters were evacuated and horse farms had plenty of places to move West out of the storm's path, pig and poultry farms simply cannot evacuate animals who have never even seen the light of day and are housed together by the thousands. There was also no incentive for farmers to do so while they were merely insured property like tractors or buildings.

The US Department of Agriculture (USDA) runs a livestock indemnity program to reimburse farmers for losses of livestock and crops due to a disaster. This reimbursement rate is 75% of the animal's market value on the day before they died from the disaster event.[38] The complaint from smaller farms is that this

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[33] "Exposing Fields of Filth in North Carolina: landmark report maps feces-laden hog and chicken operations in North Carolina", Environmental Working Group, Washington, DC (21 June, 2016) <https://www.ewg.org/research/exposing-fields-filth-north-carolina> Accessed 2 March, 2023.

[34] M. D. Sobsey, L. A. Khatib, V. R. Hill, E. Alocilja, S. Pillai, Pp. 609-666 in Animal Agriculture and the Environment: National Center for Manure and Animal Waste Management White Papers (2006), J. M. Rice, D. F. Caldwell, F. J. Humenik, eds. 2006. St. Joseph, Michigan: ASABE. (doi:10.13031/2013.20268).

[35] Hans Pearl, Joseph Crosswell, Bryce Van Dam, *et al.*,"Two Decades of Tropical Cyclone Impacts on North Carolina's Estuarine Carbon, Nutrient and Phytoplankton Dynamics: Implications for Biogeochemical Cycling and Water Quality in a Stormier World", *Biogeochemistry* (2018) 141, 307–332. <https://doi.org/10.1007/s10533-018-0438-x>.

[36] Ibid.

[37] Ellyn Kail, "Stirring photos of animals in the aftermath of hurricane Florence (interview with Kelly Guerin)" Feature Shoot (14 November, 2018) <https://www.featureshoot.com/2018/11/stirring-photos-of-animals-in-the-aftermath-of-hurricane-florence/>.

[38] USDA, Livestock Indemnity Program (2022) <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/5800> accessed 7 March, 2023.

reimbursement scheme favors the CAFOs whose economies of scale are far greater as they spend less per animal to raise them to market.[39] The American obsession with widely accessible and unnaturally cheap meat, dairy, and eggs has made it a world leader in factory farming with 99% of all farmed animals being raised in these conditions.[40] As a result, the rubric for compensation reflects the fact that the nature of the market is heavily weighted towards encouraging the growth of CAFOs, thus perpetuating the lowest-welfare production systems to proliferate throughout the US and especially in North Carolina's flood-prone regions.

For a farmer of either a CAFO or small farm, the task of protecting their flocks and herds by evacuation and sheltering is a financially and logistically impossible task in most parts of the world, even in countries like the US in which storm evacuation routes are well-defined for human residents. Many farms choose to send animals to slaughter before the storm to depopulate as the most humane and financially beneficial option.[41] This prevents the need for carcass removal post-storm even if it means taking a little financial hit for slaughter at a lower-than-expected market weight. The reality of the food system these birds and pigs were born into is that they were set up from the start to die as infants. Their deaths at whatever age and by whatever means necessary are not regarded as paramount to either the producers or the consumers of these animals as long as the final product is safe by government regulations and profit is made. The food system relies on the ambivalence of consumers and producers for profit and production and as long as that is true, welfare laws are not going to reduce the growing number of animals ending up as rotting carcasses floating through flood waters.

Producer in NC had the choice of depopulation by early slaughter or insurance payouts rather than any incentive to evacuate and shelter their animals. Rather than encourage farmers to evacuate animals or even to allow the animals to escape to higher ground by leaving open barn doors before caretakers evacuate, insurance policies incentivize farmers to keep barns locked tight to facilitate an accurate head count of dead animals for reimbursement.[42] The 3.4 million birds and 5500 pigs killed in Hurricane Florence never had a chance to survive because public policy favors cheap meat over individual animal lives whether during a disaster or between them.

As the evidence of increasing CCRDs along the Atlantic coastline becomes irrefutable, the North Carolina Department of Agriculture and Consumer Services (NCDACS) has managed a Swine Floodplain Buyout program since 2000 which seeks to close down CAFOs in the 100-year floodplain areas of NC; only forty-three out of

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[39] Claire Kelloway, "After Florence, small farmers face major hurdles to federal relief." Civil Eats (5 October, 2018) <https://civileats.com/2018/10/05/after-florence-small-farmers-face-major-hurdles-to-federal-relief/> accessed 28 February, 2023.

[40] Kelly Anthis and Jacy Reece Anthis, "Global Farmed and Factory Farmed estimate", Sentience Institute <https://www.sentienceinstitute.org/global-animal-farming-estimates> accessed 28 February, 2023.

[41] De Paula Vieira, A., Anthony, R., "Reimagining Human Responsibility Towards Animals for Disaster Management in the Anthropocene." Chapter in: Bovenkerk, B., Keulartz, J. (eds) Animals in Our Midst: The Challenges of Co-existing with Animals in the Anthropocene. The International Library of Environmental, Agricultural and Food Ethics (2021), vol 33. Springer, Cham. <https://doi.org/10.1007/978-3-030-63523-7_13>.

[42] Alex Cerussi and Irina Anta, "Natural Disasters: considerations for animals in agriculture", American Bar Association (29 January, 2020) <https://www.animallawconference.org/wp-content/uploads/2020/10/Natural-Disasters_-Considerations-for-Animals-in-Agriculture.pdf> accessed 28 February, 2023.

138 producers invited ended up participating.[43] This program would close down feedlot operations and set up easements on the properties to eliminate any agricultural production with the need for waste lagoon construction. However, it allows grass-fed cattle operations on the property which does little to reduce risk to animals in the floodplain and instead only eliminates the inevitable lagoon spillage.[44] Over a dozen named storms have made landfall since Florence's arrival in 2018 and none have had animal mortality rates as high thanks to some buyouts in the floodplain. However, the risk continues as CCRDs increase in frequency and strength while the policy to reduce CAFOs has barely budged. Just as Disaster Risk Reduction (DRR) and hazard mitigation for human populations include moving or at least incentivizing moving inhabitants out of regions that are most prone to disasters, the same could apply to animal populations. One must consider that continuing to put millions of sentient beings into harm's way by allowing CAFO permits to continue in this region is absurd, expensive, and dangerous to the environment and human population. A sustainable development strategy for North Carolina's agriculture industry must take into account the preservation of delicate aquatic ecosystems like wetlands and estuaries, the protection of public health, and the continuity of economic development while it protects animals' lives[45].

2.3 Climate Change in the Arctic and Reindeer Herding Pastoralism

The common association between global warming and CCRDs is with soaring summer temperatures and stronger storms in the middle latitudes. However, shifting arctic weather patterns, rapidly disappearing sea ice, and the melting of permafrost have affected millions of animals and pastoralists near and north of the Arctic Circle due to global warming. The Yamal peninsula of Russia is a region that lies mostly above the Arctic Circle and is home to the Nened indigenous group which is comprised of predominantly nomadic reindeer herders. The Nened use reindeer for meat, milk, bones, and hides and are dressed and housed in mostly reindeer products while still using reindeer-pulled sleds for transport for most of the year.[46] 80,000 reindeer died of starvation in 2016; 61,000 died in 2013; and 20,000 died in 2006- all years for unusual winter rains during warm days that penetrated the snow layer before freezing.[47] Reindeer in normal winter conditions dig through the snow with their hooves to eat the mossy lichens and pasture underneath, but the ice layer brought on by unusually high temperatures caused the ground to be unreachable and thus their food source was cut off entirely for most of the winter. In addition to the lack of access to food, extremely high summer temperatures dried up many water sources and reduced pasture quality as it also melted ancient permafrost and released anthrax from melting reindeer carcasses. The 2016 anthrax outbreak caused the death of 2350

[43] North Carolina Department of Agriculture and Consumer Services (NCDACS), "Swine Floodplain Buyout" (2018) <https://www.ncagr.gov/SWC/easementprograms/SwineFloodplainBuyout.html> accessed 27 February, 2023.
[44] Ibid.
[45] David Godshalk, Timothy Beatley, Philip Berke, David Brower, Edward Kaiser, Charles Bohl, and MR. Matthew Goebel (1999) *Natural Hazard Mitigation: Recasting Disaster Policy and Planning*. p. 98. Island Press, Washington, DC.
[46] Florian Stammler, "Success at the Edge of the Land: Past and present Challenges for Reindeer Herders in the West Siberian Yamal-Nenetskii Automomous Okrug" *Nomadic Peoples*, vol. 6, no. 2, 2002, pp. 51–71. *JSTOR*, <http://www.jstor.org/stable/43123667> accessed 1 March, 2023.
[47] Siberian Times, "Mass Reindeer Deaths if No Early Warning System for 'Climate Change' Freak freezes" (17 November 2016) <https://siberiantimes.com/other/others/news/n0789-mass-reindeer-deaths-if-no-early-warning-system-for-climate-change-freak-freezes/> accessed 8 March, 2023.

reindeer. One child died, hundreds of people were hospitalized and evacuated, and all property of the herders was burned to contain the outbreak.[48]

While the Yamal is suffering life and livelihood-altering effects of climate change, the reindeer industry is also digging its own grave in other ways. In the current economy of the Yamal-Nenets Autonomous Region, the growth of profitability for reindeer antler sales has increased to the point that herders are growing their herds and not slaughtering them for meat to ensure that they can gather more antlers for sale year after year.[49] This means an already threatened set of resources for reindeer are further depleted as herds grow. All this has exacerbated the effects of the melting permafrost and the droughts from summer heat waves that deplete available grazing lands. Any winter rains that cause ice to cover the snow are catastrophic for tens of thousands of extra animals who slowly starve and then freeze to death.

Mitigation of the mass mortality of reindeer herds is being poorly regulated by the region's disaster management policymakers and by reindeer herding communities themselves while the warming of the region is only speeding up. The increased frequency of events such as these that take the lives of so many individuals requires that mitigation involves the drastic reduction in herd sizes and the rapid development of alternative livelihoods for Nened herders. In addition, early warning systems for these weather events are possible if a close watch is kept on the retreat of sea ice in the Barents and Kara Seas.[50] This can give up to two days' warning before these winter rains which then can initiate the mobile slaughterhouses thus preventing mass starvation of herds. These teams depopulate herds and sell their meat before the animals face a prolonged death from starvation that results in herders receiving no government compensation for the loss of starved animals.[51] The process of global warming leading to the irreversible decline in the levels of Arctic Sea ice-- and then increased winter temperatures and rain precipitation turning to ice-- is only going to get worse over the coming decades. Permafrost thaws and disease outbreaks are becoming the norm rather than exceptional events. It is safe to say that the reindeer populations and the Nenets -generations of which rely entirely on their herds for livelihoods- will no longer have any place in the Yamal region without drastically limiting herd sizes and preventing overgrazing at the very least.[52]

The literature used in this section describing this example of an Arctic CCRD focused exclusively on the destruction of livelihoods over discussing the implications of this mass casualty event on the individual animals under the care of the herders. This rhetoric is commonplace when discussing animal mortality in disasters as the following sections will show. Around 40% of the Nenet population are still practicing

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[48] Elena Liskova, Irina Egorova, Yuri Selyaninov, Irina Razheva, Nadezhda Gladkova, et al., "Reindeer Anthrax in the Russian Arctic 2016: Climatic Determinants of the Outbreak and Vaccination Effectiveness", *Frontiers in Veterinary Science* Vol. 8 (2021) <https://www.frontiersin.org/articles/10.3389/fvets.2021.668420> accessed 8 March, 2023.

[49] Alexander Pilyasov, Valeriy Kibenko, "The Phenomenon of Entrepreneurship in Reindeer Husbandry in Yamal: Assessment of the Situation, Paradoxes, and Contradictions. In: Mathiesen, S.D., Eira, I.M.G., Turi, E.I., Oskal, A., Pogodaev, M., Tonkopeeva, M. (eds) Reindeer Husbandry (2023), Springer Polar Sciences. Springer, Cham.

[50] Bruce Forbes, Tina Kumpula, Nina Meschtyb, et al., "Coping with a Warming Winter Climate in Arctic Russia: Patterns of Extreme Weather Affecting Nenets Reindeer Nomadism" Chapter in: Marie Roue, Douglas Nakashima, and Igor Krupnik (eds.), *Resilience Through Knowledge, Science, and Global Environmental Change,* pp. 217-232, Cambridge, Cambridge University Press (2022).

[51] Ibid (no. 47).

[52] Ben Guarino, "Starvation Killed 80,000 Reindeer After Unusual Arctic Rains Cut Off the Animals' Food Supply", *Washington Post* <https://www.washingtonpost.com/news/morning-mix/wp/2016/11/16/starvation-killed-80000-reindeer-after-unusual-arctic-rains-cut-off-the-animals-food-supply/> accessed 27 February, 2023.

nomadic reindeer herding and seasonal fishing, this livelihood being nearly unchanged for thousands of years in the Yamal Peninsula where crop agriculture is limited. The number of herders from the 2010 census was nearly 25,000 with herds counted at around 700,000.[53] The deaths of the tens of thousands of individual animals should not be discounted at the same time as considering the culture-altering changes happening to the nomadic Nenet people affected by a CCRD. While the Yamal is also home to 90% of Russia's natural gas output and an increasing portion of oil which has created many problems for Nenet herders, it is vital to acknowledge that these animals starving and freezing to death from the effects of a warming climate is also caused in large part by animal agriculture's greenhouse gases (GHG). The loss of both animal lives and entire indigenous cultures in areas far from the CAFOs of countries like the US or China cannot be ignored. Global warming is indeed global after all.

Fossil fuel extraction in the Yamal Peninsula is now also a contributing factor to disrupted herd migration routes and is causing nomads to move to cities and face unemployment, alcoholism, and rising suicide rates.[54] The movement of farming families to cities due to livestock losses can be deeply traumatic, especially for those with no education or other skills to use in an urban environment. The region's increasing loss of pasture productivity means an inevitable migration of nomads to sedentary life in the permanent settlements of the region. While this may lead to a host of new problems including inadequate housing, the need for vocational training, and job market development, these will have to be addressed as part of the long-term mitigation of melting permafrost and the increased frequency of winter rains[55]. As the end of reindeer herding as a viable livelihood comes near, these issues will need to be addressed.

2.4 Drought, Starvation, and Disease in the Horn of Africa

The Horn of Africa's (HOA) worst drought in 40 years began its fifth consecutive failed rainy season of March-May 2023.[56] This is the third drought in the region just in the past decade. Drought conditions have tripled in frequency between 1970-1979 and 2010-2019.[57] This prolonged drought is exacerbating the complex emergency that already exists across Kenya, Ethiopia, and Somalia which involves not only famine, but also civil conflict (particularly in Ethiopia), malnutrition-related disease outbreaks, political instability, internally displaced people (IDPs), and unstable food and fuel

[53] Atle Staalesen, "The Russian Arctic growth region", The Barents Observer (8 October, 2016) <https://thebarentsobserver.com/en/life-and-public/2016/10/russian-arctic-growth-region> Accessed 23 February, 2023; Minority Rights Group International, "Russian Federation: Nenets", World Directory of Minorities and Indigenous Peoples (2020) <https://minorityrights.org/minorities/nenets/> Accessed 8 March, 2023.
[54] Ibid.
[55] A M Ermakova (2021) *IOP Conference Series: Earth and Environmental Science*. 723 doi: 10.1088/1755-1315/723/4/042026.
[56] Office for the Coordination of Humanitarian Affairs (OCHA), "Horn of Africa: regional updates", OCHA (2023) <https://www.unocha.org/horn> accessed 2 March 2023.
[57] World Bank, "Climate Change Adaptation and Economic Transformation in Sub-Saharan Africa", *Africa's Pulse*, vol. 24 (Oct. 2021). <https://openknowledge.worldbank.org/server/api/core/bitstreams/34f98cfe-b27b-58ad-a0cb-99568577e730/content> accessed 1 March, 2023.

supplies and prices.[58] The resilience of the region to its frequent climate shocks is already low due to the Ukraine war commodity disruptions and the lingering effects of COVID-19 on the economy, but the pastoralist livestock farmers and millions of farmed animals are taking the brunt of these famine conditions. The UN World Meteorological Organization (WMO) reports that 11 million livestock have died from this drought up to February 2023 with many families losing entire herds.[59] The UN International Organization for Migration (IOM) reports that 16.3 million people are unable to access enough water for drinking, cleaning, and cooking; 2 million people are displaced; and 20 million people are facing severe food insecurity in this arid and semi-arid region.[60] Extreme poverty, political instability, an insufficient power grid, and poor healthcare infrastructure added to the lack of resources for animals such as accessible veterinary care and disease monitoring services make pastoralism and sedentary farming difficult even outside of drought periods. However, it is still among the few viable occupations for the rural poor in the HOA.

This complex emergency --one in which no mitigation strategy has yet prevented the necessity for protracted relief operations-- is getting worse for both humans and animals. While the arguments for defending pastoralism as a vital livelihood and food source have many facets, these need to take into account the unstoppable climate shocks in the HOA. The common arguments for pastoralist systems are that they effectively sequester carbon through grazing and that livestock make use of arid and semi-arid lands (ASAL) not viable for crop production.[61] Some defenders of pastoralism advocate for adaptions to livestock rearing such as developing concurrent agroforestry systems, mixing crop and livestock rearing, utilizing more drought-resilient breeds, and restoring grazing lands,[62] but none of these consider a replacement of this system for the humans and animals trapped in this farming method. The deeply speciesist policy of pastoralist livelihood protection at all costs to the farmed animals is problematic because providing jobs is not necessarily the same as poverty reduction. This can be seen from the extreme poverty, poor health care, and low literacy rates of pastoralists. This fact tends to be passed over when pastoralism is defended.[63] Protecting pastoralists does not need to mean protecting the system of pastoralist farming itself. To ensure that the way things have always been done (which has served neither herders nor animals well) continues is to perpetuate the cycle of suffering and death the animals in this food system experience during CCRDs. International organizations and governments can acknowledge that

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[58] USAID (13 December 2022) Horn of Africa- Complex Emergency <https://www.usaid.gov/sites/default/files/2022-12/2022-12-13_USG_Horn_of_Africa_Complex_Emergency_Fact_Sheet_3.pdf> accessed 10 March, 2023.

[59] UN World Meteorological Organization (22 February, 2023). Another poor rainy season forecast drought hit Horn of Africa. < https://public.wmo.int/en/media/news/another-poor-rainy-season-forecast-drought-hit-horn-of-africa> accessed 9 March 2023.

[60] UN International Organization for Migration, "East and Horn of Africa Regional Drought Response 2023" IOM (2023) <https://crisisresponse.iom.int/response/east-and-horn-africa-regional-drought-response-2023> accessed 1 March 2023.

[61] Uddin Md E., Kebreab Ermias, Review: Impact of Food and Climate Change on Pastoral Industries, Frontiers in Sustainable Food Systems, vol. 4, 2020 <https://www.frontiersin.org/articles/10.3389/fsufs.2020.543403>.

[62] World Bank, "Climate change adaptation and economic transformation in Sub-Saharan Africa", *Africa's Pulse* (Oct. 2021), vol. 24 <https://openknowledge.worldbank.org/server/api/core/bitstreams/34f98cfe-b27b-58ad-a0cb-99568577e730/content>; Dawson, I., Carsan, S., Franzel, S., et al., "Agroforestry, Livestock, Fodder Production and Climate Change Adaptation and Mitigation in East Africa: Issues and Options", ICRAF Working Paper No. 178. (2014) Nairobi, World Agroforestry Centre.

[63] Steinfeld (no. 46).

herders have few other viable employment options and work towards changing that specifically.

As seen in the previous examples, due to deeply engrained speciesism, none of these arguments or mitigation options address the individual animals who are not only drivers of climate change[64] but also are vulnerable and unprotected from CCRDs, have poor veterinary care if any at all, and are still victims of the food system from which there is no escape. The herds are discussed only as economic units and as factors of a traditional culture that is dying as the climate changes and animal farming becomes a less viable livelihood. The FAO, the UN's main animal agriculture oversight agency, has multiple reports detailing the environmental and public health disasters from both intensive and extensive livestock rearing in addition to disaster management guidelines for animals in disaster.[65] However, at no point in these reports are the animals discussed as individuals who are being exploited and killed while given little to no veterinary care. The eleven million animals who have died up to Spring of 2023 in the HOA since the beginning of the recent drought are not considered living beings in the literature. To discuss drought or other CCRD mitigation for animals without acknowledging their pain and suffering as individuals with an interest in survival is in stark contrast to the way most societies view cruelty to dogs and cats negatively. If eleven million puppies were killed in a drought, the public response would most certainly be different than it is when goats, cattle, and camels are dying of thirst and starvation.

While it is the animals that are suffering and dying in the highest numbers in this current drought, to ignore the plight of the farmers themselves is not the intention of this discussion. The mental health of pastoralists and sedentary farmers alike suffers greatly when faced with loss of livelihood from livestock losses.[66] [67] Job loss in any context can bring on stress, anxiety, depression, and even suicidal ideation. In regions like the HOA, the Yamal Peninsula, and most of the Global South, access to mental health services is extremely limited, even more so in such remote regions where pastoralists live. To balance the needs of both humans whose livelihoods are destroyed and the animals whose lives are taken by disease and starvation means that pastoralists' struggles – as well as those of other farmers throughout the world- have to be prioritized. Neither farmed animals nor their human caretakers fare well in CCRDs. Generations of people working as herders are currently and, more so in the future, losing their livelihoods while their livestock fail to survive the effects of CCRDs throughout the world. These people lack sufficient support to find alternative livelihoods in remote regions with few other options. In the HOA, there is simply no

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[64] Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., et al., "Tackling Climate Change through Livestock: A Global Assessment of Emissions and Mitigation Opportunities", Food and Agriculture Organization of the United Nations (2013) <http://www.fao.org/3/i3437e/i3437e.pdf> accessed 4 March, 2023.

[65] Ibid; Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M. and de Haan, C., "Livestock's Long Shadow: Environmental Issues and Options", Food and Agriculture Organization of the United Nations (FAO) (2006) Rome; Food and Agriculture Organization, "Livestock-Related Interventions During Emergencies: A How-to-Do-it Manual", Edited by Philippe Ankers, Suzan Bishop, Simon Mack and Klaas Dietze. FAO Animal Production and Health Manual No. 18. (2016), Rome.

[66] Nuvey, F. S., Kreppel, K., Nortey, P. A., Addo-Lartey, A., Sarfo, B., Fokou, G., Ameme, D. K et al. (2020). Poor mental health of livestock farmers in Africa: a mixed methods case study from Ghana. *BMC Public Health*, *20*(1), 825. <https://doi.org/10.1186/s12889-020-08949-2>.

[67] Sarah Cooper, Paul Hutchings, John Butterworth, Solome Joseph, Abinet Kebede, Alison Parker, Bethel Terefe, Barbara Van Koppen (2019) "Environmental associated emotional distress and the dangers of climate change for pastoralist mental health" *Global Environmental Change*, Volume 59 <https://doi.org/10.1016/j.gloenvcha.2019.101994> accessed 7 September, 2023.

turning back in terms of providing herds with a survivable environment- regardless of relief aid provided- thanks to the worsening climate crisis[68]. As a result, the farmers are facing the inability to provide their families with basic needs while consumers are being faced with food shortages. Without significant diversification of the livelihoods available in this region that are not livestock dependent, increased poverty and food insecurity, declining mental health, and high unemployment are all inevitable for those caught up in a food system they were born into. As the population of the African continent doubles by 2050[69], the reliance on an animal-based food system so sensitive to increasing drought conditions in the HOA needs to be called into question.

There are other options to be explored in the HOA that would save livelihoods, protect animals, and increase food security. Agroforestry, an agricultural method combining native tree planting with other agricultural production, is one excellent option for disaster resilience because not only does it diversify plant-based food production and the regeneration of soil quality of ASALs, but also because it has excellent potential for CCRD mitigation and is an alternative to livestock-based livelihoods. Trees break wind sheers, provide shade for crops, and prevent soil erosion. In the savannas of the HOA, this would be a step in the right direction away from fodder production and grazing land restoration. In drought and flood-prone regions, agroforestry and even rewilding savannas are opportunities to mitigate future climate shocks and increase food security while not wasting scarce resources on animal-based farming which the future climate cannot support.[70] While international organizations discuss water-intensive livestock fodder farming and increasing access to watering holes that are fast disappearing, agroforestry is a more sensible option.[71] This is not only due to drought, but also in part due to the difficulties of doing business under the conditions of competing water and fodder resources of sedentary ranchers, depleted market access due to veterinary restrictions and disease outbreaks, changing demand from urban markets, cattle raids, and political instability.[72]

As farmed animals face starvation from depleted grazing lands and their communal water sources dry up, their hungry and thirsty bodies also become less resistant to disease and pests. As mentioned, most animals in the HOA in the best of times lack access to veterinary treatment of any kind.[73] Pastoralists and their herds have difficulty accessing veterinary and laboratory services, and herders similarly lack healthcare access. With poor transport infrastructure in pastureland and only small

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[68] Haile, G. G., Tang, Q., Hosseini-Moghari, S.-M., Liu, X., Gebremicael, T. G., Leng, G., et al. (2020). Projected impacts of climate change on drought patterns over East Africa. *Earth's Future*, 8, e2020EF001502. <https://doi.org/10.1029/2020EF001502>.

[69] Ibid; Africa's population will double by 2050 (28 March, 2020). In *Africa: Special Report*. The Economist.

[70] Shem Juya, GW Sileshi, Eike Leudeling, FK Akinnifesi, Cory Whitney, et al., "Potential of Agroforestry to Enhance Livelihood Security in Africa", Chapter in: J. C. Dagar et al. (eds.), *Agroforestry for Degraded Landscapes: Recent Advances and Emerging Challenges - Vol. 1* (2020), <https://doi.org/10.1007/978-981-15-4136-0_4>.

[71] Mesfin Mekonnen, Arjen Hoekstra, "A Global Assessment of the Water Footprint of Farm Animal Products. *Ecosystems* (2012). 15, https://doi.org/10.1007/s10021-011-9517-8; Arjen Hoekstra, "Water for Animal Products: A Blind Spot in Water Policy", *Environmental Research Letters* (2014), 9. Doi: 10.1088/1748-9326/9/9/091003.

[72] Kate Dyer, "Pastoralism in the Horn of Africa: Diverse Livelihood pathways". Future Agricultures Consortium Policy Brief, <https://www.future-agricultures.org/wp-content/uploads/pdf-archive/CAADP%20Policy%20Brief%2006.pdf> accessed 20 August, 2023.

[73] Kula Jilo, Nejash Abdela, and Jemal Adem, "Insufficient Veterinary Service as a Major Constraint in Pastoral Area of Ethiopia: A Review", *Journal of Biology, Agriculture and Healthcare*, vol. 6:9 (2016) <https://www.law.ox.ac.uk/sites/default/files/migrated/oscola_4th_edn_hart_2012quickreferenceguide.pdf> accessed 2 March, 2023.

communities scattered over the savanna, veterinary surgeons, community animal health workers, and government animal health department staff simply do not have regular access to animals. There is no economically viable model for private or even public veterinary care when clients are so scattered. Herders are left to provide treatment without training, often using unregulated pharmaceuticals they aren't familiar with which can lead to antimicrobial resistance, overdoses, and more pain and suffering for the animals.[74] This makes monitoring the health of herds and providing vaccines and treatments to animals suffering in drought conditions extremely challenging.

Early intervention to reduce animal mortality in combined disease outbreaks and famine conditions is logistically impossible without fully mobile veterinary services and an increase of at least para-professional community animal health workers, if not large animal veterinarians. Regular vaccinations outside of emergency conditions are the best prevention for disease outbreaks but this requires an existing cold chain network and the disease surveillance systems and veterinary staff in place to execute regular herd vaccinations before the animals are starving and more vulnerable to disease.[75] Access to regular veterinary care is vital for disaster relief for animals and for protecting public health.

When famine conditions put pressure on food and water supplies, using those scarce resources for growing fodder for livestock rather than crops for human consumption in a drought-prone, food-insecure region wastes precious water resources and land while not increasing long-term food security for the human population. While currently 21 million people in the Horn of Africa are highly food insecure and the population lacks access to potable water and suffers from cholera and diarrhea,[76] using scarce water for land and water resource-intense herds that are not climate change-resilient is shortsighted in the face of the need for more effective water management and food production in frequent drought conditions. In this acute famine situation in which the preservation of human life is the highest priority, relief agencies focus on destocking prior to livestock starvation and for nutrition support.[77] As in the case of reindeer in the Yamal, herd destocking before mass starvation is more humane and saves more animal and human lives and relief funds than any program to attempt to increase the sustainability of a fundamentally unsustainable livelihood in the wake of increasing CCRDs. However, due to the lack of veterinary support and difficulty in getting starved and sick animals to slaughterhouses, this may not be an option.[78] In the case of the World Society for the Protection of Animals (WSPA- now World Animal Protection) relief in the state of Assam, India after floods in 2012, the early intervention of vaccinations, vitamin injections, and feed for the animals prevented the loss of tens of thousands of animals and thus the farmers' livelihoods, but that

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[74] Immaculate Omondi, Isabelle Baltenweck, Emmanuel Kinuthia, Leonard Kirui, et al., "Mobile Veterinary Clinics in the Drylands of Kenya: Securing Pastoralists' Livelihoods by Bringing Services Close", *Development in Practice* (2021), 31:5, 561-579, doi: 10.1080/09614524.2020.1863917.
[75] Trish Silken, "Veterinary Services in the Horn of Africa: Where Are We Now?" *Development in Practice* (2002), vol. 15:1, pp. 40–48. *JSTOR*, <http://www.jstor.org/stable/4030163> accessed 11 March, 2023.
[76] Fall, M., Dunford, M. Phiri, C. and Mbago-Bhunu, S. "The world cannot afford to ignore drought in horn of Africa", FAO Regional Office for Africa (14 November, 2022) <https://www.fao.org/africa/news/detail-news/en/c/1618945/>.
[77] FAO (18 August, 2011). FAO's preparedness and response to the Horn of Africa drought. <https://www.fao.org/fileadmin/templates/tc/tce/pdf/FAO_ongoing_response_to_the_drought_in_the_Horn_of_Africa.pdf> accessed 1 September 2023.
[78] LEGS 2014 (no. 54).

required effective access to the animals in question which is not as logistically simple as in a more densely populated area[79].

When/if the current drought conditions end in the HOA (and after millions more animals are expected to die in 2023), due to the lack of veterinary services available, the poor infrastructure for disease monitoring, and the lack of capacity of private and public investment in the veterinary industry in the region, it is important to address the problems associated with restocking herds in relief efforts. The process of disposing of millions of starved animal carcasses should be a wake-up call and an opportunity to expand livelihood diversification and address decreasing- rather than working to meet- the demand for animal-based food systems. This protracted drought is not a moment for governments and relief agencies to invest in restocking herds to return to yet another mass casualty incident for farmed animals in the next inevitable drought or other CCRD. Just as it is nonsensical to rebuild communities in severely disaster-prone areas, the same logic of avoiding imminent and repeated suffering for farmed animals in the HOA should apply. Restocking, however, remains the knee-jerk reaction recovery strategy to protect pastoralist livelihoods over the lives of millions of animals who are dying slowly and painfully in the HOA.[80] Restocking, as opposed to early intervention for existing herds, has been proven to be a less efficient use of relief funds in several disasters, but also perpetuates the poor welfare situation of the animals.[81] Animals that are restocked while conditions remain the same with poor vet care, lack of fodder/forage, and water scarcity will be returning to the same fate as those animals who had previously perished.

Shifting food systems, diversifying crop production, and ending the unsustainable reliance on farmed animals in the economy could have the most impact and be the most cost-effective mitigation strategy for both humans and animals. As the climate changes and extremes in temperatures and precipitation alter the landscape of the HOA, plant-based agriculture and agroforestry will need to play a bigger role in regional food security and livelihood development. Plant proteins from legumes and grains that tolerate drought better than livestock fodder/forage would increase food security without risking the lives of millions of farmed animals in CCRDs. Government and relief agency resources could be better utilized to assist in the transition of livelihoods from pastoralism to livelihoods that increase, rather than deplete, food security.

3 Mitigation and Recovery: Speciesism as a Hindrance to Long-Term Disaster Resilience

From a disaster management perspective, it is no longer logical to support animal agriculture in any system in the face of increasingly common CCRDs. The definition for mitigation, "the lessening or limitation of the adverse impacts of hazards and related disasters"[82] cannot be taken seriously without addressing the fact that the

[79] Economists at Large. (2014). *A benefit-cost analysis of WSPA's 2012 Intervention in the Dhemaji district of Assam India*.
[80] LEGS (no. 54); FAO 2016 (no. 46).
[81] Ibid (no. 8).
[82] "Guidelines on Disaster Management and Risk Reduction in Relation to Animal Health and Welfare and Public Veterinary Health: Guidelines for National Veterinary Services", World Organization for Animal Health (OIE) May 2016,
<https://www.woah.org/app/uploads/2021/03/disastermanagement-ang.pdf> accessed March 6, 2023.

greatest impact in terms of mortality is always the farmed animal deaths- both in terms of lives lost and economic losses. These victims have the least ability to escape confinement and protect themselves. To truly mitigate the effects of CCRDs on animals, the community of disaster management along with animal health and agriculture agencies need to reconsider supporting policies and production systems that are responsible for animal mass casualty incidents. Support for a food system resilient to CCRD shocks and safe for farmed animals in any part of the world will not include animal agriculture. Mitigation policy in the future will need to include reducing animal farming on flood plains like Eastern North Carolina, drought-prone regions such as the HOA, and on unsustainable, defrosting permafrost pasturelands such as in the Yamal. It is difficult to justify putting thousands of lives unnecessarily in harm's way regardless of whether they are human or animal.[83]

While demand for animal products continues to rise globally, so, too, does the accessibility of plant-based products and nutritional information regarding shifting to a diet that does not support the exploitation of animals in systems contributing to CCRDs while not being resilient to them. The WHO backs a shift to decrease animal products in diets to reduce health impacts from non-communicable diseases like cardiovascular disease, cancers, and diabetes which cause 71% of premature deaths globally.[84] While other UN agencies like the FAO continually support animal farming despite their reports about its devastating effects on animals, the environment, and public health, the WHO acknowledges that there has to be a global reduction in animal consumption to eliminate the environmental impact of animal agriculture's destruction of biodiversity and the climate.[85]

Recovery operations teach disaster managers so much about disaster risk reduction, but the lessons are not being heeded in animal protection. The definition of recovery is "the restoration and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors".[86] One cannot talk about DRR and recovery while ensuring that animals remain trapped in growing numbers in the same food system with all the same limitations for potential evacuation and shelter, with all the same risks to community public health, and with all the same ways that animals in animal agriculture contribute to and are affected by CCRD environmental destruction. Increased investment in the diversification of livelihoods, away from both extensive and intensive animal farming models and towards more sustainable and profitable plant-based agriculture would eliminate the loss of life and billions of dollars in recovery relief funds going towards managing the ever-more frequent animal mass casualty incidents. It is better policy to eliminate the problem than to respond and recover from it.

3.1 Speciesism and Logistical Limitations in Rescue Operations

Rescuing humans from disaster will always take precedence over animal rescue of any species, but in the US, the Pets Evacuation and Transportation Standards Act amendment to the Stafford Act (PETS Act), which was enacted after Hurricane Katrina

[83] Ibid (no. 6).
[84] "Plant-Based Diets and Their Impact on Health, Sustainability and the Environment: A Review of the Evidence", WHO European Office for the Prevention and Control of Noncommunicable Diseases (2021). Copenhagen: WHO Regional Office for Europe.
[85] Ibid 2021.
[86] OIE (no 59).

hit in August 2005, was a small step towards relief efforts for nonhuman animals.[87] The PETS Act provides federal relief coverage for FEMA and the municipalities, NGOs, and private companies involved in disaster relief to ensure emergency evacuation and sheltering for certain companion animals and service animals. Under this scheme, the costs to the state and local governments for companion animal disaster relief operations are reimbursed by federal disaster relief funds. In the US, these federal relief programs are engaged as the size of the disaster grows, however, meaning that if a disaster is smaller and managed only by local government or even state government without the need for federal intervention, it does not necessarily mean companion animals must be provided shelter. Each state varies in its capacity to evacuate and shelter animals along with the amount of integration of the PETS Act into local disaster management planning, and often this falls short of the initial intention of the act.[88]

The PETS Act was a step that resulted primarily from the fact that 44% of residents in Hurricane Katrina's path chose not to evacuate because they were not allowed to bring their companion animals.[89] Many companion animals had to be left behind to starve, drown in the floods, and fend for themselves due to the lack of facilities to shelter them and the fact that human shelters were turning them away. PETS was first and foremost a human protection measure, not a way to protect animals, and even if the effect of PETS did aid in protecting more animals in subsequent disasters, it completely ignored animals in animal agriculture, aquaculture, and labs as well as companion animals that are farmed animal species or exotics.[90]

Disaster response for animals can involve different equipment, different needs for sheltering facilities, and teams of veterinary and caretaking staff with training for the species they are working with. All of these are big asks for most disaster-affected communities around the world, even in industrialized countries with a higher level of veterinary capacity and first responders. Most small animal vets and vet staff in the US, for example, have little to no experience with avian medicine and rarely interact at all with farmed birds like chickens and ducks whether in backyard settings or CAFOs. Large animal medicine for cows and pigs is limited to reproduction, milk production, and slaughter rather than providing lifesaving care for these species that governments around the world categorize as "food animals". Large animal vets are trained to ensure food safety more so than alleviating animal pain and suffering, so in disasters, they are often available just for euthanasia for injuries rather than treatment or rescue. Without vets and experienced handlers of farmed animals, rescue operations including evacuation, sheltering, or post-disaster event rescue are impossible. Additionally, the PETS Act has excluded all reptiles, fish, amphibians, farmed animals, horses, and other non-traditional companion animals so there is no impetus for widescale training in the US for including these species in disaster

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[87] H.R.3858 - 109th Congress (2005-2006): Pets Evacuation and Transportation Standards Act of 2006 (October 6) <https://www.congress.gov/bill/109th-congress/house-bill/3858> accessed 10 March, 2023.

[88] Glassey, S. (2018). "Did Harvey learn from Katrina? Initial observations of the response to companion animals during Hurricane Harvey". *Animals*, (47), 1–9.

[89] Fritz Institute (2006). Hurricane Katrina: Perceptions of the Affected; Fritz Institute: San Francisco, CA.

[90] "The PETS Act: Companion Animals Affected by Natural Disasters", Animal Legal Defense Fund <https://aldf.org/article/the-pets-act-companion-animals-affected-by-natural-disasters/#:~:text=The%20PETS%20Act%20only%20provides,rabbits%2C%20rodents%2C%20and%20turtles> accessed 20 February, 2023.

management.[91] There are online and in-person courses for training for disaster relief for animals (FEMA has many options for training through their website), but as mentioned in the examples, farmed animals don't often get as many opportunities for evacuation as companion animal species so the focus tends to be on small animal handling (and sometimes equine victims) during rescue and relief operations.

Stressed large animals can be terrifying and often very dangerous, especially animals that are used for food and have no positive interaction with humans on a daily basis. Rescuing a 300-kilogram CAFO sow who has never seen the light of day from rushing flood waters is not the same process as rescuing a Golden Retriever from a flood. Driving a truck and trailer or lorry for large animal rescue transport is a less common skill than being able to drive a minivan full of kennels or even a boat with rescued small animals. Chickens are easily stressed birds with fragile bones, and while most of the planet eats them, relatively few people- even trained rescuers and vets- have ever even been in the room with one, much less had to catch, transport, shelter, feed, and medically treat hundreds of thousands of them while maintaining the vital biosecurity that housing large numbers of "food animals" requires.[92] As a result of these difficulties in disaster rescue response for farmed animals, often these animals are left to die or must fend for themselves rather than be rescued. While culturally in the US, the PETS Act may have initiated the inclusion of companion animals in disaster management, farmed animals remain far from the concern of the public.[93]

3.2 The Economics of Farmed Animal Disaster Response

In the US where 49% of family-run pig and poultry farms are under production contracts with large livestock companies, while the loss of individual animals may be insured, often the cost of culling and cleanup is covered by the property managers rather than the companies.[94] Family farms comprise most of the world's animal agriculture production, whether on contract with larger producers or privately owned, so the economic losses in livestock farming to these people can be devastating. Whether a family raises twenty goats per year for slaughter in Mongolia or a family has a CAFO with 200,000 chickens slaughtered every couple of months in North Carolina, farming animals is not a disaster-resilient occupation anywhere in the world and no subsidies or insurance policies have yet changed that.

The owners of CAFOs -whether contract farmers or actual animal owners- are above all concerned with protecting profit rather than saving the lives of animals whom they have bred to kill at a fraction of their natural lifespan. This is just the business of farming animals, even if farmers may have some emotional connection to their animals. The investment in disaster planning and the execution of disaster plans often cuts deeply into profits and saving animals costs more than the value of the

[91] LaVoy, E. (2019). The PETS Act and Beyond: A Critical Examination of the PETS Act and What the Future of Disaster Planning and Response for Animals Should Be. *Mitchell Hamline Law Journal of Public Policy and Practice*, 40.
[92] Leslie Irvine. (2021). Filling the Ark: Animal Welfare in Disasters. Temple University Press.
[93] Ibid (no. 88).
[94] James MacDonald and Christopher Burns, "Marketing and Production Contracts are Widely used in US Agriculture", US Department of Agriculture (1 July, 2019) <https://www.ers.usda.gov/amber-waves/2019/july/marketing-and-production-contracts-are-widely-used-in-us-agriculture/#:~:text=Only%208.1%20percent%20of%20U.S.,percent%20of%20farms%20with%20contracts> accessed 20 February, 2023.

animal at market.[95] As long as farmers are compensated through private and public insurance, there is little incentive to save lives that will be quickly cut short. Destocking is just the option that makes more financial sense in both intensive and extensive farming. Culling a herd or flock before a disaster is the least resource-intensive option for protecting profits while eliminating the drowning, starvation, freezing, etc. of the animals that they were going to eventually kill for profit.

Farmed animals are predominantly seen as just commodities by governments and farmers alike[96], an inevitable economic loss, none with any stake in the preservation of their own lives. This mentality is echoed in guidelines throughout disaster relief agencies, animal health institutions, farming organizations, and even most of society. Millions of chickens were killed along with 10,000 cattle (an estimated $30 million in losses) in Hurricane Katrina and the only legislation for animals to come out of that event protected only companion animals[97]. At the same time that Congress was working to rectify the loss of companion animals and their caretakers who did not evacuate, farmers in Louisiana and Mississippi were still busy loading trucks full of carcasses. The PETS Act clearly missed the point.

4 A Problem of Rhetoric: The Shift from Economic Units to Sentient Beings

Before disaster management guidelines can improve the fate of millions of animals caught in CCRDs, the language used to discuss farmed species has to change. Among the most detrimental aspects of disaster management to these animals is the dominant rhetoric in international and national level disaster management guides, legislation, and academic papers speaking of farmed animals in a way that reduces them to nothing more than units of production. Farmed animals are rarely addressed with the inclusion of their individual needs based on each sentient being's inherent interest in preserving their own life and avoiding suffering. While companion animal species and wildlife have the status of being worthy of protection at all levels of disaster management in much of the world, through a review of the literature and legislation, there are few voices in disaster management that acknowledge not only the suffering inherent in farmed animals caught in disasters but also the evidence that animal agriculture's contribution to climate change is second only to that of fossil fuels. Farmed animals are the drivers of CCRDs at the same time as they are victims of them. The dominant discourse centers on how relief agencies can continue to protect the ever-increasing supply of farmed animals in disaster zones in the same breath as listing the casualty statistics for animals in CCRDs.

4.1 Pastoralist Protections

> Emergency relief on its own will not reduce pastoral vulnerability. A different approach is needed to build capacity for drought preparedness

[95] Leslie Irvine, "Animals in Disasters: Issues for Animal Liberation Activism and Policy." *Animal Liberation Philosophy and Policy Journal* (2006), 4(1)
[96] Ibid, 42 (Kindle)
[97] Allison Clark (15 October, 2005) "Loss of Livestock Reaches Millions: Gulf Coast states assess damage to livestock caused by Hurricane Katrina. *American Veterinary Medical Association.* < https://www.avma.org/javma-news/2005-11-01/loss-livestock-reaches-millions> accessed 25 August, 2023

> in pastoral areas, which focuses on wealth and opportunity creation by investing in and promoting the development of pastoral areas.[98]

This quote is from the Humanitarian Policy Group speaking of threats to pastoralism in the HOA. As mentioned above in the discussion of the HOA drought, as of March 2023, over 11 million farmed animals are already dead from the multi-year drought currently plaguing the region. Yet this report is still promoting the development of pastoralism as a wealth-generating opportunity. The animals who died of thirst and starvation in a region prone to increasing CCRD risk are not even considered a factor in this paper. Animals are property, commodities, supposed wealth generation, and food security for the world's poorest farmers. Twenty million people in the HOA are dependent on pastoralist livestock farming for their livelihoods, people living at the most extreme end of the poverty scale who increasingly face water scarcity and food insecurity.[99] Rather than the preservation of human life, animal life, and the ecosystems that no longer can support this system, preserving a farming system that is unsustainable in this region and has never been an opportunity for escaping extreme poverty remains the goal of development organizations.

4.2 Animals as Assets

Only twice in the twenty-six pages of text of the UN Office for Disaster Risk Reduction's (UNDRR) Sendai Framework for Disaster Risk Reduction 2015-2030 does the word "animal" show up and it is only in this context:

> Priority 3: investing in disaster risk reduction for resilience, national and local levels. To achieve this, it is important: p.) to strengthen the protection of livelihoods and productive assets, including livestock, working animals, tools, and seeds…. Global and regional levels: To strengthen and promote collaboration and capacity-building for the protection of productive assets, including livestock, working animals, tools, and seeds.[100]

In both examples, animals are reduced to "productive assets". The fact that they, too, are sentient beings in need of protection from disaster no different than a human and are not, as they infer, merely units of production, has been disregarded in this document from one of the most renowned international agencies working in disaster mitigation. Animals, like a piece of machinery, a car, or a plant, are described as things to be used as inanimate objects that provide human owners with products to consume or profit from.

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[98] Humanitarian Policy Group, "Pastoralism, Policies, and Practice, in the Horn and East Africa: A Review of Current Trends", Overseas Development Institute (April 2019), London <https://cdn.odi.org/media/documents/4315.pdf>.

[99] The World Bank, "World Bank Boosts Support for Pastoralists in Horn of Africa", World Bank Press Release (18 March, 2018) <https://www.worldbank.org/en/news/press-release/2014/03/18/world-bank-pastoralists-horn-africa>.

[100] UNDDR (no 1).

4.3 Animal Advocacy Organizations Advocating Against Animals

World Society for the Protection of Animals (now World Animal Protection) wrote in their 2013 pamphlet, "Animals: Helping us Achieve the World We Want" and said this about livelihoods:

> The loss of animals in disasters can devastate livelihoods. The FAO recognizes that, 'The loss of livestock not only represents a loss of income for families, but also family savings and investment over many years. Livestock represents a safety net for many families and the loss of such productive assets will impact significantly on lives and livelihoods." Animal-related income streams are critical to the economic and social well-being in the world's poorest regions, in both rural and urban settings.[101]

Farmed animals have been living investments, insurance, collateral, and dowries for most of human history. They have been an asset that can be traded and used like currency and commodities. Despite this quote coming from an animal welfare organization, they have missed the fact that animals are living beings who suffer and have a vested interest in their well-being that is not related to human income. This prominent international animal advocacy organization -one that is heavily involved in disaster relief- failed to mention that when flood waters are rising, animals, like the humans that profit from their exploitation, have an innate desire to not drown just as any other living being would. This does not matter if they are of the "food animal" species.

The FAO, quoted above, was among the first UN organizations to put out a document ("Livestock's Long Shadow") detailing the detrimental effects of livestock on land degradation, biodiversity loss, water and air pollution, and the diversion of plant agriculture to fodder crops rather than crops for human consumption.[102] Even after detailing these effects and acknowledging the animal agriculture sector to not be disaster resilient or safe for the environment, public health, or the warming climate, the report only recommends focusing on technological advances to mitigate the effects of the increasing demand for meat rather than considering the individual lives that will be lost if society does not begin to reduce demand for animal products.

World Animal Protection's early intervention in the Assam, India flooding of July 2012 preserved the existing livestock trading market in the region in which over 1.7 million animals were affected. It was evaluated only by the economic value of the intervention rather than the benefit to the animals themselves.[103] The cost of the intervention with supplemental feeding and veterinary care was $49,324 with an estimated economic benefit from saving the lives and productivity of the animals treated by World Animal Protection at nearly $5 million USD[104]. This not only proves that treating and supplementing existing animals is better for the animals in the short term, but that in the end, they remain commodities that are traded for their flesh and secretions which are economically very valuable. This economic report never

[101] World Society for the Protection of Animals, (2013) "Animals: Helping Us Achieve the World We Want", WSPA (now called World Animal Protection) <https://sustainabledevelopment.un.org/getWSDoc.php?id=2748>.
[102] Steinfeld (no 46).
[103] Ibid (no. 79).
[104] Ibid.

acknowledges the animals as living beings, no differently than World Animal Protection itself. This on its own is problematic.

5 Conclusion

The lack of protection for farmed animal species during this unstoppable increase in CCRDs is a form of speciesism we see present in all aspects of society, even in animal protection movements, particularly welfarism rather than rights-based advocacy. Ignoring the rights of animals of any species to not be confined, repeatedly bred, and exploited for human use as property threatens the human population in the form of destruction of fragile ecosystems and by threatening public health through zoonoses; this is true in emergencies and non-emergency scenarios. Humans are intensifying animal agriculture and its associated greenhouse emissions globally and then fail to put in place ways to protect those animals from the CCRDs these activities are causing.

There are relatively few inhabited parts of the world in which humans have no access to arable land for the cultivation of food crops as human population centers tend to be the largest near access to reliable water sources and land suitable for growing food rather than just raising livestock.[105] As the climate changes, locations where crops can be produced and where food is accessible will inevitably change. The WHO said this in their most recent report on plant-based diets: "Considerable evidence supports shifting populations towards healthful plant-based diets that reduce or eliminate intake of animal products and maximize favorable 'One Health' impacts on human, animal, and environmental health".[106] While some UN organizations are putting everything on the line to support animal agriculture-based livelihoods despite their lack of disaster resilience,[107] the WHO acknowledges that this food system shift is the future. DRR strategies in all development sectors must take into account the larger picture that the expansion and intensification of animal agriculture are too costly to both humanity and animals to stand behind anymore as we watch CCRDs intensify in strength and increase in number.

In the human context of DDR looking at the drivers of disaster vulnerability, a recent example is the impoverished neighborhoods of people with no means to evacuate such as the 9th ward in New Orleans prior to Katrina. Like farmed animals, humans living in extreme poverty and living in housing that cannot survive the shocks of floods, wind damage, or seismic damage are just as vulnerable. Broiler chickens stuffed into farms by the tens of thousands that are living on flood plains such as in eastern North Carolina, trapped in buildings unable to withstand hurricane-force winds and raging flood waters, and for whom there is no escape other than the slaughterhouse truck are vulnerable in a way that can only be rectified by the elimination of that system of production in the first place. The reason they die in such high numbers is because the food system as it stands today requires them to live under those conditions to ensure the population has access to cheap meat above all considerations for the welfare of the animals and their vulnerability in the face of CCRDs. These animals are exposed to significant risk and then we collectively fail to acknowledge that the millions of lives lost in disasters are our fault.

While not discounting fossil fuels' contribution to climate change in the Arctic and around the world even in countries without fossil fuel extraction at the level of the

[105] Barry Klinger and Sadie Ryan, "Population Density Within the Human Climate Niche", *PLOS Climate (October 2022)*, vol. 1:11.
[106] WHO (no. 60).
[107] Ibid (no. 98).

Yamal Peninsula, global meat demand continues to rise, and animal agriculture and its carbon footprint has only intensified over the past fifty years. From the literature review, it is clear that disaster mitigation strategies for CCRDs typically avoid addressing the contribution of animal agriculture to GHG and climate change while simultaneously avoiding the topic of transitioning to more climate-friendly and disaster-resilient occupations and food systems. When the rhetoric and policy changes in the world's largest organizations to reflect a warming world and protect all its inhabitants, we will see a drastic reduction in farmed animal mortality.

Conflict of Interest Statement: The author is the founder and director of Vietnam's only farmed animal sanctuary and rescue and a vegan for over a decade. In addition to studying animals in disaster for her Master's of Emergency and Disaster Management, she worked extensively with horses in the hurricane-prone US Gulf Coast. These experiences plus the overwhelming evidence have shaped her views on the plight of farmed animals in disasters.

A Proposal: Protecting Military Working Dogs from Lasting Effects of War-Induced Trauma and Internalized Stress

Jessica A. Chapman*

Abstract: This article proposes that certain deleterious physical conditions Military Working Dogs develop while serving militaries are a result of the relationship between the stressful nature of their work, and their bodies' response to that stress, through their experienced trauma, internalized stress (high cortisol levels), and anxiety. Subsequently, this article proposes methods to ameliorate those deleterious physical conditions by improving Military Working Dogs' welfare during their military service.

Keywords: Military Working Dogs (MWDs); trauma; trauma-informed; gastropexy; Gastric Dilatation and Volvulus (GDV); military.

1 Introduction

> "The capability they (military working dogs) bring to the fight cannot be replicated by man or machine. By all measures of performance their yield outperforms any asset we have in our inventory. Our Army (and military) would be remiss if we failed to invest more in this incredibly valuable resource."
>
> — General David H. Petraeus (United States)[1]

Military working dogs (MWDs) are an integral part of militaries' successes in war theaters. They execute missions that militaries deem too dangerous for humans, and they do so without vocalized complaint or rebellion. As a result, MWDs operate in environments that expose them to extensive trauma, which leads to their development of internalized stress and mental illness. Despite their following commands, MWDs are frequently afflicted with physical internal injuries throughout their military tenure.

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[1] ANDREW L. MCGRAW & TODD M. THOMAS, MILITARY WORKING DOGS: AN OVERVIEW OF VETERINARY CARE OF THESE FORMIDABLE ASSETS, *in* WORKING DOGS: AN UPDATE FOR VETERINARIANS 933 (Maureen McMichael & Melissa Singletary eds., 2021).

Militaries, particularly United States (US) militaries, have implemented some practices to decrease the rate of MWDs' experienced injuries and deleterious conditions, to improve MWDs' general welfare. However, the military life still leads to premature deaths and early retirement for MWDs. Despite militaries' appreciation for MWDs, militaries often perceive them as tools or resources they can use for human benefit. If militaries continue using MWDs, current care toward, and perspectives of, MWDs must change. MWDs' longevity requires militaries to work with animal behaviorists and scientists to develop innovative solutions that promote MWDs' health and welfare, and that protect them from psychological and physical injuries.

This article will review one particularly devasting injury for MWDs: Gastric dilatation and volvulus (GDV). When not immediately addressed, GDV leads to intense suffering, pain, and frequently, death. GDV is an internal condition that afflicts MWDs as well as dogs whom humans use in other stressful environments. Sadly, it is a condition for which veterinary and medical experts have not determined a definitive cause. This article will argue that GDV may be a physical manifestation of MWDs' internalized stress and anxiety that results from the trauma they experience in war theaters, but from which they do not have the ability or necessary resources to effectively cope and mentally recover. This article will address this discussion in four sections. Part II of this article will review MWDs' background; their development of GDV; the lack of viable replacements for MWDs that could protect them from welfare concerns military service pose; and precautionary strategies militaries incorporate into MWDs' lives to protect them from GDV. Part III will interrogate potential, underlying causes of GDV, specifically connecting trauma, internalized stress, and anxiety to the condition. Part IV will propose alternative solutions to militaries' current precautionary measures, to prevent GDV development. It will include research ideas that could improve MWDs' welfare and lived experiences while serving countries that may also prevent GDV. And, Part V will provide concluding thoughts and potential applications for this discussion.

Militaries from countries throughout the world use MWDs, but not all countries openly publish data on the subject. Additionally, many studies focus on GDV, gastropexy, and MWDs' causes of death, but these studies come from a variety of countries and eras. This article, therefore, strives to create a comprehensive picture of MWDs and their relationship to GDV that is based on available studies whose research foci overlap, but whose foci and sources are not always the same. This article will primarily present data and statistics from sources that studied US MWDs because the US has one of the largest militaries in the world (third in active military personnel at 1,390,000[2] and the highest military spending as of 2021[3]), and because most of the studies that were available used US military data. Some animal advocates who are concerned about the welfare of MWDs request data through public records requests to their respective countries, in an attempt to disclose information about MWDs.[4] Thus far, provided data is vague or incomplete.[5] However, as MWDs' welfare increases in priority, perhaps more complete data will become publicly available, and animal

[2] Statists Research Department, *Largest armies in the world by active military personnel 2022*, STATISTA (Jan. 12, 2023), https://www.statista.com/statistics/264443/the-worlds-largest-armies-based-on-active-force-level/#:~:text=In%202022%2C%20China%20had%20the,the%20top%20five%20largest%20armies.

[3] Niccolo Conte, *Ranked: Top 10 Countries by Military Spending*, VISUAL CAPITALIST (Aug. 18, 2022), https://www.visualcapitalist.com/ranked-top-10-countries-by-military-spending/.

[4] *See, e.g.*, Alex Noronha, public records requests for Brazil's military sects and law enforcements' use of MWD. On file with author.

[5] *Id.*

behaviorists, scientists, and advocates throughout the world will be able to shed light on issues regarding MWDs and propose innovative solutions to improve MWDs' well-being.

2 Background

2.1 General Information Regarding Military Working Dogs (MWDs)

Purpose. Military working dogs have several crucial responsibilities that protect their human compatriots. Indeed, militaries train MWDs to execute and operate in "some of the most stressful situations while in war and combat."[6] For instance, the US military's special forces train MWDs to become 'multi-purpose canines' (MPCs), to find explosives, identify and chase human targets, identify hidden threats, rappel from helicopters, parachute from airplanes, perform nautical operations, execute search and rescue missions, patrol protected areas, and assist in dangerous raids.[7] Through their work, militaries expose MWDs to extreme levels of heat and gunfire, and train MWDs to be aggressive on command.[8] This training and conditioning arguably desensitize MWDs to humans and dangerous situations. Since desensitization to dangerous situations and violence has shown to increase violent behavior and perpetuate emotional numbing in humans,[9] MWDs are likely experiencing the same negative emotional effects through their military training and fieldwork. Because of MWDs' "extraordinary sensory capabilities," they complete tasks humans cannot, which inclines some experts to anticipate militaries will increase their use of MWDs in coming years.[10]

Though MWDs' responsibilities are heroic, these tasks expose MWDs to intense levels of physical, mental, and emotional stress, which MWDs often respond to by developing trauma, and then developing Post-Traumatic Stress Disorder (PTSD).[11] For instance, one anecdote regarding the MWD Oreo, shows that Oreo likely developed PTSD as a result of his role in locating bombs and identifying explosive devises in Iraq.[12] Military (human) personnel frequently develop PTSD from their war experiences—the percentages of PTSD in military personnel vary by year, but were as high as twenty-nine percent at some point in a veteran's life from Operations Iraqi Freedom and Enduring Freedom[13]—which manifests as physical, emotional, and

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[6] Sarah Ohlms *This is why Navy SEALS and Delta Force take dogs on capture-kill missions against terrorist leaders*, INSIDER (Oct. 31, 2019), https://www.insider.com/how-us-military-trains-dogs-navy-seal-delta-force-missions-2019-10.

[7] *Id.*

[8] *Id.*

[9] Noni K. Gaylord-Harden et al., *Examining the Effects of Emotional and Cognitive Desensitization to Community Violence Exposure in Male Adolescents of Color*, 87 AM. J. ORTHOPSYCHIATRY 463, 466 (2017) (citing J. Garbarino et al., *What children can tell us about living in danger*, 46 AM. PSYCHOLOGIST 376-383 (1991)).

[10] Laura Miller et al., *Causes of Death in Military Working Dogs During Operation Iraqi Freedom and Operation Enduring Freedom, 2001-2013*,183 MIL. MED. e467, e467 (2018).

[11] Ohlms, *supra* note 7.

[12] Kyle Stock, *The Dogs of War Are in High Demand*, Aug. 28, 2017), https://www.bloomberg.com/news/features/2017-08-28/military-dogs-are-becoming-an-increasingly-precious-weapon.

[13] PTSD: National Center for PTSD, *How Common is PTSD in Veterans?*, U.S. DEP'T VETERAN AFF. (last updated Feb. 3, 2023), https://www.ptsd.va.gov/understand/common/common_veterans.asp#:~:text=At%20some%20point%20in%20their,of%20100%2C%20or%206%25).

psychological symptoms.[14] So too, do MWDs display symptoms of PTSD, which veterinarians, dog trainers, and dog specialists at Lackland Airforce Base (the US military training headquarters for MWDs) have confirmed.[15] These symptoms include MWDs becoming fearful of loud noises, increasing aggression, forgetting ways to complete tasks, and choosing—or not being able—to work and complete missions.[16]

Breeds and favored qualities. Countries use a variety of dog breeds as MWDs, however, they most commonly use German Shepherds, Belgian Malinois, Labradors, Terriers, and mixed breeds.[17] Militaries source puppies from MWD suppliers, and select candidates because of their physical abilities.[18] Once candidate dogs complete military training, militaries choose graduates who have excelled in their ability to execute targeted aggression, their speed and agility, and their ability to survive extreme heat.[19] Dogs' inherent traits enable them to fulfill these demanding expectations and to handle the physical, mental, and emotional rigors of military work. However, such vigorous requirements seem to be factors that would instigate mental, physical, and emotional stress within any dog over time, regardless of their natural capabilities. As seen with athletes and military personnel, sentient beings physically, mentally, and emotionally degenerate when they endure long periods of exposure to stress and exert high levels of physical performance.[20]

Countries that use MWDs. Countries that use MWDs include the US, Britain, the People's Republic of China (China), Russia, Ukraine, New Zealand, Iran, Israel, India, France, and Australia.[21] MWD data is not available for every country. Though some countries' data can provide insight into MWDs' presence in militaries. For instance, the US maintains approximately 1,500 to 2,500 MWDs in active service at any given time,[22] seven hundreds of whom the US military deploys to overseas missions.[23] For China, one source states the country employs ten thousand MWDs at any given time, in five thousand army divisions.[24] Lastly, public records requests to

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[14] *PTSD*, U.S. DEP'T VETERAN AFF. (last visited Mar. 20, 2023), https://www.maketheconnection.net/conditions/ptsd/; *Understanding and Dealing With Combat Stress and PTSD*, MIL. ONSOURCE (Mar. 4, 2022), https://www.militaryonesource.mil/military-basics/wounded-ill-injured-and-caregivers/understanding-and-dealing-with-combat-stress-and-ptsd/.

[15] Ohlms, *supra* note 7.

[16] *Id.*

[17] Rebecca Frankel, *War Dogs of the World*, FOREIGN POL'Y (Apr. 27, 2012), https://foreignpolicy.com/slideshow/war-dogs-of-the-world/ (depicting MWDs who work for various countries' militaries).

[18] Ohlms, *supra* note 7.

[19] *Id.*

[20] *See, e.g.*, Agorastos Agorastos et al., *Developmental Trajectories of Early Life Stress and Trauma: A Narrative Review on Neurobiological Aspects Beyond Stress System Dysregulation*, 10 FRONTIERS PSYCHIATRY 1, 2 (2019); KELLEY J. SLACK ET AL., CHAPTER 1: RISK OF BEHAVIORAL AND PSYCHIATRIC CONDITIONS, *in* HUMAN HEALTH AND PERFORMANCE RISKS OF SPACE EXPLORATION MISSIONS 11 (Jancy C. Mcphee & John B. Charles eds., 2009); *generally* Elissa S. Epel et al., *More than a feeling: A unified view of stress measurement for population science*, 49 FRONTIERS IN NEUROENDOCRINOLOGY 146-169 (2018) (all listed literature describing the detrimental effects of psychological and physical stress can have on humans, in various situations).

[21] Frankel, *supra* note 18.

[22] Kristin Houser, *Military dogs may soon sport AR goggles in enemy territory*, FREETHINK (Oct. 10, 2020), https://www.freethink.com/technology/military-dogs; Michael Lagutchik et al., *Trauma Management of Military Working Dogs*, 183 MIL. MED. 180, 180 (2018). These numbers may vary depending on the cited source and year.

[23] Lagutchik et al., *supra* note 23, at 180.

[24] *More than 10,000 Military Working Dogs Serve in Chinese Army*, CHINA TODAY—EXPLAINING CHINA TO THE WORLD (last visited Mar. 22, 2023), http://www.chinatoday.com.cn/ctenglish/se/txt/2011-12/30/content_417647.htm.

the Brazilian government indicate that the country's army, navy, and air force used 918 MWDs in one year, as of November 2022.[25] Those numbers likely flux, but may be representative of similarly positioned countries. Countries use MWDs in other branches of government besides war-focused militaries, including local and regional law enforcement, military police, and special operations units.[26] The private use of MWDs and non-military working dogs is also becoming more prevalent; some individuals are purchasing working dogs who receive near-MWD training for home security, and for private corporations.[27]

Cost and training. Expense data is not available for all countries, but the US spends between $40,000 to $283,000 to purchase and train one MWD.[28] Other countries' expenditures on MWDs' procurement and training may be similar. Dogs entering the US military spend approximately 120 days in training to become MWDs.[29] The US and other militaries may require additional training for specialized roles.

MWDs' career statistics. Militaries hope each MWD's tenure lasts eight to ten years, during which time they will complete dozens of missions and multiple deployments.[30] On average, militaries prematurely retire their MWDs when they reach 6.5 years because of physical injuries (i.e., excessive wound bleeding, collapsed lungs, and amputations) and developed illnesses.[31] Many MWDs do not reach militaries' planned retirement age because they die prematurely in the field.[32] However, some studies indicate MWDs *can* live to an average age of eight to ten years,[33] but they usually have developed an illness or serious injury. For instance, one New Zealand study found that forty percent of its MWDs reached the planned retirement age of eight years, but that GDV was a "significant cause of death".[34] Another study on US MWDs' deaths from 1993 to 1996 indicated that 76.3 percent of deaths or imposed euthanasia on these animals occurred because of "appendicular degenerative joint disease [(osteoarthritis, 19.2 percent)], neoplasia [(abnormal tissue growths that may likely be cancerous in cases that led to death[35], 18.3 percent)], spinal cord disease [(15.6 percent]), nonspecific geriatric decline [(old age, 14.1 percent)], gastric dilation-volvulus [(GDV, 9.1 percent, also the focus of this article])," and cardiac disease (3.7 percent).[36]

To compare military career ages at early retirement or death to ages of dogs in general populations, the average life spans for dog breeds militaries most frequently

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[25] Alex Noronha, public records request. On file with author.
[26] Lagutchik et al., *supra* note 23, at 180.
[27] Andrea Chang, *A $150,000 'executive protection dog'? Rich L.A. homeowners are snapping them up*, L.A. TIMES (Mar. 1, 2023), https://www.latimes.com/business/story/2023-03-01/protection-dogs-security.
[28] Ohlms, *supra* note 7; Stock, *supra* note 13.
[29] Stock, *supra* note 13.
[30] Ohlms, *supra* note 7; AJ Worth et al., *Causes of loss or retirement from active duty for New Zealand police German shepherd dogs*, 22 ANIMAL WELFARE 167, 167 (2013); Lagutchik et al., *supra* note 23, at 180.
[31] Ohlms, *supra* note 7; Worth et al., *supra* note 31, at 170.
[32] Worth et al., *supra* note 31, at 170; Stock, *supra* note 13.
[33] Miller et al., *supra* note 11, at e471 (citing George E Moore et al., *Causes of death or reasons for euthanasia in military working dogs: 927 cases (1993-1996)*, 219 J. AM. VETERINARY MED. ASS'N, 209-14 (2001)).
[34] Worth et al., *supra* note 31, at 172.
[35] *Neoplasm*, NAT'L CANCER INST. (last visited Mar. 20, 2023), https://www.cancer.gov/publications/dictionaries/cancer-terms/def/neoplasm.
[36] Moore et al., *supra* note 33, at 209-11.

use are: German Shepherd—nine to thirteen years[37]; Belgian Malinois—ten to fourteen years[38]; Labradors—ten to twelve years[39]; and Terriers (depending on the sub-breed)—eight to fifteen years[40].

Legal status. At least within the US, the country's federal government used to classify MWDs as 'equipment' with the same status as military weapons and transport vehicles.[41] A member of the US House of Representatives introduced a bill in 2012 that recognized MWDs as "canine members of the Armed Forces" and no longer classified MWDs as equipment.[42] This enacted legislation enables the US military to transport MWDs back to the US after deployment (rather than being euthanized[43] or abandoned in their country of deployment[44]); enables the US military to work with nonprofits to adopt retired MWDs to forever homes; provides retired MWDs with necessary veterinary care; and formally recognizes MWDs who died in action.[45] This legislative recognition of MWDs' sentience and welfare during retired life is noble, but it responds to MWDs' needs *after* their military service. The legislation does not respond to MWDs' welfare needs while they are enlisted. Therefore, legal status-wise, US militaries still effectively treat MWDs as inanimate equipment during service.

In the same vein, some animal advocates and academics have argued for international governing entities to change the legal status of animals used in war—such as MWDs—to anything more than their current legal status, which is one that does not exist.[46] Proposed "international legal and global norms" exist regarding MWDs' welfare because of their participation in international conflicts.[47] However,

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[37] *German Shepherd Lifespan: How Long Do German Shepherds Live?*, ANYTHING GERMAN SHEPHERD (last visited Mar. 22, 2023), https://www.anythinggermanshepherd.com/how-long-do-german-shepherds-live-and-ways-to-make-the-most-of-it/.

[38] Brittany Grenus, *Belgian Malinois*, PET MD (Nov. 7, 2022), https://www.petmd.com/dog/breeds/belgian-malinois.

[39] Vicki Adams et al., *Exceptional longevity and potential determinants of successful ageing in a cohort of 39 Labrador retrievers: results of a prospective longitudinal study*, 58 ACTA VETERINARIA SCANDINAVICA 1, 1 (2016) (showing in some studies Labradors can live as old as sixteen or seventeen years).

[40] Jamie Lovejoy, *How Long Do Dogs Live?*, PET MD (Jan. 3, 2023), https://www.petmd.com/dog/care/how-long-do-dogs-live (though some sources indicate terriers can live to be as old as eighteen or twenty-three years).

[41] Sarah D. Cruse, *Military Working Dogs: Classification and Treatment in the U.S. Armed Forces*, 21 ANIMAL L. REV. 249, 251 (2015) (citing 10 U.S.C. §§ 101-18506 (2012) *and* 10 U.S.C §§ 2576, 2583 (2012)).

[42] *H.R.4103 – Canine Members of the Armed Forces Act*, CONGRESS.GOV (last visited Mar. 20, 2023), https://www.congress.gov/bill/112th-congress/house-bill/4103?r=1 [hereinafter H.R.4103].

[43] Larisa Epatko, *Military Working Dogs: What Happens After They Serve?*, PBS (May 28, 2012), https://www.pbs.org/newshour/nation/military-working-dogs#:~:text=To%20find%20out%2C%20we%20spoke,dogs%20were%20euthanized%2C%20she%20said.

[44] Angelo Fichera, *What We Know About the Claims of Military Dogs Left in Kabul*, FACTCHECK.ORG (Sept. 21, 2021), https://www.factcheck.org/2021/09/what-we-know-about-the-claims-of-military-dogs-left-in-kabul/.

[45] *Canine Members of the Armed Forces Act*, ANIMAL WELFARE INST. (last visited Mar. 20, 2021), https://awionline.org/content/canine-members-armed-forces-act; H.R.4103, *supra* note 43. The Canine Members of the Armed Forces Act is now enacted in 10 U.S.C. § 2410r, 10 USC § 2583, and 10 U.S.C. § 994.

[46] Karsten Nowrot, *Animals at War: The Status of "Animal Soldiers" under International Humanitarian Law*, 40 HIST. SOC. RES. 128, 128 (2015).

[47] AM. BAR. ASS'N, REPORT TO THE HOUSE OF DELEGATES 104B 6 (2020), https://www.animallawconference.org/wp-content/uploads/2021/10/2020-ABA-MWD-104B.pdf. *See also* H. Golledge, *The welfare of dogs and cats involved in commercial practices: a review of legislation across EU countries*, 24 ANIMAL WELFARE 360, 360 (2023) (explaining that the European Union does have legislation that regulates the welfare of animals used in commercial practices, but has

international bodies of law have not yet officially provided MWDs with a legal status, let alone a legal status that recognizes MWDs' sentience.[48] Indeed, at the time of this article's writing, animals, generally, who work in military theaters have not received international legal recognition, despite collective societies' acknowledgement of their critical importance to countries' military efforts.[49] For these reasons, most—if not all—militaries are not legally required to improve the lives and welfare of MWDs. Rather, improvements for MWDs seem to come from evolving cultural perspectives that MWDs deserve better treatment and welfare standards than those they receive thus far.

MWDs' welfare and militaries' environmental effects on them. 'Animal welfare' is commonly considered a measure of the quality of an animal's lived experience that depends on an animal's well-being. However, some scientists who have researched animal welfare as it applies to MWDs understand the concept as an animal's "lived experience": As the "quality of life or how the animal is feeling," which is "informed by positive or negative experiences" that derive from their "nutrition, environment, physical health, [and] behavioral interactions."[50] Animal welfare scientists compare these variables with animals' mental states to determine the influence the variables have on animals' experiences.[51] Animal welfare needs are species-specific. However, all species exhibit behaviors that are beneficial or detrimental to their well-being when they are thriving or in deleterious situations, respectively. For instance, dogs who experience positive animal welfare, and who exhibit beneficial behavior (i.e., exhibiting contentedness and being calm), have the ability to play and interact with other dogs, rest when they desire, eat when they desire, and receive mental and social stimulation.[52]

Dogs who do not have exposure to appropriate amounts of animal welfare-measured variables exhibit deleterious, stereotypic behaviors—"a repetitive, invariant behavior pattern with no obvious goal or function"[53]—including "circling, pacing, whirling, jumping, wall bouncing, repetitive grooming or self-biting, polydipsia [(excessive drinking)] or polyphagia [(excessive eating)], compulsive staring" and excessive barking.[54] Stereotypic behaviors increase animals' propensity to become injured or to become prone to disease.[55] A day in the life of MWDs demonstrates a much more restrictive life—with limitations on important animal welfare variables—than the type of life many dogs who serve as companion animals experience. These

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enacted less legislation regulating the welfare of dogs as companion animals, because disparities would arise between EU member states if such legislation was enforced. Concern for similar disparities may arise with the EU enacting a legal status for dogs, even MWDs.).

[48] Marco Roscini, *Animals and the Law of Armed Conflict*, 47 ISR. Y.B. 35, 38 (2017). Because international governing bodies have not drafted or enacted legislation regarding MWDs, citable legislation does not exist to prove this argument. Rather, academic articles discussing this issue are the most available citable source.

[49] Frankel, *supra* note 18.

[50] Mia L. Cobb et al., *The Animal Welfare Science of Working Dogs: Current Perspectives on Recent Advances and Future Directions*, 8 FRONTIERS VETERINARY SCI. 1, 2 (2021).

[51] *Id.*

[52] *Welfare of dogs: normal behavior patterns*, NIDIRECT:GOV'T SERVS. (last visited Mar. 20, 2023), https://www.nidirect.gov.uk/articles/welfare-dogs-normal-behaviour-patterns.

[53] Nora Philbin, *Towards an Understanding of Stereotypic Behaviour in Laboratory Macaques*, ANIMAL WELFARE INST. (last visited Mar. 20, 2023), https://awionline.org/content/towards-understanding-stereotypic-behaviour-laboratory-macaques#:~:text=What%20is%20stereotypic%20behaviour%3F,no%20obvious%20goal%20or%20function.

[54] Mark J. Prescott et al., *Refining dog husbandry and care*, 38 LABORATORY ANIMALS 1, 25 (2004).

[55] *Id.* at 25.

restrictions may decrease MWDs' general welfare. For instance, military personnel muzzle MWDs whenever personnel handle them.[56] Police dogs in New Zealand only receive food once a day for "logistical reasons," and do not have guaranteed rest periods because they are on call for emergencies.[57]

In 2014, to improve MWDs' welfare, the US military implemented the use of kennels that are temperature-controlled and that provide dogs space to go outside and to exercise.[58] However, depending on combat and deployment conditions, such kennels are not always available.[59] Instead, militaries use Vari Kennels, which are portable, open-air kennels, that have limited space and are kept within troops' barracks to protect dogs from extreme temperatures.[60] These kennels prevent dogs' free range of movement, keep them isolated from each other, and prevent them from executing species-specific behaviors, creating environments that are deleterious to dogs' behavioral and mental cognition since they are pack animals who require social interactions.[61] Through forced isolation and confinement in small areas, MWDs may develop stereotypic behaviors, which increase internalized stress and anxiety in dogs, and arguably, may exacerbate reactions to experienced trauma that promote dogs' development of mental illnesses. To compare, examples of external factors that cause stereotypic behaviors in laboratory animals include limited space in a contained area, stressful environments, isolated housing, and the absence of environmental stimulation.[62] The conditions in which laboratory animals and kenneled MWDs live seem very similar.

When MWDs are on missions, they have virtually no control over the tasks that are asked of them, nor do they have the ability to consent or refuse to perform, which can induce emotional and physical discomfort, and instigate unhealthy levels of internalized stress.[63] In other words, the environments within which MWDs work cause several mental and physical injuries which often lead to the development of degenerative disorders, preemptive surgeries, hospitalizations that involve rehabilitation and/or surgery (i.e., appendage amputations), early retirement, or premature death.[64] These environments and welfare conditions, compounded with the stress and traumatic experiences MWDs endure on missions, create a perfect formula for MWDs to develop trauma-related mental illnesses, including anxiety and PTSD.[65]

From military personnels' perspectives, militaries treat MWDs "like gold."[66] However, anecdotal evidence suggests that like gold, militaries consider MWDs to be highly beneficial tools, equipment, or expendable resources—"assets" that need to "last" the military "at least eight or nine years."[67] These references toward MWDs may indicate respect for the advantages MWDs provide militaries. But, such references do not indicate a recognition and appreciation for MWDs' existence as sentient creatures

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[56] Lagutchik et al., *supra* note 23, at 180.
[57] Worth et al., *supra* note 31, at 172.
[58] Audra Calloway, *New deployable kennels for military working dogs mitigate temperature extremes*, JOINT BASE LANGLEY-EUSTIS (Apr. 21, 2014), https://www.jble.af.mil/News/Article-Display/Article/844147/new-deployable-kennels-for-military-working-dogs-mitigate-temperature-extremes/.
[59] *Id.*
[60] *Id.*
[61] Prescott et al., *supra* note 55, at 25-26.
[62] Philbin, *supra* note 54; Prescott et al., *supra* note 55, at 25-26.
[63] Cobb et al., *supra* note 51, at 3.
[64] Ohlms, *supra* note 7.
[65] *Id.*
[66] Stock, *supra* note 13.
[67] *Id.*

who require cognitive, emotional, and physical well-being to survive their missions, let alone thrive. Furthermore, though nonprofits started by former military personnel work to rehabilitate retired MWDs so they can find homes after their service,[68] these rehabilitation efforts occur after MWDs have undergone military-induced trauma, internalized stress, and injury. The key for promoting MWDs' well-being is for militaries to facilitate environments for MWDs that improve their welfare *during* their tenure, which could help them execute their missions while simultaneously experiencing mental, emotional, and physical stability.

2.2 Robot Dogs as an Alternative to Avoid Issues Surrounding MWD Welfare, but Fail to Fulfill MWDs' Roles and Abilities

MWDs are invaluable to militaries: They complete jobs militaries do not assign or cannot assign to humans. The prospect of militaries choosing to stop using MWDs in the near future seems unlikely. Though some MWD welfare advocates with whom this article's author has spoken to have expressed hope that robot dogs could replace MWDs because of the welfare issues that surround MWDs' experiences in the military theatre, robot dogs are not the solution that will fulfill that desire.

The 'Vision 60' by Ghost Robotics, which militaries commonly refer to as 'robot dogs,' are machines Ghost Robotics designed to execute "remote inspection, [i]ntelligence, [s]urveillance, [r]econnaissance (ISR) missions, mapping, distribute[] communications, and [ensure] continual security."[69] However, robot dogs do not currently have the ability to replace MWDs and pose ethical concerns. Robot dogs have the capacity to patrol territories and scout new areas (i.e., battlefields and bodies of water) to protect military and law enforcement personnel from unknown dangers (i.e., landmines or disasters); to investigate objects of interest; and to carry sensors.[70] Militaries use robot dogs to "patrol areas that 'aren't desirable for human beings and vehicles,'"[71] which "free people up to handle other tasks that robots can't do."[72] US militaries use these robots frequently, yet, information regarding their available technologies is not widely publicized, given their classified role.[73]

These machines may mimic dogs' skeletal structure, but they do not function like MWDs, though Ghost Robotics has stated such aspirations. Robot dogs exist "strictly for bomb disposal, scoping out perimeters, and identifying threats."[74] They are not meant to fill the same roles that MWDs do. Indeed, their developers consider them "quadruped unmanned ground vehicle[s]" and even avoid referring to them as

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[68] *Id.*

[69] Tom Fish, *US Air Force: 'Unstoppable' Army trials AI robot dogs to defend bases –'Next-gen warfare'*, EXPRESS (Sept. 10, 2020, updated 7:14 AM), https://www.express.co.uk/news/science/1333295/us-air-force-robot-dogs-army-defend-military-bases; Joseph Trevithick, *Military 'Robot Dogs' Can Now Be Equipped To Swim (Updated)*, WARZONE (Jun 13, 2022, 5:42 PM), https://www.thedrive.com/the-war-zone/robot-dogs-can-swim-now.

[70] Fish, *supra* note 70; Trevithick, *supra* note 70; Gino Spocchia, *Company behind robot-dogs headed to US-Mexico border insists they cannot malfunction*, INDEPENDENT (Feb. 21, 2022, 4:44 PM), https://www.independent.co.uk/news/world/americas/robot-dogs-us-mexico-border-b2019706.html.

[71] Brett Tingley, *Here is What the Air Force's New Robot Dogs Are Actually Capable Of*, WARZONE (Dec. 15, 2020), https://www.thedrive.com/the-war-zone/38000/here-is-what-the-air-forces-new-robot-dogs-are-actually-capable-of.

[72] Kristin Houser, *Robot dogs are being deployed at a US military base*, FREETHINK (Dec. 13, 2020), https://www.freethink.com/technology/robot-dogs.

[73] Fish, *supra* note 70.

[74] Houser, *supra* note 73.

dogs.[75] Robot dogs cannot sniff out drugs, bombs, or landmines, and they cannot perform rescue missions. They cannot see without a person remotely watching through them; they are equipment operated by humans from a distance.[76] Also, robot dogs were not designed to interact with humans.[77] These machines collect data and are extensions of military personnel,[78] rather than being critically thinking, independent, non-human soldiers.

Robot dogs present serious ethical considerations, particularly regarding whether using them with limited artificial intelligence against humans is appropriate. Because these robots can carry equipment, militaries could attach small firearms or munitions to them, which would allow militaries to remotely use weapons in areas that are difficult to access, with precision.[79] This scenario is concerning, particularly since the US is considering using this technology to patrol and surveil controversy-ridden areas like the US-Mexico border.[80] Though such technology may seem logical in war theaters, using this technology on unarmed humans anywhere in the world to advance one nation's military goals verges on surpassing the threshold of ethical warfare.[81] MWDs are certainly trained to cause harm to and control people, which presents ethical considerations as well. But, MWDs are living, sentient beings that understand human stress, experience empathy, and can choose not to act. In contrast, robot dogs operate under the complete direction and discretion of humans who are not physically present to critically assess situations. And, for this reason, using robot dogs as tools to potentially control other human beings is problematic. Though one Ghost Robotics consultant believes robot dogs will replace MWDs in the field because they are supposedly less expensive than purchasing, training, and maintaining MWDs,[82] robot dogs' and MWDs' capabilities and surrounding ethical considerations suggest otherwise.

To note, scientists from Florida Atlantic University's Machine Perception and Cognitive Robotics Laboratory developed another robot dog of sorts, named 'Astro', which they built for "military applications" and to "serve as a scout."[83] Though scientists equipped Astro with "over a dozen sensors including optical, auditory, olfactory, gas, and radar," artificial intelligence capabilities, and its "key missions include detecting guns, explosives and gun residue to assist police, the military, and security personnel," information about this robot's integration into militaries does not seem to exist after 2019.[84] Furthermore, despite the additional sensory technology, such equipment presents the same ethical considerations as the Vision 60.

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[75] James Wharton, *Watch: Is this robot the future for military dog handlers?*, FORCES (Sept. 16, 2021, 4:30 PM), https://www.forces.net/technology/watch-robot-future-military-dog-handlers.
[76] Spocchia, *supra* note 71.
[77] *Id.*
[78] Fish, *supra* note 70.
[79] Tingley, *supra* note 72.
[80] Catherine E. Shoichet, *Robot dogs could patrol the US-Mexico*, CNN (Feb. 19, 2022), *border*https://www.cnn.com/2022/02/19/us/robot-dogs-us-mexico-border-patrol-cec/index.html#:~:text=The%20photos%20look%20like%20a,how%20it's%20testing%20the%20technology.
[81] The discussion of whether warfare is inherently unethical is a conversation for a different article.
[82] Wharton, *supra* note 76.
[83] Kea Grace, *Astro the Robot Dog Could Replace All Kinds of Working Dogs*, ANYTHING PAWSABLE (Dec. 7, 2019), https://anythingpawsable.com/astro-robot-dog-sar-police-military-assistance/.
[84] *Id.*

2.3 Gastric Dilatation and Volvulus (GDV)

2.3.1 GDV's Development

GDV is a "life-threatening condition" that occurs in 3.9 to 36.7 percent—recorded through hospital admissions—of general dog populations.[85] The condition occurs suddenly, starting with gas building pressure within a dog's stomach, which is then followed by the dog's stomach dilating, and then rotating or twisting.[86] The combined gastric pressure, stomach dilatation, and stomach rotation compress the dog's abdominal vessels.[87] Consequently, blood cannot reach the dog's stomach or digestive organs, which prevents food digestion and causes stomach distention, which then prevents circulating blood to pump to the dog's heart.[88] This process deprives the dog's tissues from blood and oxygen, and as the tissues die, they release toxins into the dog's bloodstream, which causes "impaired cardiac output" (heart arrhythmia or heart rhythm disturbances).[89] Within four hours, a dog suffering from GDV will go into shock and will require emergency corrective surgery (gastropexy[90]), at which point a veterinarian will sew the stomach to the internal lining of the dog's abdominal wall.[91]

2.3.2 Causes

Scientists and veterinarians have not definitively identified the root causes of GDV development; studies and results from GDV research do not provide clear answers. Rather, experts theorize on suspected causes, which include: A dog's breed and size (as of one 2020 study, specifically, large breeds—"great danes, Akitas, Saint Bernards, Dogue de Bordeaux, Gordon setters, Irish setters, standard poodle, basset hound, Doberman pinscher, old English sheepdog and Weimaraners"—because these breeds experience the highest rates of GDV in general populations[92]); physical shape (a deep chest that may allow the stomach to rotate[93]); birth sex and neutering status; diet, including ingesting fermentable foods that cause abnormal amounts of gas[94] or being fed dry kibble[95]; eating patterns, including consuming food quickly or overeating; drinking patterns, including high levels of water consumption; older age (seven-year-old dogs tend to develop GDV at twice the rate as two to four-year-old dogs); physical activity patterns (exercising after eating); increased body weight as well as lean body weights; stomach-related illnesses; genetic predispositions through family histories and "immune-derived issues"; residence in certain countries; birth dates in the 1990s; seasons (winter versus summer, fall, or spring); atmospheric pressure and pressure

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[85] Ignazio S. Piras et al., *Identification of Genetic Susceptibility Factors Associated with Canine Gastric Dilatation-Volvulus*, 11 GENES 1313, 1313 (2020). Percentages may differ slightly between studies.
[86] *Id.* at 1; *Bloat and the Risk Factors*, CANADIAN KENNEL CLUB (June 7, 2022), https://www.ckc.ca/en/The-Dish/June-2022/Bloat-and-the-Risk-Factors.
[87] Piras et al., *supra* note 86, at 1313.
[88] *Id.*; CANADIAN KENNEL CLUB, *supra* note 87.
[89] Piras et al., *supra* note 86, at 1313; CANADIAN KENNEL CLUB, *supra* note 87.
[90] *Infra* Section II(c)(iv).
[91] Piras et al., *supra* note 86, at 1313.
[92] *Id.* at 1314; I. Uhrikova et al., *Risk factors for gastric dilatation and volvulus in central Europe: an internet survey*, 60 VETERINARNI MED. 578, 578 (2015) (quoting a list of breeds from a 1994 study that included German Shepherds because the breed is large).
[93] Piras et al., *supra* note 86, at 1313; CANADIAN KENNEL CLUB, *supra* note 87.
[94] *Bloat*, KENNEL CLUB (last visited Mar. 20, 2023), https://www.thekennelclub.org.uk/health-and-dog-care/health/health-and-care/a-z-of-health-and-care-issues/bloat/.
[95] Marko Pipan et al., *An Internet-based survey of risk factors for surgical gastric dilatation-volvulus in dogs*, 240 J. AM. VETERINARY MEDICAL ASS'N 1456, 1456 (2012).

changes; daily temperatures; living as a companion animal; spending at least five hours a day with a human guardian; being cared for by a person who is not the dog's guardian; being kept outside all day; kenneling; riding in a car; temperament (excitability or fearfulness propensities); "visiting, travelling, and changing location"; and most consistently noted—anxiety, which would include aggression towards people, and "fearfulness or agitation in response to strangers or environmental changes."[96] Many of these factors describe dogs' traits or habits generally, rather than identifying peculiar variables that could cause GDV. Furthermore, every available study includes a slightly different list of suspected variables. Indeed, many researchers and dog specialists openly admit they do not understand the reasons GDV occurs.[97] To note, some of these behaviors and habits align with stress-induced stereotypic behaviors mentioned in the previous section: Pacing, whirling, jumping, wall bouncing (exercising at the wrong time), excessive drinking, and excessive eating.

Anxiety is the only suspected mental health-related cause of GDV, and it is the most consistently suspected cause listed in available studies.[98] In contrast, research shows that calmer dogs—less anxiety—have decreased rates of GDV compared to dogs who experience frequent stress and anxiety-ridden situations.[99] One speculation is that dogs—and most animals generally—tend to swallow a lot of air when they are anxious, a behavior that dogs who are stressed and held in kennels often exhibit.[100] This air intake balloons the stomach, which then alters the organ layout within a dog's abdomen.[101] This speculation underscores the way that mental health and physical behaviors can interact to cause physical injury: The dog's internalized stress and anxiety are the initial reason they swallow air, which then causes the stomach to develop GDV. Arguably, the hypothesized reasons listed in the previous paragraph that cause GDV could also be variables that cause internalized stress and anxiety, depending on the dog's base temperament. Being a dog—being a living, sentient being—is stressful and anxiety-ridden. Perhaps all and none of the proposed causes induce GDV. Rather, GDV's development is unique to every dog's lived experience and whether that experience causes the dog stress that they are not able to manage without developing a physical condition in response. To further illustrate the connection between stress, anxiety, and GDV development, GDV is not only a frequent condition among MWDs, it is a frequent condition among dog populations whom humans use to perform tasks in other stressful environments, including law enforcement initiatives (policing), search and rescue missions, and hunting expeditions.[102]

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[96] Piras et al., *supra* note 86, at 1314; Pipan et al., *supra* note 96, at 1456 (this study noted that the following factors showed a decreased risk for dogs developing GDV: "playing with other dogs and running the fence after meals, fish and egg dietary supplements, and spending equal time indoors and outdoors"); Michael Levine & George Moore, *A time series model of the occurrence of gastric dilatation-volvulus in a population of dogs*, 5 BMV VETERINARY RES. 1, 1 (2009); CANADIAN KENNEL CLUB, *supra* note 87; Uhrikova et al., *supra* note 93, at 578-79; CLARENCE A. RAWLINGS, INCISIONAL GASTROPEXY TO PREVENT AND TREAT CANINE GASTRIC DILATATION-VOLVULUS, *in* COMPENDIUM: CONTINUING EDUCATION FOR VETERINARIANS E1(2013).

[97] KENNEL CLUB, *supra* note 95; Levine & Moore, *supra* note 97, at 1; Pipan et al., *supra* note 96, at 1456.

[98] Ohlms, *supra* note 7.

[99] CANADIAN KENNEL CLUB, *supra* note 87.

[100] KENNEL CLUB, *supra* note 95.

[101] *Id.*

[102] Katherine E. Jones et al., *generally* Worth et al., *supra* note 31; *Search-and-rescue dogs: an overview for veterinarians*, 225 J. AM. VETERINARY MEDICAL ASS'N 854, 858 (2004); Nancy Anisfield, *Canine Concerns: Hunting Dogs Face Risks Most House Pets will Never Encounter*, COVEY RISE (Feb. 12, 2021), https://coveyrisemagazine.com/canine-concerns-hunting-dogs-face-risks-most-house-pets-will-never-encounter/.

The lack of definitive causes, the fact that anxiety is the most consistent factor on experts' list of suspected causes of GDV, and the fact that dogs in traumatic environments experience high levels of stress and in turn, exhibit high levels of anxiety, lead to the following hypothesis regarding a major cause of GDV: MWDs, and dogs in general populations who experience traumatic situations that induce high levels of internalized stress, experience higher rates of anxiety, mental illnesses, and GDV than dogs who live in calm environments. Therefore, GDV may actually be a manifested physical reaction to the trauma and subsequent internalized stress such dogs experience. Just as MWDs develop PTSD from their work as a psychological symptom—or coping mechanism—to trauma, GDV may be a physical coping mechanism to their military work. GDV may occur because MWDs do not have access to resources that can help them recover from trauma and calm their internalized stress and anxiety. If MWDs, and other dogs who experience high levels of stress, have the ability to utilize healthy coping mechanisms rather than internalize stress because of exposure to traumatic experiences, these dogs' rates of GDV may decrease and their lived experiences and welfare may improve. Upcoming sections in this article will further explore this hypothesis. The following subsection on GDV statistics will also illustrate this hypothesis by showing the stark contrast of GDV's presence in MWD populations versus general dog populations.

2.3.3 Statistics (Based on Available Studies)

General statistics. Depending on the study, GDV develops in 3.9 to 36.7 percent of dogs[103]; or 0.3–1.2 percent of general dog populations,[104] twenty-four percent of large breed dogs,[105] and 21.6 percent of giant breed dogs[106]. Dogs who experience GDV, but who do not receive immediate corrective surgery have an eighty percent chance of GDV recurring, and have an average survival rate of six months.[107] Some studies show that dogs who develop GDV and receive surgical treatment experience a mortality rate of sixteen, eighteen, and twenty-four percent,[108] or as one study showed, a survival rate of eighty-five percent.[109] Data indicates that five to six percent of dogs with GDV will experience its recurrence after surgery.[110] And, veterinarians euthanize, or see pass away, ten to forty-four percent of dogs with GDV who need emergency intervention.[111] Great Danes experience the highest rates of developing GDV at 42.4 percent.[112] Given the high mortality rate of dogs who experience GDV, including those who receive emergency care, prophylactic surgical solutions to prevent GDV from occurring initially seem like a logical approach to ensuring the health and well-being of at-risk dogs.

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[103] Piras et al., *supra* note 86, at 1313.
[104] Uhrikova et al, *supra* note 93, at 578.
[105] CANADIAN KENNEL CLUB, *supra* note 87.
[106] *Id.*
[107] Piras et al., *supra* note 86, at 1313.
[108] RAWLINGS et al., *supra* note 97, at E1 (rates may differ slightly between studies).
[109] Michael P. Ward et al., *Benefits of prophylactic gastropexy for dogs at risk of gastric dilatation-volvulus*, 60 PREVENTIVE VETERINARY MED. 319, 319 (2003).
[110] CANADIAN KENNEL CLUB, *supra* note 87; Piras et al., *supra* note 86, at 1313; RAWLINGS, *supra* note 97, at E1; Uhrikova et al., *supra* note 93, at 578.
[111] Piras et al., *supra* note 86, at 1313.
[112] CANADIAN KENNEL CLUB, *supra* note 87.

Military Working Dog statistics. The US Airforce reported that GDV is MWDs' second leading cause of death behind cancer.[113] Indeed, one study that reviewed data from 2001 to 2013,[114] found "diseases" (conditions) were the second most common cause of death in working dogs at twenty-three percent.[115] Of those conditions, the most common one was GDV, which affected one in eleven MWDs.[116] This study aligns with an earlier study that was conducted on data from 1993 to 1996, that showed MWDs' most common reason for euthanasia or death derived from GDV.[117] Though Brazil's records regarding MWDs do not seem consistent or complete, (several dogs' deaths were "unknown"), Brazil's militaries attributed GDV as a cause of death for its MWDs at a rate of 9.5 to 11.11 percent from 2017 through 2021.[118]

Once US militaries required veterinarians to perform prophylactic surgery on all MWDs beginning in 2009/2010, the rate at which MWDs developed GDV decreased to twenty-three percent.[119] Some experts suspect German Shepherds as working dogs have a predisposition for developing GDV.[120] However, this data seems skewed because militaries primarily use German Shepherds as MWDs[121]; militaries do not have GDV data for other breeds—that experts believe have a high risk of developing GDV in general dog populations—to compare their German Shepherd data to. Furthermore, German Shepherds are not on cited lists of breeds in general populations that experts believe GDV commonly afflicts.[122] In fact, data regarding German Shepherds' genetic predisposition for developing GDV "did not yield any significant results."[123] Therefore, German Shepherds' development of GDV seems influenced by external environmental factors, rather than any genetic predispositions.

2.3.4 Surgical Solutions for GDV

Many human guardians of dogs—whose breeds are considered at risk for suffering from GDV—choose to pursue prophylactic gastropexy to prevent GDV development. Before GDV has the opportunity to develop, veterinarians surgically tack or sew the

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[113] Raymond Hoy, *Incirlik defender receives preventive surgery*, U.S. AIR FORCES IN EUROPE & AIR FORCES AFRICA (Aug. 31, 2009), https://www.usafe.af.mil/News/Article-Display/Article/255051/incirlik-defender-receives-preventive-surgery/ (the sourced article does not list the cited studies).

[114] The study's authors recognize this data includes MWDs who started receiving prophylactic gastropexy, which may have skewed its data analysis and underrepresented the prevalence of GDV in MWDs before such surgery became mandatory. The authors recognize the rate at which MWDs experienced GDV may have decreased after 2010. Miller et al., *supra* note 11, at e471.

[115] *Id.* at e467; One study found the rate at which MWDs experience GDV is ten percent. Robert Vogelsang, *Care of the Military Working Dog by Medical Providers*, 7 J. SPECIAL OPERATIONS MED. 33, 39 (2007). The study's authors recognize this data includes MWDs who started receiving prophylactic gastropexy, which may have skewed its data analysis and underrepresented the prevalence of GDV in MWDs before such surgery became mandatory.

[116] Miller et al., *supra* note 11, at e471.

[117] *Id.* at e468.

[118] Alex Noronha, records on file with author. If "unknown" causes of death are included in these calculations, the rates of GDV could increase to as high as 15.78 to 30.76 percent from 2017 through 2021.

[119] Lagutchik et al., *supra* note 23, at 186.

[120] *See, e.g.*, Kate Hill, *Gastric Dilatation And Volvulus In Working Dogs*, SMALL ANIMAL VETERINARY ASS'N (2013), https://www.vin.com/apputil/content/defaultadv1.aspx?pId=11372&catId=35321&id=5709943 (explaining German Shepherds' large size and deep chests make them vulnerable to GDV).

[121] Ohlms, *supra* note 7.

[122] Piras et al., *supra* note 86, at 1314.

[123] *Id.* at 1325.

stomach permanently to the side of the body's internal wall, which prevents the stomach from twisting.[124] Veterinarians can perform this surgery as an open surgery, (cutting open a dog's skin through a large incision to access the stomach), or through a laparoscopic procedure, (multiple tiny incisions to access a dog's stomach).[125] Recovery from prophylactic surgery can require two to three days, but may take multiple weeks, particularly if the dog undergoes open surgery.[126] Though prophylactic surgery decreases the risk of GDV, it presents ethical considerations for veterinarians who, by performing the surgery, might mask underlying causes that instigate GDV and other conditions.[127]

Gastropexy can increase the rate of conditions that are painful and dangerous, and that injure other internal organs, such as mesenteric volvulus and vessel dilatation.[128] Mesenteric volvulus is a condition in which a dog's large intestine experiences similar symptoms a stomach experiences during GDV[129]: The large intestine will suffer from sudden gastric pressure, dilate, and then rotate, which causes "abdominal distension, pain, vomiting, constipation, and bloody stools" as well as fever and the cutoff of blood circulation.[130] The fact that the large intestine experiences the same symptoms the stomach would experience if it was not tacked to the abdominal lining is a strong indication that gastropexy is a metaphorical band aid to prevent GDV. Gastropexy may prevent physical symptoms from manifesting in a dog, but it does not address the root causes of GDV. Otherwise, the large intestine would not suffer the same fate. And, unfortunately, mesenteric volvulus is not an uncommon condition MWDs experience. One study found that MWDs who undergo prophylactic gastropexy, or other abdominal surgery, have a higher risk of developing mesenteric volvulus as a postoperative complication, compared to dogs who do not undergo such surgeries.[131] The study also suggests German Shepherds have a higher propensity for developing mesenteric volvulus.[132] As mentioned in the previous section, perhaps the correlation between German Shepherds as a breed having a propensity to develop mesenteric volvulus exists because the majority of MWDs are German Shepherds who undergo prophylactic gastropexy, rather than the breed being genetically prone to such a condition. Though US military-purchased dogs receive prophylactic surgery, dogs

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[124] Malcom Weir & Catherine Barnette, *Gastropexy*, VCA ANIMAL HOSPS. (last visited Mar. 20, 2023), https://vcahospitals.com/know-your-pet/gastropexy.

[125] *Gastropexy, Elective*, DALLAS VETERINARY SURGICAL CTR. (last visited Mar. 20, 2023), https://dvsc.com/medical_library/elective-gastropexy/; *Preventing Torsion When Bloating with Prophylactic Gastropexy*, AM. KENNEL CLUB CANINE HEALTH FOUND. (Sept. 26, 2011), https://www.akcchf.org/canine-health/your-dogs-health/caring-for-your-dog/prophylactic-gastropexy.html (these surgeries include belt-loop gastropexy and circumcostal gastropexy).

[126] D.J. Brockman, *A Protocol for Management of Acute Gastric Dilation-Volvulus Syndrome in the Dog*, WORLD SMALL VETERINARY ANIMAL ASS'N (2007), https://www.vin.com/apputil/content/defaultadv1.aspx?id=3860693&pid=11242&print=1#:~:text=Intensive%20post%2Doperative%20care%20is,and%20may%20be%20life%20threatening; *Gastric Volvulus and Dilatation*, ANIMAL SURGICAL CTR. MICH. (last visited Mar. 20, 2023), https://www.animalsurgicalcenter.com/gastric-volvulus-and-dilatation.

[127] Ward et al., *supra* note 110, at 319.

[128] RAWLINGS, *supra* note 97, at E1; Piras et al., *supra* note 86, at 1313.

[129] Carol K. Le et al., *Volvulus*, in *StatPearls [Internet]*, NAT'L LIBR. MED. (last updated Sept. 12, 2022), https://www.ncbi.nlm.nih.gov/books/NBK441836/#:~:text=Introduction-,Volvulus%20occurs%20when%20a%20loop%20of%20intestine%20twists%20around%20itself,may%20be%20insidious%20or%20sudden.

[130] *Id.*

[131] Shane J. Andrews et al., *Investigation of potential risk factors for mesenteric volvulus in military working dogs*, 253 J. Am. Veterinary Medical Ass'n 877, 877 (2018).

[132] *Id.*

whom militaries contract from private companies do not consistently receive preemptive surgery and so, they still experience GDV.[133]

Prophylactic surgery prevents the loss of significant financial investments to purchase, raise, and train MWDs. But, performing prophylactic surgery does not take into account the mental and physical trauma dogs may experience by undergoing surgery, including "stress-induced activation of the sympathetic nervous system, hemodynamic compromise, hyperinflammation, coagulopathy, immune dysfunction, metabolic imbalances and hypothermia."[134] Though MWDs experience significant levels of psychological, emotional, and physical trauma through their work in military theaters and from developing GDV—which likely far outweigh the amount of trauma a preemptive surgery induces—recognizing that any type of physically invasive operation induces trauma with short- and long-term effects is critical. For this reason, if humans choose to use dogs to perform tasks humans do not want to do, cannot do, or consider too dangerous for themselves,[135] humans should recognize their responsibility in diminishing the amount of potential pain, suffering, and trauma they force dogs (and other sentient beings) to endure. Therefore, if any type of surgery induces some level of pain, suffering, or trauma, humans have the responsibility to investigate alternative treatment that 1) prevents dogs from experiencing conditions preemptive surgeries prevent, and 2) diminishes dogs' experienced pain, suffering, and trauma during their work in the military, including preparation for service.

3 Analysis: Unexplored Reasons GDV Occurs in MWDs and Addressing Interconnected Symptoms of Trauma and Internalized Stress

Many scientists and animal advocates recognize the need to improve MWDs' quality of life, field performance, and military programs during their service. For this reason, in the past ten years, some scientists and advocates have invested in research to better understand "working dog genetics, rearing, training, and functional performance."[136] Yet, studies that explore root causes of GDV are rare.[137] Preventing GDV from occurring through prophylactic surgery, without understanding the underlying causes of GDV development, seems insufficient in improving MWDs' general well-being. Prophylactic surgery requires myriad dogs to undergo (sometimes invasive) surgery, but it does not protect dogs from the potential psychological pain and suffering that causes GDV, if the argument that GDV results from trauma and subsequent internalized stress and anxiety is correct. This point is illustrated by MWDs' development of mesenteric volvulus after receiving prophylactic surgery, and on a grander scale, by considering the rates of mental illnesses MWDs develop while serving militaries. The following section will return to this article's hypothesis—that GDV is actually a physical manifestation of MWDs' experienced trauma and internalized stress. It will describe and connect symptoms of unmanaged trauma and

[133] Miller et al., *supra* note 11, at e472.
[134] Geoffrey P. Dobson, *Trauma of major surgery: A global problem that is not going away*, 81 INT'L J. SURGERY 47, 49 (2020).
[135] The argument to this reasoning is whether humans should feel morally exculpated for forcing dogs and other animals to perform jobs when humans will not perform the jobs themselves for fear of *their* loss of life and limb.
[136] Cobb et al., *supra* note 51, at 1.
[137] Levine & Moore, *supra* note 97, at 2.

the subsequent development of mental illnesses, physical behaviors, and physical symptoms MWDs frequently experience, that may lead to internal injuries like GDV.

Trauma. Trauma is an emotional reaction to dangerous or stressful events, which can result in short- and long-term mental and physical symptoms.[138] MWDs' lives and responsibilities are objectively traumatic. Though reactions to trauma may be temporary and easily manageable for some beings, other beings may have "prolonged reactions" and "acute symptoms" that have long-term effects on them.[139] Mental and physical symptoms of trauma may include exhaustion, but also insomnia; confusion; sadness; agitation or edginess, including being easily startled and extreme alertness; numbness; dissociation; physical arousal, including an increased heart rate; headaches and muscle pain; changes in eating patterns; blunted affect; and PTSD, Acute Stress Disorder, and other mood or anxiety disorders.[140] Not all these symptoms must exist for a sentient being to suffer from trauma. As mentioned in previous sections, MWDs show clear signs of suffering from trauma: They exhibit many of these symptoms, including PTSD, which US militaries' animal handlers and behaviorists openly acknowledge.[141] Suffering from trauma, including the intense levels MWDs experience daily, induces high levels of internalized stress, by way of increased cortisol (the "stress" hormone) throughout their bodies.[142]

Stress. Internalized stress—or high cortisol levels—is the body's response to emotional and psychological pressure.[143] Stress can physically manifest in the body as general aches and pains; chest pain or feeling one's heart race; exhaustion and trouble sleeping; headaches, dizziness; shaking; high blood pressure; muscle tension and jaw clenching; a weak immune system; and, significant to this discussion, stomach or digestive problems.[144] In application, humans and dogs alike experience stress when they encounter traumatic events; seemingly neutral events may induce trauma; or they may exist in environments that provide continuous external stress, which can create trauma in the body, and then induce internalized stress. In other words, trauma can induce internalized stress, and external stress can induce trauma, which induces more internalized stress. Responses to trauma and stress often lead to mental illnesses and deleterious physical conditions.[145] For MWDs, these scenarios may occur incessantly during their military tenure. Additionally, animals' reactions to externally stressful conditions can induce their exhibition of stereotypic behaviors, which induce more internalized stress and trauma, and lead to further physical injuries.[146] The cycle may look like this:

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[138] *What Is Trauma? Stress vs. Trauma*, NAT'L NETWORK FOR YOUTH (last visited Mar. 23, 2023), https://nn4youth.org/learn/trauma-informed-care-toolkit/stress-vs-trauma/.

[139] SUBSTANCE ABUSE & MENTAL HEALTH SERVS. ADMIN., TIP 57: TRAUMA-INFORMED CARE IN BEHAVIORAL HEALTH SERVICES 7 (2014) [Hereinafter SAMHSA].

[140] *Id.* at 61; *Symptoms, Signs & Effects of Psychological Trauma*, CASCADE BEHAV. HEALTH (last visited Sept. 1, 2022), https://www.cascadebh.com/behavioral/trauma/signs-symptoms-effects/.

[141] Ohlms, *supra* note 7.

[142] *How Does Your Body Remember Trauma?*, PSYCHCENTRAL (Sept. 13, 2022), https://psychcentral.com/health/how-your-body-remembers-trauma.

[143] NAT'L NETWORK FOR YOUTH, *supra* note 139.

[144] *Stress*, Cleveland Clinic (last reviewed Jan. 28, 2021), https://my.clevelandclinic.org/health/articles/11874-stress.

[145] *Trauma and Violence*, SUBSTANCE ABUSE & MENTAL HEALTH SERVS. ADMIN. (updated Sept. 27, 2022), https://www.samhsa.gov/trauma-violence; *Stress*, CAMH (last visited Mar. 23, 2023), https://www.camh.ca/en/health-info/mental-illness-and-addiction-index/stress#:~:text=When%20stress%20becomes%20overwhelming%20and,complaints%20such%20as%20muscle%20tension.

[146] *Supra* Section II(a).

Externally stressful or dangerous event(s) and/or living conditions →

trauma ←→ internalized stress →

PTSD, anxiety, and other deleterious mental conditions →

(perhaps, stereotypic behaviors) →

deleterious physical conditions →

(hypothesis: GDV development).

This chain or cycle of events may connect to GDV in multiple ways: 1) The trauma MWDs experience from externally stressful events during their military tenure induces internalized stress, which then induces mental illnesses, including anxiety, which, when untreated, physically manifests in the body as GDV. (The trauma and stress in this hypothesis could come in different and repeating orders). And/or 2) the external stress and trauma MWDs experience during their military tenure induce stereotypic behaviors, which also happen to cause GDV, as seen in the earlier example in which researchers proposed that anxiety causes dogs to gulp excessive amounts of air, which then distorts the stomach and contributes to GDV. In either of these scenarios, the cycle begins with external stress and trauma, continues with internalized stress and deleterious mental states, and leads to dogs developing physical injuries.

Common ailments of MWDs. MWDs frequently exhibit the following mental states, physical symptoms, and behaviors during their military service: Stress; aches and pains; PTSD, which amounts to becoming fearful of loud noises, increased aggression, forgetfulness, and a lack of desire to work; anxiety; extreme alertness and agitation/edginess; and stomach and digestive problems (including GDV).[147] These symptoms clearly, if not explicitly, overlap with symptoms of trauma and internalized stress. Therefore, externally stressful or dangerous environments and living conditions have a plausible and strong connection to deleterious physical injuries, such as GDV. To support these arguments, studies have shown, and observations have been made, that "[c]rowded and stressful conditions have been associated with feed animals and chickens becoming ill."[148] This fact shows that animals *do* develop internal, physical illnesses from stressful environments, which are traumatic. Therefore, applying this argument to MWDs who experience high levels of trauma, internalized stress, and anxiety through all their military environments, and subsequently develop mental illnesses (i.e., PTSD) and physical conditions like GDV seems like a realistic hypothesis. For this reason, research is necessary to investigate whether a connection between trauma, stress, and the development of GDV in MWDs

[147] Ohlms, *supra* note 7.

[148] MICHELLE R. LLOYD-PAIGE, THINKING AND EATING AT THE SAME TIME: REFLECTIONS OF A SISTAH VEGAN, *in* SISTAH VEGAN: BLACK WOMEN SPEAK ON FOOD, IDENTITY, HEALTH AND SOCIETY 4 (A. Breeze Harper ed., 2d ed. 2020); *see, e.g.*, Robert Dantzer & Pierre Mormède, *Stress in Farm Animals: A Need for Reevaluation*, 57 J. ANIMAL SCI. 6-18 (1983); J.A. Hill, *Indicators of Stress in Poultry*, 39 WORLD'S POULTRY SCI. J. 24-31 (1983); K.S. Schwartzkopf-Genswein et al., *Road transport of cattle, swine and poultry in North American and its impact on animal welfare, carcass and meat quality: A review*, 92 MEAT SCI. 227-243 (2012) (each study interrogating environments and factors that induce stress in farmed animals).

exists. Such research would likely provide new insights into MWDs' welfare and their development of injurious mental and physical conditions.

4 A Proposed Solution: Identifying the Root Causes of GDV and Attempting to Improve MWDS' Welfare

Individual countries are beginning to legally recognize that dogs are sentient beings, as seen through progressive legislation and politics in the European Union, Australia, New Zealand, Canada, the US, and the United Kingdom. Countries can maintain this momentum by requiring changes in militaries' treatment toward MWDs that reflect the changing attitudes of the citizens they represent. Since the MWD industry will likely exist for the foreseeable future, such changes would require militaries to prioritize MWDs' welfare concerns. Therefore, innovative studies in this area could serve two purposes: 1) to understand the reasons MWDs develop GDV and prevent it from occurring, and 2) to identify key factors that improve the mental, psychological, and physical well-being of MWDs. Militaries could apply these studies' findings to new processes and treatments for MWDs, to potentially prevent the need for MWDs to undergo prophylactic surgery, which can lead to physical complications, physical trauma, and psychological trauma. The results of this research could also improve militaries' perspectives toward MWDs and improve MWDs' welfare during their service. This article provides specific examples for proposed research in the following paragraphs.

4.1 New Studies

Research conceptions—GDV.[149] At the time of this article's writing, research that focuses on new approaches to specifically manage MWDs' welfare, particularly as it relates to GDV development, is not prolific beyond studies that only try to identify potential causes of GDV. In turn, this article attempts to initiate discussion regarding stable alternatives to promote MWDs' welfare as it applies to GDV and to decrease the need for prophylactic surgeries for MWDs. Since this article's author is not a veterinary professional, the author proposes suggestions for research—though they may be frustratingly vague and insufficient—with the hope that veterinarians and scientists can use the suggestions to conduct innovative research that will improve MWDs' lives. This being said, the following section lists some suggestions for new research conceptions that may decrease the need for MWDs to undergo prophylactic gastropexy.[150]

Militaries could work with animal scientists and behaviorists to develop safe research environments at military dog training sites (such as the Lackland Airforce Base), to understand the root causes of GDV and to develop new practices that improve MWDs' military experiences. These studies could test variables on 1) dogs who have already received prophylactic gastropexy, and then eventually 2) dogs who have not received prophylactic gastropexy, after concrete evidence shows that decreasing

[149] The proposed research strategies in this section are either the author's own or based on the limited research on this topic or related topics, which have been cited within the article.

[150] Citations in the following paragraphs mostly refer to studies that evaluate welfare practices on captive dogs, working dogs, and service animals since these classes of dogs can experience similar environments and welfare practices as MWDS.

external stress in MWDs' environments,[151] and decreasing trauma and internalized stress in MWDs, prevents GDV's occurrence. Tests could include measuring the presence of cortisol levels, serotonin levels, and oxytocin levels in dogs[152] when they have exposure to important welfare variables, including nutrition, environment, physical health, behavioral interactions, and sleep.[153] For instance, researchers conducting these studies could measure MWDs' cortisol, serotonin, and oxytocin levels when militaries incorporate variables that either show some evidence of decreasing GDV, or improve MWDs' welfare that might lead to lower GDV occurrences. Example variables include: Allowing MWDs to sleep and rest for longer periods of time than they currently experience in the field; allowing MWDs to play with other dogs and have communal interactions; providing areas that allow MWDs to rest together (touch each other), rather than being isolated in kennels; allowing MWDs to lightly exercise after eating; giving MWDs fish and egg supplements; allowing MWDs to evenly divide their time between indoor and outdoor environments when they are off duty; and teaching MWDs methods to turn on and turn off aggressive behaviors so they can maintain substantial periods of time in a calm state.[154] Success or failure in integrating these variables in MWDs' lives will inspire ideas for new variables to introduce into MWDs' lived experiences, which researchers can measure.[155] This investigation into new, prospective living conditions will eventually provide dispositive data regarding which variables really do make MWDs feel comfortable, lower their cortisol levels and so, decrease their trauma, stress, and anxiety; and

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[151] *See, e.g.*, *generally* A. BODNARIU, A REVIEW OF HOUSING SYSTEMS FOR KENNELLED DOGS AND THEIR IMPLICATIONS FOR DOG WELFARE, *in* SUSTAINABLE ANIMAL HUSBANDRY: PREVENTION IS BETTER THAN CURE, VOLUME 1. PROCEEDINGS OF THE 14TH INTERNATIONAL SOCIETY FOR ANIMAL HYGIENE 353-56 (A. Briese et al. eds. 2009) (studying external environments' impact on the welfare of kenneled dogs) *and* J.A. SERPELL ET AL., 23 – WELFARE CONSIDERATIONS IN THERAPY AND ASSISTANCE ANIMALS, *in* HANDBOOK ON ANIMAL-ASSISTED THERAPY 481-503 (3d ed. 2010).

[152] *See* Gwang-Hoon Lee et al., *Assessment of Stress Caused by Environmental Changes for Improving the Welfare of Laboratory Beagle Dogs*, 13 ANIMALS 1-13 (2023) (discussing additional measurement options, including body weight, cortisol levels, alkaline phosphatase activity serum, steps per hour, and clinical sign observations).

[153] Cobb et al., *supra* note 51, at 1-9; Pierre Mormède, *Exploration of the hypothalamic—pituitary—adrenal function as a tool to evaluate animal welfare*, 92 PYSCHOL. & BEHAV. 317-39 (2007); BODNARIU, *supra* note 153, at 353-56 (discussing the study's use of measuring cortisol levels in dogs after exposure to certain variables within their environments to determine whether those variables decrease or increase stress and impact welfare); Admin, *Essay: Decreasing undesired aggression in military working dogs and improving their welfare*, VETERINARIAN (June 20, 2011), https://theveterinarian.com.au/?p=547 (citing several studies to argue that MWDs' required increased aggression for their roles and their forced living in isolated kennels increases cortisol levels and decreases their welfare).

[154] CANADIAN KENNEL CLUB, *supra* note 87; Cobb et al., *supra* note 51, at 1; VETERINARIAN, *supra* note 155; Nicola Rooney et al., *A Practitioner's guide to working dog welfare*, 4 J. VETERINARY BEHAV. 127, 127 (2009) (explaining that the study showed working dogs exhibit high levels of stress because of isolated kenneling practices, which influences working dogs' poor performance during training and work); Rebecca Sommerville et al., *Why do dogs play? Function and welfare implications of play in the domestic dog*, 197 APPLIED ANIMAL BEHAV. SCI. 1, 1 (2017) (explaining that dogs play for different reasons and within different contexts, but that play—though not necessarily a positive welfare indicator—can improve motor skills, social cohesion, and training for unexpected events. These improved functions would support MWDs' improved performance.).

[155] MWD handlers may be vital in offering new ideas and variables given their intimate relationships with their MWDs. *See generally* Ioannis Chaniotakis et al., *Improving Military Dogs' Welfare: Is there a Place for Handlers' Beliefs and Perceptions*, 26 SOC'Y & ANIMALS 388-401 (2018) (explaining that MWD handlers can provide insight to MWDs' welfare needs, which can provide insight to improving welfare standards for MWDs).

increase their serotonin and oxytocin levels that enable relaxation and potentially decrease GDV occurrences.[156]

During these studies, in no way should militaries subject participating dogs to new environments and variables that provide a potential risk of making them develop GDV, if they have not received prophylactic gastropexy. Participating dogs' health and welfare is the top priority in every point of this discussion; the process to finding solutions should benefit the study's participating MWDs, not just future MWDs. Therefore, this proposed study's researchers and handlers must take all precautions to prevent MWDs from developing GDV while existing within these test environments.[157] This assured prevention would occur by working with MWDs who have already received prophylactic gastropexy. This practice would not decrease participating MWDs' welfare or lived experiences more than would occur if the dogs did not participate, since prophylactic gastropexy is mandatory, at least if the study occurred in the US. Once introduced variables show clear evidence that they do decrease MWDs' trauma and internalized stress—which may occur after years and multiple generations of dogs participating in the program—only then would the study start working with MWDs who have not received prophylactic gastropexy. Until that time occurs, one way researchers can prove whether certain variables decrease trauma and stress, improve MWDs' welfare, and effectively prevent GDV from occurring, is by recording whether participating dogs continue to develop mesenteric volvulus, because this condition frequently develops in dogs who receive gastropexy.

Another way to measure variables without risking participating dogs' health, would be for the study's researchers to compare study data to US MWDs' environments and data from GDV occurrences prior to 2010, when prophylactic surgery was not mandatory. Though this historical data will not include MWDs' measured levels of cortisol to determine existent levels of trauma and internalized stress, or serotonin and oxytocin levels to determine existent levels of relaxation and contentment, the data will provide the rate at which these dogs experienced GDV or mesenteric volvulus. Researchers could then set a working hypothesis that MWDs who experienced GDV had high cortisol levels and low oxytocin and serotonin levels. Researchers could confirm this hypothesis by measuring cortisol levels in dogs in general populations who receive emergency gastropexy and, perhaps, MWDs who experience mesenteric volvulus. They could then compare this data to the study's participating dogs' actual cortisol, oxytocin, and serotonin levels in tested environments and on tested variables to measure any hormonal changes. Comparing the experiences and welfare of MWDs in military theaters before the study's execution, to GDV and/or mesenteric volvulus rates and experiences of current MWDs and the study's MWDs, could provide insight on whether a life with improved welfare variables decreases MWDs' rates of GDV and GDV-related conditions, and ultimately, improving MWDs' performance and survival during their service.[158] Additional variables the study will need to consider include, but are not limited to, participating

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[156] *See generally* Lee et al., *supra* note 154, at 1 (discussing a study that similarly focused on evaluating stress levels of dogs held in captive environments and determining whether introducing environmental and social enrichment improved the dogs' well-being).

[157] J.A. SERPELL ET AL., *supra* note 153, at 481 (describing a study that evaluated assistance animals in their raising and training environments to determine whether those environments caused or exacerbated assistance animals' degradation).

[158] *See, e.g.*, *generally* Mia Cobb et al., *The advent of canine performance science: Offering a sustainable future for working dogs*, 110 BEHAV. PROCESSES 96-104 (2015) (describing established, evidence-based, "canine performance science" that improves working dog welfare while simultaneously improving working dogs' performance, to support this article's research proposal and to affirm the need for research in this area).

dogs' ages, breeds, origins of purchase, and roles within the military (i.e., does a dog's training focus on rescue missions, raids, bomb detections, etc.). The study's researchers would also need to collect information on these variables from pre-2010 data.

Research conceptions—general welfare. In addition to studies that specifically investigate root causes of GDV, militaries could work with scientists and animal behaviorists to further research methods to improve MWDs' welfare, to decrease their experienced trauma, internalized stress, and resulting mental illnesses. This research would build onto welfare research Cobb et al. and many others have commenced.[159] This type of research could facilitate environments that holistically promote MWDs' emotional, psychological, and physical well-being, which could include increased attention to dogs' coping styles; personalities; behavioral cues; rest and sleep; social (healthy interactions and socialization with other dogs), environmental, and mental enrichment; and promoting individual agency.[160]

Studies on service animals could support GDV and welfare research and shed light on effective and conscientious research options since such studies have shown that service animals experience similar forms of diminished welfare standards in their work serving humans with special needs (i.e., therapy dogs, and dogs who support individuals with autism or who are visually impaired).[161] In studies that evaluated strategies to improve service animals' lived experiences, studies observed oxytocin and cortisol levels in service dogs during training and during their interactions with humans.[162] Importantly, such studies considered individual dogs' temperaments, which may influence each dog's ability to cope with different environments and stress levels.[163] By evaluating hormonal (cortisol, serotonin, and oxytocin) levels and recognizing that all dogs' personalities and responses to lived experiences are unique, these types of studies can provide a range of welfare variables that will ensure dogs in stressful environments have appropriate resources to manage and recover from external stress and trauma. Recognizing each dog's unique temperament can provide MWD handlers with a variety of resources and handling tricks to respond to their MWD's specific agitation instigators and deleterious (stereotypic) behaviors, to help them remain calm and better cope with stressful environments.

Any research or studies will need to use evidence-based practices and be transparent about measured factors, whether those factors focus on changing hormone levels or animal welfare variables that promote MWDs' stable psychological, emotional, and mental health.[164] This approach would be a necessary shift away from traditional animal welfare science, which anthropocentrically focuses on animals' improved performance and productivity without actually focusing on animals' basic needs and requirements to thrive.[165] Militaries may not be able to decrease the amount of external stress MWDs experience during their service, since their role in militaries is to perform dangerous and life-threatening tasks. However, the information in

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[159] Cobb et al., *supra* note 51, at 1-9.
[160] *Id.* at 7-8.
[161] *Id.* at 3.
[162] Sharmaine L. Miller et al., *The Importance of Evaluating Positive Welfare Characteristics and Temperament in Working Therapy Dogs*, 9 FRONTIERS VETERINARY SCI. 1, 1 (2022); Emmy A.E. van Houtert et al., *Do Service Dogs for Veterans with PTSD Mount a Cortisol Response in Response to Training?*, 11 ANIMALS 650, 650 (2021).
[163] Miller et al., *supra* note 164, at 650.
[164] Cobb et al., *supra* note 160, at 96 (explaining science that focuses on working dog performance should be transparent, objective and traceable, and align with community/evolving societal expectations).
[165] Cobb et al., *supra* note 51. at 8.

studies like these will hopefully lead to militaries facilitating environments for MWDs that allow them to recover from their experienced trauma and so, decrease their internalized stress and anxiety levels. In turn, MWDs could serve without undergoing surgery or developing injurious physical conditions, and still live healthy and satisfying lives.

4.2 Implementing Strategies to Improve MWDs' Welfare, Generally

Animal welfare scientists have already conducted studies that identify certain variables, which influence MWDs' welfare. Until militaries invest in studies like those previously mentioned, militaries can use data from these existing studies to implement practices that improve MWDs' well-being.

Sleep. One important variable that improves MWDs' lived experiences is complete rest and sleep, which promotes sentient beings' ability to maintain healthy and stable emotional states.[166] Maintaining healthy emotional states allows sentient beings to recover from trauma, internalized stress, and anxiety.[167] Therefore, if MWDs receive adequate amounts of sleep and rest, they may be able to psychologically and physically recover from their experiences in combat and in the field.

Proper sleep and rest does not mean holding MWDs in cramped kennels and commanding their stillness until the next time militaries need them. Such an environment may actually contribute to sleep deprivation because MWDs are isolated from one another—they do not have the ability to receive comfort from other dogs, which induces internalized stress.[168] They are kept in environments in which they are on call without any assurance they can sleep free of interruption. Furthermore, dogs are kept in barracks or kennels surrounded by human soldiers,[169] the commotion of which may also disrupt sleep. Interestingly, symptoms of sleep deprivation in dogs are similar to expressed PTSD symptoms: MWDs become easily triggered and react to stressful stimuli, they can become irritable, and they experience decreased memory capabilities.[170] Sleep deprivation also increases cortisol levels, which in turn, increases stress and anxiety.

Proper rest and sleep, instead, require a consistent sleeping schedule, sleeping on a comfortable bed in a quiet and dark space, and consistent periods of rest throughout the day.[171] Implementing an appropriate sleeping infrastructure for MWDs could be an easy strategy to greatly improve the general welfare of MWDs. In turn, if this article's argument is correct—that GDV occurs because it is one method the body uses to manage internalized stress and anxiety—adequate rest may be one important variable that protects MWDs from developing GDV. Adequate amounts of sleep also promote sentient beings' ability to learn, improve immune function, improve performance, and recover from work, all of which would improve their military benefit to humans.[172]

Other considerations. Some animal welfare scientists and experts have found that certain behavior and nutrition patterns decrease dogs' experienced rates of GDV.

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[166] *Id.* at 7.
[167] *Id.*
[168] Rooney et al., *supra* note 155, at 127 (explaining that isolated kennel environments increase stress in dogs).
[169] Calloway, *supra* note 59.
[170] Tom Ryan, *How Many Hours A Day Do Dogs Sleep?*, SLEEP FOUND. (June 10, 2022), https://www.sleepfoundation.org/animals-and-sleep/how-much-do-dogs-sleep.
[171] *Id.*
[172] Cobb et al., *supra* note 51, at 7.

These variables include dogs at risk for GDV playing with other dogs (AWF[173]—behavioral interaction), receiving fish and egg dietary supplements (AWF—nutrition), spending an equal amount of time inside and outside (AWF—environment), and participating in light activity after eating (AWF—physical health).[174] One study also showed that certain personality factors decreased rates of GDV.[175] These factors include a "'happy' and easy going temperament, submission to other dogs or people, high activity levels" and general interactions or being in close proximity to other dogs.[176] Essentially, dogs with calmer temperaments experience a decreased risk of GDV.[177] As mentioned in this article's proposed study section, if certain animal welfare variables and temperamental factors affect dogs' rates of GDV, then perhaps militaries can change MWDs' housing conditions and work with animal behaviorists to implement these strategies. For instance, animal behaviorists could teach MWDs to 'switch on' the alertness and aggression militaries expect of them—as their role requires—when they have to work, but then behaviorists could also teach MWDs to 'turn off' aggressive behavior so that they can spend their inactive duty periods resting, recovering, and existing with a calm psyche.

Researchers have observed that dogs who receive adequate intellectual stimulation and socialization during their first year of living tend to be more well-adjusted, which allows them to stay calm and maintain an easy going temperament.[178] If this observation is correct, militaries could work with MWD breeders and handlers at MWD training sites to ensure MWD puppies experience adequate socialization with other dogs, and to develop innovative ways to improve MWDs' welfare.[179] This method would allow MWDs to learn they can be calm and sociable when they are in a relaxed environment (i.e., when dogs are free to roam), but they would also know to be attentive and alert when they are with their handlers, as is needed during their missions. If animal scientists and behaviorists agree that MWDs suffer from trauma, militaries should try to make MWDs' tenure more humane so they can survive the responsibilities militaries expect of them.

4.3 Incentives for Militaries to Invest in Studies and Practices that Decrease GDV and the Need for Prophylactic Surgery, and to Improve MWDs' Welfare

Since militaries throughout the world use MWDs who provide critical services during war; international governing bodies have not recognized a legal status for MWDs, but do recognize norms in considering MWDs' welfare during their service; MWDs experience disproportionately high rates of GDV compared to non-MWDs; and many MWDs do not reach retirement age because of physical injuries that seem strongly related to GDV, developing strategies to decrease the need for MWDs' prophylactic surgeries, as well as investigating ways to improve MWDs' welfare during service would behoove all nations' militaries. Furthermore, since dogs do not have the ability to be heard in the same way that humans who work in militaries do, militaries need to proactively work with animal scientists, behaviorists, MWDs' handlers, and other

[173] 'Animal welfare factor.'
[174] CANADIAN KENNEL CLUB, *supra* note 87; Cobb et al., *supra* note 51, at 1.
[175] CANADIAN KENNEL CLUB, *supra* note 87.
[176] *Id.*
[177] *Id.*
[178] *Id.*
[179] Chaniotakis et al., *supra* note 157, at 388.

necessary specialists to identify the best way to preserve MWDs' well-being while also accomplishing their military goals. In the past, militaries have not had any need to change their behavior towards MWDs because the status quo worked well enough, even if it seriously injured MWDs in the process. Additionally, the financial investment for MWDs is significant. Therefore, studies that focus on MWDs' welfare could allow militaries to save money and resources, particularly for countries that have limited financial means or limited access to dogs, compared to larger countries like the US or China. Countries might become incentivized to prioritize MWDs' well-being because it benefits them, and also happens to benefit MWDs. Indeed, perhaps militaries would be willing to invest in research that benefits MWDs if the research results provide insights into ways militaries could save financial resources by no longer having to pay for prophylactic surgeries, prolonging MWDs' length of service, and purchasing and training fewer replacement MWDs. Of course, these propositions and research are not meant to increase the amount of time MWDs have to serve militaries. In fact, one could hope that militaries would change their cultural perspectives towards dogs and realize that dogs should not be in military theaters at all. But, until that shift occurs, perhaps these proposed studies and welfare modifications could at least improve the lives of MWDs while they serve, by facilitating environments that induce less trauma and internalized stress, and prevent MWDs' development of mental illnesses and deleterious physical conditions.

5 Conclusion

(Most) militaries respect MWDs, but still use them as tools and expendable resources. Militaries, and society generally, should interact with and support MWDs (and all animals) as the sentient beings they are. Militaries must recognize that MWDs are colleagues who improve the lives of humans and so, require greater protections than those they currently receive. Improved protections must illustrate society's recognition that it owes MWDs respect and ethical considerations because they ease human life.[180] Therefore, militaries should not treat symptoms of physical, psychological, and emotional trauma and internalized stress with solutions that prevent the symptoms, but that do not resolve the symptoms' root causes. Rather, militaries should address these causes by facilitating environments that promote MWDs' well-being and so, resolve those causes and subsequent symptoms. This approach could increase MWDs' quality of life and increase their longevity. If this work does shed light on ways to improve MWDs' welfare and lived experiences, it may also influence the treatment and improve the welfare of dogs whom humans contract to militaries and use in other stressful and trauma-inducing environments. Through interest, purposeful investment in studies and welfare applications, and a desire to improve MWDs' lives, militaries have the power to improve MWDs' living conditions. Until the day comes that countries deem MWDs unnecessary to their missions, innovative studies could bring humans one step closer to making the lives of MWDs throughout the world a little more comfortable.

Acknowledgments: I would like to thank Alexander Noronha for his generous, detailed, and thoughtful contributions regarding MWDs who are used in Brazil's military branches.

[180] Cobb et al., *supra* note 51, at 3.

The Bio-Zoopolitics of U.S. Military Working Dog Policy in the U.S. "War on Terror"

Chloe Diamond-Lenow

Abstract: This paper analyzes the differential positioning of military working dogs in U.S. military policy with particular attention to the period from 2000-2023, during which, among other shifts, these dogs were reclassified within U.S. law and military code from "expendable equipment" to "military animals." This time also aligns with the time of the U.S. "war on terror."[1] The paper draws on feminist and postcolonial animal studies to consider the larger cultural contexts under which these shifts emerged, particularly within the biopolitical and racialized contexts of this war. Considering the cultural contexts of these legislative shifts helps illuminate the biopolitical and zoopolitical entanglements of animality, nationalism, and war in determining how military working dogs gain a certain limited "right to life" through U.S. military policy within the racialized sacrificial economies of this war.

Keywords: Military working dogs; US military; biopolitics; zoopolitics; "war on terror"; robot dogs.

1 Introduction

This paper analyzes the differential positioning of military working dogs in U.S. military policy with particular attention to the period from 2000-2023, and within the cultural contexts of the U.S. "war on terror." During this time, among other shifts, these dogs were reclassified within U.S. law and military code from "expendable equipment" to "military animals." These shifts occurred within the larger biopolitical and racialized contexts of the U.S. "war on terror."

2 Histories of Dogs in the U.S. Military: Dogs as "Expendable Equipment"

The U.S. military has the largest military working dog program in the world. In 2016, there were an estimated 1,800 military working dogs deployed within the U.S. military, although this number may be much higher since the military also uses many contract working dogs through private contractors, who are not included in this overall count.[2] U.S. military working dogs are usually Belgian Malinois and German and Dutch

[1] I use "war on terror" to refer to U.S. military action in the Middle East from 2001-2021, including in Iraq, Afghanistan, and Syria, accompanied by ideologies of Islamophobia and orientalism underpinning broader U.S. security practices and rhetorics staged against those framed as "terrorist others."

[2] "Department of Defense: Medical Conditions and Care for End-of Service Military Working Dogs" United States Government Accountability Office, Report to the Committee on Armed Services, House of Representatives (March 2017), Available at: https://www.gao.gov/assets/gao-17-358.pdf.

Shepherds. The dogs are used to detect IEDs, to patrol, to attack "enemy others," and to work in search and rescue efforts.

The U.S. military has a long history of using dogs in war, but only recently have these dogs gained a certain "right to life" in U.S. military policy. In World Wars I and II, dogs were used as messengers, in search and rescue missions, to guard bases, and as "military mascots." In World War II, the U.S. Army asked families to donate their dogs to support the war effort, with a promise that it would return these dogs when the war was over.[3] The Army established the first military working dog program in 1942, called the "K-9 Corps." These dogs were given value in relation to their status as domestic pets. The dogs, thus, gain value in relation to their proximate intimacy with, and value for, humans.

Since World War II, the dogs have been classified as "expendable equipment," like a gun, vest, or other tool used by the military. This classification meant that when dogs located in the United States were considered no longer useful to the U.S. military, they were sent to work as K9 dogs for police units, used in training programs for new handlers, or euthanized. When dogs located overseas were deemed no longer useful, the military abandoned or killed them.[4] The U.S. military used an estimated 4,000-4,900 dogs in the Vietnam War, and only brought 200 back to the United States.[5] The remaining dogs were either killed or left in Vietnam.[6] This wanton treatment of dogs reveals the ways in which they are always already positioned as disposable under the logics of war and human exceptionalism.

From the beginning, the U.S. and other nations have instrumentalized dogs as tools and weapons of war. They are granted little to no regard within U.S. military law and policy. Though often individual soldiers form close bonds with the dogs, they have been understood since the beginning of the war dogs program as disposable weapons of war, like guns and ammunition. The dogs are extremely useful for the U.S. military: they help to protect and sustain American life, while their own lives are treated as expendable.

3 From Expendable to Adoptable: Robby's Law (2000)

Many, including animal rights organizations, veterans who were former dog handlers, politicians, and the general public, criticized the military's longstanding policy of killing and/or leaving behind military working dogs in foreign countries. They argued that rather than being abandoned or killed, older dogs should be released from service to the military and made available for adoption by former handlers and other U.S. citizens. They claimed that the dogs contributed valuable labor to the nation, and in consequence, deserved the chance for a good life and should "not have to work until their dying day."[7]

Critics particularly mobilized their efforts around the long career, loyalty, and eventual suffering of one dog in particular: Robby, an 11-year-old Belgian Malinois bomb-sniffing dog. Numerous news media and popular reports emphasized that

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[3] Janet M. Alger and Steven F. Alger, "Canine Soldiers, Mascots and Stray Dogs in U.S. Wars" in Ryan Hediger (ed), *Animals and War: Studies of Europe and North America* (Brill, 2013, p. 81).
[4] Ryan Hediger, "Dogs of War: The Biopolitics of Loving and Leaving the U.S. Canine Forces in Vietnam," *Animal Studies Journal* (2013) 2(1), 55-73.
[5] Rebecca Frankel, *War Dogs: Tales of Canine Heroism, History, and Love* (London: Palgrave Macmillan, 2014, 236).
[6] Ryan Hediger, "Dogs of War: The Biopolitics of Loving and Leaving the U.S. Canine Forces in Vietnam," *Animal Studies Journal* (2013) 2(1), 55-73.
[7] Lisa Hoffman, "Semper Fido." *Scripps Howard News Service*, 12 Sept. 2000, Accessed 2 Jun 2013.

Robby suffered from various health problems after his long work for the military, and that he had to continue to work until his "dying day." These reports particularly emphasized his ill-health, describing him, as for example, a "toothless, lame Marine Corps explosives-sniffing dog…aching with arthritis and a bum hip, a pronounced limp…and weak front shoulders."[8]

Representations of Robby figured centrally in discourses seeking to garner public support to overturn the military's policy that rendered dogs as expendable and as having to work even after they were no longer of use to the US military. One source claimed that Robby was the "dog who triggered the concern on Capitol Hill and across the country."[9] People for the Ethical Treatment of Animals (PETA) initiated a "Save Robby" campaign to mobilize dog-lovers across the country to protest Robby's "plight" and work for legislation to protect and respect other military working dogs. The campaign emphasized that he deserved to retire from service work and live out the rest of his life as a pet. PETA wrote a letter to the chief of veterinary services at the U.S. military's dog training facility as part of this campaign. They wrote: "We hope you will agree that forcing Robby to work despite his deteriorating health until the day he dies, without being able to experience the comfort and joys of normal companionship, would be tragic…We respectfully ask that you do what is in the best interest for Robby by retiring him from duty altogether and granting him a well-deserved reward for his lifelong service to the U.S. military."[10] Despite the public mobilization around Robby, he was euthanized in January 2000.

In 2000, H.R. 5314—popularly referred to as "Robby's Law"—was passed, allowing military working dogs, after their usefulness to the military has ended, to be adopted by their former handlers, law enforcement agencies, or other civilians.[11] The law originally required the military to keep official count of how many dogs it allows to be adopted and euthanizes per year (although a provision in the 2012 defense authorization repealed this reporting requirement).[12]

While Robby's Law allowed military working dogs to be adopted after they were released from duty, the dogs were still classified as "excess" and treated as equipment. This made it difficult to transfer the dogs to potential adopters and it also meant that the Department of Defense would not cover any of these transportation expenses, nor would it pay for the dog's veterinary care. According to military policy, "Once that dog is adopted, it becomes a pet, and therefore loses its MWD [Military Working Dog] status, so it would be fraud, waste and abuse for the Department of Defense to transport that pet."[13] The military would not pay to transport these dogs to the United States so people who wanted to adopt the dogs would have to spend thousands of dollars to bring them back from overseas.[14] In addition, adopters had to

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[8] *Ibid.*

[9] Scripps Howard News Service, "Dog's Day - Congress Considers Allowing Aging Canines Working for Military to be Adopted" *The Dallas Morning News,* 16 Oct. 2000, 2A.

[10] Lisa Hoffman, "Semper Fido." *Scripps Howard News Service* (12 Sept. 2000) accessed 2 Jun 2013.

[11] Public Law 106-446; 10 U.S.C. Chapter 153 ("Robby's Law"), available at: https://strategicvets.com/wp-content/uploads/2017/09/Robbys-Law-Public-Law-106-446.pdf.

[12] Public Law 112–81, Dec. 31, 2011, "National Defense Authorization Act for Fiscal Year 2012, available at: https://www.govinfo.gov/content/pkg/PLAW-112publ81/pdf/PLAW-112publ81.pdf.

[13] Hurley, Andi. "Are Military Working Dogs Being Euthanized?" *Military.com* (12 Jan. 2012) www.military.com/spousebuzz/blog/2012/01/are-military-working-dogs-being-euthanized.html accessed 11 October 2018.

[14] "Canine Members of the Armed Forces Act," Animal Welfare Institute, available at: awionline.org/content/canine-members-armed-forces-act. Accessed 11 Oct. 2018.

pay veterinarian fees associated with any health problems that the dogs had incurred while deployed.[15]

Provisions to protect and provide for contract working dogs—dogs the military used through private contractors—are notably absent within Robby's Law. These dogs, then, may be left behind in combat zones, and the military does not have to use its funds or supplies to care for the dogs. Thus, while helpful for protecting some dogs used within U.S. military endeavors, Robby's Law does not guarantee fair and humane treatment for all dogs.

Robby's Law did not necessarily shift the structural underpinnings of the military's treatment of military working dogs. Although it made the dogs adoptable, it did not remove many of the financial and logistical barriers to adopting and caring for the dogs. No longer fully termed "expendable," the dogs were considered to be potentially "adoptable"—straddling the boundary between military weaponry and potential family members.[16]

Dogs rendered "adoptable" included dogs returned from service as well as other dogs the US military owned and trained at Lackland Airforce Base that had not passed the requisite training courses and could not, therefore, be certified as military working dogs. The Department of Defense categorizes some dogs as adoptable and others as "unfit" for adoption. Those dogs considered to be too dangerous and too much of a liability are euthanized. Former military handlers, families of dog handlers who died during war, and law enforcement agencies are given priority over civilians for adoptions of those dogs deemed suitable.

4 From "Military Equipment" to "Military Animal": The Canine Members of the Armed Forces Act and the U.S. (2012) and the 2013-2020 U.S. National Defense Authorization Acts

While Robby's law provided a pathway for dogs to retire and be adopted by their former handlers after their service, it did not shift the classification of these dogs as military "equipment," which would help with care and transportation for dogs post-service. Advocates wanted these dogs reclassified from equipment to "canine members of the armed forces."

In 2012, Senator Richard Blumenthal (D-CT) and Rep. Walter B. Jones, Jr. (R-NC) introduced "The Canine Members of the Armed Forces Act" as H.R. 4103 to the U.S. House and as S. 2134 to the U.S. Senate. Parts of the bill were adopted as amendments within The National Defense Authorization Act for FY2013.[17] The adopted amendment within the FY2013 National Defense Authorization Act authorized the military to transport dogs back to the United States for adoption, so long as the dog could not be adopted at the military facility where it was already located. It did not, however, require the military to transport the dogs, merely making this transportation an option. It also did not make the military financially responsible for this transportation or for veterinary care for the dogs. The amendment did allow for the Department of Defense to contract with a private non-profit to create a stream

[15] *Ibid.*

[16] Sid Christenson "He's a Jolly Good Canine—Working Dog at Lackland AFB will be First to Retire Under New Law" *San Antonio Express-News*, 21 March 2001, p. 1B.

[17] Public Law 112-239, Jan. 2, 2013, "National Defense Authorization Act for Fiscal Year 2013, available at https://www.congress.gov/112/plaws/publ239/PLAW-112publ239.pdf.

for private fundraising to help cover the costs of transportation and veterinary care for the adopted dogs.

Senator Blumenthal emphasized the importance of the reclassification of the dogs from object, or "equipment," to subject, or "canine member of the armed forces," because of the way this reclassification would allow the dogs to be treated more humanely after their deployment. Blumenthal wrote: "these dogs are so much more than a rifle or a tank. They are living breathing heroes who have saved the lives of our troops and provided many of our veterans with companionship long after they retire from service."[18] He justified his appeal for the subjectification of these dogs by framing them through their service to U.S. militarism—as brave heroes who serve U.S. military goals.

The adopted legislation within The National Defense Authorization Act for FY2013 ultimately did not include two other proposals that were part of the Canine Members of the Armed Forces Act, including, 1) re-classifying the dogs from "equipment" and 2) providing for commemoration and dedication to those dogs who died during service or who performed "heroic" feats while on duty. Ron Aiello, President of the United States War Dog Association, claimed that this was because the Senate decided that "to get the bill passed they had to take out a portion of it. That portion was the reclassification of the Military Working Dogs from Equipment to Canine Members of the Armed Forces."[19] That this reclassification would be difficult is interesting—it indicates that the dogs continued to be positioned as expendable equipment under the sacrificial economies of human exceptionalism and war.

In 2016, the military reclassified military working dogs from "military equipment" to "military animal" under Title 10 of the U.S. Code.[20] The reclassification codified in law that the dogs are not merely "objects," but instead, sentient animals. The bill also stipulated that former handlers of the military working dog would be given priority over civilians for adopting the dogs. While the reclassification of these working dogs from "equipment" to "animal" was an important rhetorical shift through which the dogs were referred, the reclassification did not entirely shift the military's overall treatment of the dogs. The importance of the dogs being seen as "animal" and not merely "equipment" was to guarantee better treatment for the dogs and an understanding and recognition that the dogs, as living sentient beings, should be afforded care and protection—that their lives *matter,* and the military is responsible for the welfare of these animals.

In a move that did address some of the broader issues around the treatment of military working dogs, the 2019 National Defense Authorization Act required the Department of Defense to provide transport *and* to pay to transport U.S. military working dogs stationed outside the U.S. back to the country after their deployment.[21] Significantly, the 2019 National Defense Authorization Act extended these and

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[18] Richard Blumenthal, "Blumenthal Announces Senate Passage of Amendment to Improve Treatment of Military Working Dogs, Vows to Continue Fight to Reclassify Dogs as Canine Members of The Armed Forces." 14 December 2012, available at: www.blumenthal.senate.gov/newsroom/press/release/blumenthal-announces-senate-passage-of-amendment-to-improve-treatment-of-military-working-dogs-vows-to-continue-fight-to-reclassify-dogs-as-canine-members-of-the-armed-forces. Accessed 19 June 2014.

[19] DogTime Staff, "Military Working Dogs Still Considered Equipment." *Dog Time,* 24 May 2013. Accessed 25 June 2015. Available at: dogtime.com/trending/17767-military-working-dogs-still-considered-equipment.

[20] 10 U.S.C. Sec 2583 - Military Animals: Transfer and Adoption. Available at: https://www.govregs.com/uscode/10/2583.

[21] H.R. 515 John S. McCain National Defense Authorization Act for Fiscal Year 2019, available at: https://www.congress.gov/bill/115th-congress/house-bill/5515.

previous policies on military working dogs to also apply to contract working dogs—those dogs deployed within the U.S. military, but provided through private companies. These changes in military policy provide important rhetorical and structural shifts that allow for more humane treatment of military working dogs, which many advocated for over the past decades. It is instructive to examine such shifts within the cultural and political contexts of the U.S. "war on terror" and through the lens of critical theory.

5 The Biopolitics and Zoopolitics Surrounding the Shifting Classification of Military Working Dogs

The shifts in policy around military working dogs is part of the larger biopolitics of the "war on terror." Michel Foucault defines biopower as a formation of power that positions some lives as important and deserving protection, and others as expendable.[22] For Foucault, "biopower" refers to a "soft technique" of power— the state's power to foster life or to "let die."[23] Dogs as literal animals, and as signifiers, are an important site for theorizing biopolitics. Biopower can work on animals through law (for example, Colin Dayan asks, "at what point are dogs legally recognizable, and when do they cease to count?"[24]) and through revalorization ("to make men dogs and dogs trash."[25])

Nicole Shukin extends Foucault's account of biopower to theorize "zoopolitics." For Shukin, zoopolitics describes how, within biopower, animal life is protected or rendered expendable.[26] In her theory of "technobioopower," Donna Haraway argues that humans, animals, and machines become together in overlapping "naturecultures."[27] She asks under these terms, which animals, and under which conditions, become disposable and killable, and which are given the right to health and life.[28] Haraway argues that "it is a misstep to separate the world's being into those who may be killed and those who may not and a misstep to pretend to live outside killing."[29] For Haraway, it is important to instead focus on questioning the ways in which someone or something is rendered as "killable." She argues that the way in which certain animals "become with" humans is central to these questions. Dogs, in specific, she claims, "in capitalist technoculture have acquired the 'right to health,' and the economic (as well as legal) implications are legion."[30] These theories of power are instructive for analyzing how the law can endow animals, and here, particularly dogs, with a right to life in being recognized as having a valuable life, and how the law can also position them as expendable.

The analysis in this paper thinks with these zoopolitical and technobiopolitical frameworks to consider how, under the terms of human exceptionalism and the sacrificial economy of the "war on terror" in Jacques Derrida's terms, military working

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[22] Michel Foucault. *Society Must Be Defended: Lectures at the Collège De France, 1975-1976* (Translated by David Macey, London: Penguin, 2003).
[23] *Ibid.*
[24] Colin Dayan, *The Law is a White Dog*: How Legal Rituals Make and Unmake Persons (Princeton UP. 2013, 213).
[25] *Ibid*, 241.
[26] Nicole Shukin, *Animal Capital: Rendering Life in Biopolitical Times* (U of Minnesota P, 2009)
[27] Donna Haraway, *When Species Meet* (U of Minnesota P, 2008).
[28] *Ibid*, 48.
[29] *Ibid,* 79.
[30] *Ibid,* 49.

dogs may be "killed, but not murdered."[31] Derrida argues that Western philosophical, religious, and scientific discourses reproduce an ideology of human exceptionalism—an ideology that creates the illusion of an "abyssal rupture" between man and animal, situating humans and animals as ontologically and epistemologically disparate in terms of ethical and moral questions. Under this framework, Derrida argues that man positions himself as sovereign over animals through what he calls "logocentrism," an ideology that defines humans as radically distinct from and superior to animals, based on humans' supposed unique capacity for self-conscious thinking and auto-reference.[32] He claims that logocentrism not only excludes animals from humanism's frames of subjectivity, but also excludes those human subjects positioned as being outside of this logocentrism through what he calls "carnophallogocentrism." Carnophallogocentrism refers to how animals as well as women, children, people of color, and those who are defined as not being capable of having "logos" are excluded from humanist formulations of subjectivity.

For Derrida, both frameworks produce a "sacrificial economy" that values human and humanized lives differently from those of animal others. The sacrificial economy of human exceptionalism establishes an economy of life that gives different value to human and animal life, permitting the non-criminal killing of animals.[33] According to Derrida, humans as well as animals may be rendered expendable within the sacrificial economy of carnophallogocentrism. He argues that this economy justifies killing humans who are animalized, considered not to have the "logos" that marks man as a superior and rational animal. How do these sacrificial economies map onto the position of dogs in U.S. military policy?

It is notable that these dogs have gained a more protected "right to life" through the recent shifts in military classification. In their shifting position from "military equipment" to "military animal," there is a shift in what Mel Chen calls the "animacy hierarchy," a perceptual system that orders life in relation to taxonomized levels of animacy, agency, and worthy life in relation to racialized, gendered, and sexualized systems of power.[34] While the dogs are given more of a "right to life" as "military animal" rather than "military equipment," they continue to be expendable as they are instrumentalized as part of U.S. militarism. Ultimately, the dogs are still regarded under the sacrificial economies of both war and human exceptionalism that Derrida outlines. It is important, then, to examine how the larger cultural contexts of the racialized sacrificial economies of the "war on terror" also inform the shifting position of these dogs in law and policy.

6 The Racialized Bio and Zoopolitics of Military Working Dogs' Recognition in US Military Policy

The backdrop of the U.S. "war on terror" and the elevated attention given to the role of U.S. military working dogs in this war—both in terms of protecting U.S. soldiers and in capturing and killing those labeled "terrorists" or "enemy targets" of the United States—was a key catalyst for the reclassification of, and shifting military policies

[31] Jacques Derrida, *The Beast & the Sovereign* (Chicago: U of Chicago P, 2009) & Jacques Derrida, *The Animal That Therefore I Am* (edited by Marie-Louis Mallet, translated by David Wills, Fordham UP, 2008).
[32] Jacques Derrida, *The Animal That Therefore I Am* (edited by Marie-Louis Mallet, translated by David Wills, Fordham UP, 2008, 94).
[33] *Ibid*, 34.
[34] Mel Y. Chen, *Animacies: Biopolitics, Racial Mattering, and Queer Affect* (Duke UP, 2012).

towards, military working dogs in the period between 2012-2021. The dogs were hypervisible heroes within U.S. public culture since 2011, in large part because of the role of Cairo, a U.S. military working dog, in the capture and killing of Osama bin Laden in Abbottabad Pakistan in May 2011.[35] Various media reports focused on the role of the dog in the killing. One piece reflected, for example, "The identities of all 80 members of the American commando team who thundered into Abbottabad, Pakistan, and killed Osama bin Laden are the subject of intense speculation, but perhaps none more so than the only member with four legs."[36] Another reported: "When it was revealed that one member of the elite commando team that raided Osama bin Laden's compound had four legs and a tail, the contributions of Military Working Dogs (MWDs) were thrust into a new light.[37] This increased attention is also reflected, for example, in the statistics around the adoption of these dogs. The number of dogs adopted doubled between 2011-2012 from 267 in 2011 to 557 in 2012.[38] It was only after this highly public mission and attention given to military working dogs that they received the kind of hyper-recognition that helped drive public appeals to support the shifting classification of these dogs in U.S. military policy.

Much of the appeals for shifting military policy around these dogs rested on claims about the dogs as "sacrificing heroes" who risk their lives for the military and its nationalist goals.[39] These appeals also focused on the way in which military working dogs, especially since 2001 have been central to the military's work to attack, capture, and kill "terrorists." There was again an increased influence of, and intensified focus on, military working dogs in the aftermath of the role of Conan, another military working dog, in aiding the U.S military in capturing and killing Abu Bakr al-Baghdadi, one of the leaders of ISIS, in Syria in October 2019.[40]

It is important to situate these legal shifts and appeals, then, in the context of the racialized biopolitics and zoopolitics of the U.S. "war on terror." The biopolitics of the "war on terror" positions not only certain non-human animal life, but also human American lives as important and deserving protection, and human Middle Eastern lives as expendable.[41] These biopolitical formations function through a technique of racialization that groups together Muslim, Arab, and Middle Eastern people together under the sign of "terrorist."[42]

Considering these contexts for the construction of "enemy others" in this war along with the bio/zoopolitical shifts around dogs during the "war on terror" helps illuminate the entanglements of animality, nationalism, and war, in determining how

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[35] Garth Johnston, 2011. Awwww: A War Dog Helped Take Out Osama. *Gothamist,* available at: https://gothamist.com/news/awww-a-war-dog-helped-take-out-osama Accessed 12 May 2016.
[36] Gardiner Harris, "Who's the Dog Hero of the Raid on Bin Laden?" *The New York Times*. 5 May 2011. Available at: www.nytimes.com/2011/05/05/science/05dog.html. Accessed 29 Dec. 2014.
[37] "Canine Members of the Armed Forces Act." *Animal Welfare Institute,* awionline.org/content/canine-members-armed-forces-act. Accessed 11 Oct. 2018.
[38] U.S. Government Accountability Office, Department of Defense: "Medical Conditions and Care for End- of-Service Military Working Dogs," (GAO-17-358), (Washington, DC March 10, 2017), available at: https://www.gao.gov/products/GAO-17-358.
[39] For more analysis of this framing, see: Chloe Diamond-Lenow "US Military Nationalism and the Intimate Public Sphere: The Role of the Dog in US Militarism" *Journal of Intercultural Studies* (2020) 41(1) 8-23, DOI: 10.1080/07256868.2019.1617255.
[40] Ana Redelat, "Courageous K-9 in ISIS Raid Boosts Blumenthal Effort on Military Dogs," The CT Mirror, October 28, 2019; available at: https://ctmirror.org/2019/10/28/courageous-k-9-boosts-in-isis-raid-boosts-blumenthal-efforts-on-military-dogs/.
[41] For more analysis of these contexts, see for example, Judith Butler, *Frames of War: When Is Life Grievable?* (Verso, 2010).
[42] Leti Volpp, "The Citizen and the Terrorist" ed. Edited by Mary L. Dudziak, *September 11 in History: A Watershed Moment?* (Duke UP, 2003, 147–162).

military working dogs gain a certain limited "right to life" through U.S. military policy. These contexts depend on co-constitutive stories and frames of race and species. Animalization and dehumanization are central to the framing of Arab/Muslim/Middle Eastern people as being closer to nature, barbarism and animality in the "war on terror." This is part of the work of orientalism, which Edward Said argues discursively constructs the "West" as being "civilized and human(e)," the "East" is "sub-human, inhuman(e) and closer to a position of animality."[43] Such racialized formations are central to the biopolitics of Islamophobia, imperialism, and militarism in the U.S. "war on terror."

It seems that military working dogs emerge as having a "right to life" within U.S. military policy not only because of their individual work and effort, but because of their role in supporting a larger military nationalist project predicated on the discursive and ideological construction of the expendable and killable "terrorist other." These dogs are framed as having "worthy" lives as they "save" American lives within the sacrificial economies of the racialized biopolitics of the "war on terror" that constructs certain humanized American life as more worthy under frames of Islamophobia and white supremacy and valuable than Middle Eastern life, especially those constructed the "the terrorist other." This analysis demonstrates the importance of legal approaches to, and analyses of, animals in war should also always attend to questions of race and nation in considering the cultural contexts for bio and zoopolitical entanglements.

While recognizing military working dogs as (animal) "subjects," rather than "objects" is a productive step towards more humane treatment of the dogs, these dogs are still positioned within what Derrida calls sacrificial economy of human exceptionalism. While the elevation of these dogs from object to (animal) subject in U.S. military law seems to offer a potentially productive fracture of the sacrificial economies of human exceptionalism, this subjectification does not wholly shatter the constructed disposability of these dogs. The dogs continue to be mobilized at the frontlines of war as potentially disposable tools that gain importance because of their role in protecting U.S. soldiers, and by extension, citizens. Training these dogs to kill and be killed—can never be a wholly ethical project with the dogs' well-being at the forefront.

Examining discourses about dogs, and practices involving them, is instructive for examining how discourses of humanity, public life, war, and law establish which lives, and under which conditions, become disposable and killable, and which are given the right to health and life.

7 No Dog Left Behind: The 2021 U.S. Withdrawal from Afghanistan and Contract Working Dogs

The U.S. military's August 2021 withdrawal from Afghanistan marked an important moment in the public debate around, and coverage of, the treatment of U.S. military working dogs and the broader contexts of the "war on terror" in which these dogs were deployed. The controversial and chaotic withdrawal marked the end of the United States' 20-year war and was largely regarded as a failure, with the Taliban regaining control of Afghanistan amidst the military's evacuation.

Scenes from Hamid Karzai International Airport, where the U.S. military organized its evacuation efforts reverberated across international news. The U.S.

[43] Edward Said, *Orientalism* (Vintage, 1978, 109).

military left many Afghan and foreign allies behind. Thousands of Afghans tried to join US military planes leaving the Kabul airport, even running onto the tarmac, and gripping onto the wings and engines of the planes as they departed. Reports about these incidents circulated widely across U.S. news media, with much attention given to the ways in which the U.S. failed to support many of those who had supported and worked with the U.S. military during its time in Afghanistan.

Amidst this context, reports also circulated that the U.S. military left some of its own military working dogs behind at the airport, counter to the policy established under Robby's Law. These reports were largely based on information provided by the Kabul Small Animal Rescue, a rescue organization based in Kabul, Afghanistan, founded by U.S. citizen, Charlotte Maxwell-Jones. Through Kabul Small Animal Rescue, Maxwell-Jones attempted to evacuate about 150 dogs, some of whom were pets and strays, while about 50, she claimed, were contract military working dogs.[44] Maxwell-Jones said she arranged a private charter plane for the dogs, but that one never arrived, and that she appealed to the U.S. military to have the dogs evacuated on one of their planes, which they were unable to do. After the last U.S. evacuation plane left, the dogs remained at the Kabul airport. The Kabul Small Animal Rescue tweeted an image of crates of these dogs at the Kabul airport appealing for help to transport the dogs out of Afghanistan. The tweet subsequently went viral.

Animal rights organizations, including PETA, the American Humane Society, and the Society for Prevention against Cruelty to Animals International[45] released statements condemning the U.S. military for leaving these military dogs in Kabul. PETA's petition stated, for example,

> Dozens of US military working dogs, numerous animal companions belonging to evacuated Americans, and more than 100 dogs previously rescued from the streets of Afghanistan along with an unknown number of rescued cats and the humans caring for these animals were left behind in Afghanistan after the last US plane left Hamid Karzai International Airport in Kabul.[46]

In response to the increasing attention given to the military dogs allegedly left behind in Afghanistan, the Pentagon released an official statement, claiming that it did not abandon any military working dogs, and that the dogs left were not military working dogs, but rather U.S. military contract working dogs.[47] They also clarified that they did not leave these dogs in kennels, as some had reported, but instead had

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[44] Philip Walter Wellman, "American Rescue Clinic Founder Stays in Afghanistan to Pursue Evacuation for Staff and Animals Left Behind." *Stars and Stripes*, 1 Sept. 2021. Accessed 14 March 2023.

[45] "Urgent Update and Action Plan from Charlotte & Kabul Small Animal Rescue (KSAR)," *The Society for the Prevention of Cruelty Against Animals International* (N.D.). Accessed 14 March 2023. Available at: https://www.spcai.org/news/press/urgent-update-and-action-plan-from-charlotte-kabul-small-animal-rescue-ksar.

[46] "Update on Dogs in Afghanistan: U.S. Army Responds to PETA." *People for the Ethical Treatment of Animals* (N.D.). Accessed 14 March 2023. Available at: https://www.peta.org/action/action-alerts/update/.

[47] Elizabeth Howe, "No US Military Dogs Were Left Behind in Afghanistan, DOD Says." *Defense One*, 31 August 2021. Accessed 14 March 2023. Available at: https://www.defenseone.com/threats/2021/08/no-us-military-dogs-were-left-behind-afghanistan-dod-says/184984/.

released the dogs in an enclosed area at the Kabul airport.[48] The Pentagon claimed that Maxwell-Jones brought the dogs to the airport in crates and asked the U.S. military to transport them on military evacuation flights, which they were unable to do. The transportation of these dogs was also complicated by a U.S. ban on transporting dogs internationally because of COVID restrictions.[49]

Importantly, because they claimed the dogs were not the military's property, but rather, belonged to contractors, the military claimed they were not responsible for these dogs, counter to the policies established in 2019. The American Humane Society responded with an appeal to Congress to classify non-military private contractor dogs in the same way military working dogs are classified.[50]

The case again reveals the tenuous position of military working dogs in U.S. law and military policy. The differential treatment and status of these dogs reveals the military's lack of commitment to the overall welfare of the animals it uses. Though respected and celebrated in public discourse, the dogs continue to be rendered through a politics of disposability in their status as animals.

8 Robot Dogs and the Future of Military Working Dogs

The creation and use of "robot dogs" by the U.S. military and private contractors since 2020 provides a fascinating context in which to consider the politics and practices of using working dogs in the U.S. military. "Robot dogs," officially referred to as Quadrupedal Unmanned Ground Vehicle (QUGV), are four-legged robots that have been recently developed and tested on military bases. The machines are variously referred to as "Semi-autonomous canine[s]," [51] "DroneDog[s]" and "robotic security dog[s]."[52] They are, as one news article put it, part of the "U.S. military's growing ecosystem of robot dogs."[53]

It is notable that at a time when warfare has been increasingly technologized and depersonalized, these new robots have been created in the image and practice, of dogs—sentimental and cute figurations. Various military and security contractors, including Ghost Robotics, ASYLON, and Boston Dynamics developed the dogs. Boston Dynamics calls theirs "Spot,"[54] drawing on a generic and lovable dog's name. They are generally used for surveillance and patrol.[55] The deployment of these "robot dogs" in

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[48] Stephen Losey, "Pentagon Denies It Left Military Dogs Behind in Afghanistan." *Military.com*, 31 Aug. 2021. Available at: https://www.military.com/daily-news/2021/08/31/pentagon-denies-military-dogs-were-left-behind-afghanistan.html.

[49] Melissa Chan, "There's a Travel Ban on Dogs from More Than 100 Countries, and You Can Blame COVID-19." Time, 10 Nov. 2021.

[50] "American Humane Condemns Death Sentence Delivered to Contract Working Dogs Left Behind in Kabul, Afghanistan" American Humane, 30 Aug. 2021. Accessed 14 March 2023.

[51] https://www.dvidshub.net/image/7652047/semi-autonomous-canine-enhances-security-cape-cod-space-force-station.

[52] "Semi-Autonomous Canine Enhances Security at Cape Cod Space Force Station." Defense Visual Information Distribution Service, 24 Feb. 2023, Accessed 14 March 2023. Available at: https://www.dvidshub.net/image/7652047/semi-autonomous-canine-enhances-security-cape-cod-space-force-station.

[53] Jared Keller, "Robot Dogs are Taking Over the US Military: Who Let the Dogs Out?" Task and Purpose, 1 March 2023. Accessed 14 March 2023. Available at: https://taskandpurpose.com/tech-tactics/robot-dogs/.

[54] "Spot for Industrial Inspections" *Boston Dynamics* (N.D.). Accessed 14 March 2023. Available at: https://www.bostondynamics.com/solutions/inspection.

[55] Jared Keller, "Robot Dogs are Taking Over the US Military: Who Let the Dogs Out?" Task and Purpose, 1 March 2023. Accessed 14 March 2023. Available at: https://taskandpurpose.com/tech-tactics/robot-dogs/.

the US military has broader implications for other U.S. and global security practices. The "robot dogs" were originally developed for use in border patrol.[56] They have also been used by U.S. police forces.

It is not clear what the robot dogs will mean for the future of the military working dog program in the U.S. or more broadly. It is likely that these machines will be used in concert with, but not as a replacement for, military working dogs. It is clear, however, that these robot dogs will be used within the same militarized project as military working dogs. While, in a generous reading, this may allow for less demand for military working dogs, the use of both robots and dogs should be situated within the broader racialized biopolitical contexts of the "war on terror," a project dependent on, in Derrida's words, the sacrificial economies of carnophallogocentrism and war, which is always already structured through an economy of disposability for human and non-human animals. The robot dogs will be used alongside military working dogs for warfare and ultimately in support of state violence.

This analysis of military working dogs and robot dogs has important implications for those interested in legal and political analyses of the use of animals in war as it insists on an intersectional analysis of the politics of war, race, nation, and animal rights. Whether in relation to the newly emerging "drone dogs" or the continued deployment of military working dogs, there is a clear continued dependence on canines within U.S. military endeavors. Intersectional feminist animal studies provide tools to theorize and enact more just multispecies futures for these dogs, and for broader practices in relation to war and the nation.

[56] Gavin Kenneally, "We Created Robot Dogs to Patrol the Border" Newsweek, 27 Jan. 2022. Accessed 14 March 2023. Available at: https://www.newsweek.com/robot-dogs-patrol-us-border-1681325.

The Inescapable Harms of Animal Agriculture: How Might Sanctuaries Respond to Threats from Climate Disasters and Diseases

Stephanie Eccles and Darren Chang

Abstract: Farmed animal sanctuaries are upheld as refuges, spaces demarcated materially and discursively, where formerly farmed animals have the right to grow old, participate in multispecies communities and collaborate in larger political projects that imagine the *freedom* for all and resistance against animal exploitation. Sanctuaries disengage and agitate against food production narratives of how these animals ought to live both spatially and relationally. However, the reach of the animal agriculture industry is creeping into sanctuary spaces through ever-increasing risks such as diseases (e.g., avian influenza), the climate crisis (e.g., fires and floods), and other disaster events, revealing inescapable harms that must be addressed.

This article considers the shared, albeit unevenly experienced vulnerability to disasters for farmed animals, as well as what the inescapable harms imposed by animal agriculture mean for sanctuaries. We first identify human sovereignty as the source of intensifying crises and disasters that sanctuaries are forced to confront, as well as the overarching context that sanctuaries are operating within. Following that, we engage with biological and climate disasters as two main case studies, examining how sanctuaries have responded to them, and what alternative actions sanctuaries could take. Finally, we consider how sanctuaries might take up the labor and responsibility of participating in broader struggles for institutional change beyond the sanctuary-gate, educating people about the relationships between the climate crisis, disease risk, and all scales of farmed animal production and the subsequent challenges they pose to sanctuaries. Through a multispecies justice framework, we suggest that disaster events represent key opportunities for sanctuaries to engage with the political project of ending animal production at all scales to ensure a safer future for humans and more-than-humans alike.

Keywords: Animal agriculture; sanctuaries; farmed animals; climate change; disasters; multispecies justice.

1 Introduction

In his critical discussions regarding the role of animal sanctuaries, Timothy Pachirat asks how might animal advocates reconcile a conceptualization of sanctuary as a secluded, sacred protective space, with a strategic and instrumental understanding of sanctuary "not as utopian (no-place) refuge but as specific staging grounds for resistance?"[1] With regards to the latter, Pachirat cites the *Oxford Essential Dictionary of the US Military (2001)*, which states that sanctuary is "a nation or area near or contiguous to the combat area that, by tacit agreement between the warring powers, is

[1] Timothy Pachirat, "Sanctuary," in *Critical Terms for Animal Studies,* ed. Lori Gruen (Chicago: The University of Chicago Press, 2018), 338.

exempt from attack and therefore serves as a refuge for staging, logistics, or other activities of the combatant powers."[2] We want to hold on to the idea of sanctuary as a space of resistance as Pachirat conceptualizes it, while at the same time push back on the definition he has cited; we observe that sanctuaries are in fact not immune to direct or indirect assaults from animal agriculture. Sanctuaries could never fully escape from the harms of animal agriculture largely due to the animal-industrial complex's regulatory capture of political and legal institutions, and because of the emerging disasters that the industry is complicit in reproducing, such as zoonotic disease outbreaks, fires, floods, and other crises pervade all boundaries. Our aim here is to first make a theoretical case for how and why the destructive impacts of animal agriculture against animals could be considered a war that continues through human sovereignty, then highlight how animal sanctuaries have struggled with these challenges to offer some material observations of "how precarious the sanctuary vision for animal futures can be."[3]

We begin by establishing this broader context of war and conflict between humans and animals in the first section, which offers a productive framework for our analysis on the entanglements between animals, sanctuaries, and the threats of animal agriculture. Specifically, we draw on Dinesh Wadiwel's theorizing of the ways in which humans are waging a biopolitical war against animals legitimized through a totalizing human sovereignty, to examine how farmed animal sanctuaries are simultaneously resisting yet forced to reproduce harms towards animals during times of disasters and crises.[4] In section two, we provide an overview of a range of direct and indirect threats emanating from animal agriculture, how sanctuaries have responded to these threats in practice, and the challenges sanctuaries have faced in their responses. In this section, we seek to expand how animals are discussed in relation to disaster events. In the animal disaster literature, there are four broad categories of animals: (1) companion animals; (2) farmed animals; (3) other captive animals such as those held in entertainment complexes or research facilities; and (4) wildlife.[5] Our intervention is motivated to capture how formerly farmed animals or sanctuary residents do not neatly fit into any of the four broad categories, thus we make a case for considering their unique and distinct experiences in disasters. In the third and final section, we return to Pachirat's envisioning of animal sanctuaries as resistive sites and consider the liberatory promises of sanctuaries through a multispecies justice lens.[6]

2 Frame of Analysis: The Crisis of Human Sovereignty

Critics of industrial animal farming and other animal exploitation industries have long recognized that these industries are not just systematically and institutionally violent against animals, but cause harm for many humans and our shared environment as well. A recent example of such analysis could be found in David Nibert and Sue Coe's co-edited two volumes entitled *Animal Oppression and Capitalism* (2017), where contributors discuss topics ranging from the highly dangerous and at times deadly

[2] Pachirat, "Sanctuary," 337.
[3] Elan Abrell, *Saving Animals: Multispecies Ecologies of Rescue and Care* (Minneapolis: University of Minnesota Press, 2021), 197.
[4] Dinesh Wadiwel, *The War against Animals* (Leiden, Boston: Brill, 2015).
[5] Irvine, Leslie. *Filling the ark: animal welfare in disasters*. Philadelphia, PA: Temple University Press, 2009.
[6] Danielle Celermajer, Sria Chatterjee, Alasdair Cochrane, Stefanie Fishel, Astrida Neimanis, Anne O'Brien, Susan Reid, Krithika Srinivasan, David Schlosberg, and Anik Waldow, "Justice Through a Multispecies Lens," *Contemporary Political Theory* 19, no. 3 (2020): 475–512.

labor that the efficiency of capitalist production imposes on slaughterhouse workers, to issues such as state capture by the animal-industrial complex, and the direct complicity of industrial animal farming on intensifying biodiversity loss and climate disasters.[7]

Within capitalist economies, the term "livestock" signifies not only the legally codified property status of farmed animals, but also how the animals are treated as commodities that could be bought and sold.[8] However, animal studies scholars who have applied Foucauldian analysis to examine the power relations between humans and animals have supplemented the above, pointing out that within spaces of animal exploitation, animals are not simply commodified beings, but also highly disciplined and controlled biopolitical subjects.[9] For instance, Chloë Taylor provides an overview of the mixture of powers that farmed animals in particular routinely face within agricultural settings: sovereign power (the right to kill), the disciplinary and regulatory dimensions of biopower (to foster life and let die), as well as pastoral power (domination through care and dependency).[10]

In *Society Must Be Defended*, a series of lectures from 1975-6, Michel Foucault proposes that in a scenario where the victors spare the lives of those they have conquered after a war, sovereignty becomes a means by which a relationship of domination between the victors and the spared is juridically legitimized; that is to say, what is foundational to sovereignty is the will of the conquered and defeated to prefer life (whether in domination, servitude, or slavery) over death, out of their fear of death.[11] This perspective suggests that relations of war and conflict actually continue beneath seemingly peaceable civil relations; beneath the rule of law, a secret and coded war wages on.[12] Consistent with this view, Foucault states elsewhere that "politics is war pursued by other means."[13]

Wadiwel applies this Foucauldian analysis above to reconceptualize sovereignty "as a mode of human domination of animals."[14] Human sovereignty manifests itself through the ways in which human dominion over animals is assumed and predetermined, such that ethical considerations could only attend to how we ought to use and relate to other animals, as opposed to whether any use and exploitation could be justified in the first place.[15] Further, Wadiwel argues that this sovereign rule over animals is "distinctly *biopolitical*," concerning itself with both the fostering of life and the enforcement of death.[16] Taken together, the existing relational conditions between humans and other animals is one in which human sovereignty enables a largely hidden and self-legitimizing biopolitical war against animals to continue, sustained and supported by various human institutions. We see this ever-increasingly in moments of

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[7] David Nibert and Sue Coe, *Animal Oppression and Capitalism* (Santa Barbara, California: Praeger, 2017).
[8] pattrice jones, "Property, Profit, and (Re)Production: A Bird's-Eye View," in *Animal Oppression and Capitalism*, ed. David Nibert and Sue Coe, (Santa Barbara, California: Praeger, 2017)
[9] Matthew Chrulew and Dinesh Joseph Wadiwel, *Foucault and Animals* (Boston: Brill, 2016).
[10] Chloë Taylor, "Foucault and Critical Animal Studies: Genealogies of Agricultural Power," *Philosophy Compass* 8, no. 6 (2013): 539–51.
[11] Michel Foucault, François Ewald, Alessandro Fontana, David Macey, and Mauro Bertani, *Society Must Be Defended: Lectures at the Collège de France, 1975-76* (London: Penguin, 2003), 95.
[12] Foucault, *Society Must be Defended*, 50-51.
[13] Foucault derives this statement by inverting Carl von Clausewitz's observation that "war is policy pursued by other means." For context, see Michel Foucault, *The History of Sexuality: Volume 1, an Introduction* (New York: Pantheon Books, 1978), 93.
[14] Wadiwel, *The War against Animals*, 21.
[15] Wadiwel, *The War against Animals*, 22.
[16] Wadiwel, *The War against Animals*, 24-25.

disasters, when human sovereignty circumvents any safety that sanctuaries are supposed to provide.

2.1 Positioning and Situating Farmed Animal Sanctuaries

We apply Wadiwel's framework and conceptualizations to produce an understanding of animal agriculture's direct exacerbation of climate catastrophes and spread of zoonotic diseases as part and parcel of the war against animals. Circling back to animal sanctuaries as sites of resistance, this framework helps us acknowledge how sanctuaries are forced to confront the various inescapable external forces manifested and sustained through human sovereignty. However, given that human sovereignty is all-pervasive, sanctuaries may often find themselves internally reproducing and replicating certain harms due to the coercive external structural forces. One example of this dynamic lies in the power that the state possesses in mandating the depopulating of animal residents at farmed animal sanctuaries amidst an avian influenza outbreak, as we illustrate in the sections to follow. These types of challenging and complex ethical decisions humans must make over the lives of animals are rooted in the same sovereign power that enables all other forms of violence towards animals, regardless of how much sanctuary staff and volunteers might work to resist them.

To give material substance to the human sovereignty we are referring to, which is imposed on sanctuaries, we consider two key intersections between sanctuaries and animal agricultural facilities: (1) supply chains and knowledge, and (2) spatiality. Together, these intersections produce and exasperate how sanctuaries experience disasters and impose short- and long-term challenges to the ethical and political projects of farmed animal sanctuaries.

Elan Abrell writes that "[s]anctuaries are embedded within many of the same political–economic systems of animal use that they seek to challenge, such as the animal agriculture industry and the animal entertainment industry."[17] Abrell notes how sanctuaries are dependent on the very same supply-chains that are embedded in the animal agriculture industry to provide food, housing materials (e.g., hay, woodchips), equipment and other resources such as veterinarian care and knowledge. One of the challenges of relying on these supply-chains is that they are oriented towards sustaining a particular kind of capitalist-farmed animal, one who is not meant to grow old.[18]

Dependency on the same supply-chains and resources including knowledge introduces several challenges for sanctuaries. A constant challenge sanctuaries face is accessing medical care for residents. Veterinarians servicing sanctuaries have developed much of their medical knowledge about farmed animals and spend the majority of their time in industrial farming spaces working within the demands of production. Their knowledge has to be translated and re-interpreted to be applied in sanctuary settings.[19] For example, in production spaces, a sick chicken will be 'culled' whereas in a sanctuary, a sick chicken is to be diagnosed, and treated for their ailment. Heather Rosenfeld argues that sanctuary medical care is an example of "undone science."[20] In their research on veterinarian care for sanctuary bird residents,

[17] Abrell, *Saving animals: Multispecies ecologies of rescue and care,* 18.
[18] Isa Leshko, *Allowed to Grow Old*. (University of Chicago Press, 2019).
[19] Heather Rosenfeld, "Witnessing Pandora: Doing" Undone Science" at Chicken Sanctuaries," Catalyst: Feminism, Theory, Technoscience 7, no. 2 (2021).
[20] Rosenfeld, "Witnessing Pandora: Doing" Undone Science" at Chicken Sanctuaries,"; Frickel, Scott, Sahra Gibbon, Jeff Howard, Joanna Kempner, Gwen Ottinger, and David J. Hess. "Undone science:

Rosenfeld was told by a sanctuary caregiver that the available medical knowledge at this point is "where human medicine was in the nineteenth century."[21]

Further, the food sourced for sanctuary residents is the product of agricultural science that has developed feed formulas to ensure maximum efficiency and feed-growth rations on farmed animals, ignoring the long-term health impacts on animals like rapid-weight gain. Despite the production-orientation of the supply chains and knowledge, sanctuaries have creatively engaged with and made efforts to "adapt[] this knowledge to their own needs," generating a groundswell of sanctuary-oriented knowledge.[22] Building this capacity and sanctuary-specific knowledge is integral to caring for formerly farmed animals.[23]

In addition, as highlighted in the growing body of farmed animal sanctuary literature, authors remark on how sanctuaries can conjure up the image of bucolic farm sung about in the jingle 'Old McDonald Had a Farm.'[24] Sanctuaries are most often spatially located in what are predominantly agricultural communities. The decision to operate a sanctuary in the midst of agricultural production is influenced by access to land, proximity to key resources, and dictated by legal institutions through zoning by-laws that spatially confine farmed animals to rural areas.[25]

Zoning bylaws function to limit the visibility of farmed animals and reduce the reach of sanctuaries' political messaging by relegating and confining both to rural areas.[26] This spatial confinement limits the material possibilities as well as the imagination for where farmed animals can live. The running argument supporting this spatial-fixing of where farmed animals can live is that urban environments would deprive farmed animals of their needs and prevent them from flourishing.[27] This belief has been challenged many times, notably by The Microsanctuary Movement that has pushed against spatially-fixing farmed animals to rural areas; however, this attempt of giving farmed animals a presence outside rural areas comes with numerous legal and social challenges for advocates who are moving farmed animals into urban, residential areas.

Sanctuary dependency on the same supply-chains, knowledge, and land as industrial farming production shape and govern sanctuaries reflect what Pachirat calls the "topography of enmity."[28] Access to food, resources, veterinarian care, urban spaces, and more are just a few of the limiting factors sanctuaries must navigate.

To return to Abrell's acknowledgement that sanctuaries are embedded in the same economic and political systems that were created and continue to be reproduced through agricultural industries, we propose extending this analysis to consider

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Charting social movement and civil society challenges to research agenda setting." *Science, Technology, & Human Values* 35, no. 4 (2010): 444-473.

[21] Rosenfeld, "Witnessing Pandora: Doing" Undone Science" at Chicken Sanctuaries," 2.

[22] Abrell, *Saving animals: Multispecies ecologies of rescue and care*, 69.

[23] The Open Sanctuary Project has championed this initiative developing online resources and guides for caregivers of formerly farmed animals to consult and contribute to. See www.opensanctuary.org

[24] Gene Baur, *Farm sanctuary: Changing hearts and minds about animals and food*, Simon and Schuster, 2008.

[25] At times sanctuaries even re-appropriate pre-existing agricultural production infrastructure such as barns. Sue Donaldson and Will Kymlicka, "Farmed animal sanctuaries: The heart of the movement," *Politics and Animals* 1, no. 1 (2015): 50-74.; Open Sanctuary Project, 'Know your sanctuaries zoning rights restrictions' (*Open Sanctuary*, 12 June 2018). <https://opensanctuary.org/know-your-sanctuarys-zoning-rights-restrictions/> accessed 10 December 2022.

[26] Darren Chang, 'Resisting Species Segregation: Integration, separation, and infiltration with farmed animals,' (MA Thesis, Queens University, 2018), 15.

[27] Darren Chang, 'Resisting Species Segregation: Integration, separation, and infiltration with farmed animals,' 15.

[28] Pachirat, "*Sanctuary*," 339.

broader ecological and biological relations between sanctuaries and industrial agricultural production. We extend the analysis to how some of the dependencies between sanctuaries and industrial production take on new meanings as hazards for sanctuary residents in the context of ongoing catastrophic disasters that sanctuaries are facing. By considering these additional relations, those that are biological and ecological in origin, we argue that the relationship between sanctuaries and disasters are expressions of direct and indirect attacks from the animal-industrial complex. Our goal in this paper is to build on our understanding of the *enduring legacies* of agricultural production on the lives of residents and explore what this means for the ethical and political projects of sanctuaries more broadly.

3 The Biological Disasters

In this section we will identify the link between zoonotic diseases, animal agriculture, and the capitalist farmed animals captive within these systems. We want to draw attention to how production relations are driving and distributing the biological threats, making sure to avoid turning the animals themselves into scapegoats.[29] We will follow this section by identifying an emerging issue for sanctuaries related to exposure to zoonotic diseases, particularly the highly pathogenic avian influenza (HPAI). By exploring this example, we will identify how sanctuaries are responding to such threats, tracing how the response is shaped by a globalized governance of agricultural production that does not care that sanctuary bird residents have been removed from production spaces and construe them as a threat to captive birds in production.

3.1 Industrial Agriculture and Zoonotic Diseases

The COVID-19 pandemic reinvigorated public interest in the relationship and potential for disease transmission between humans and animals. COVID-19 brought to the fore how human relations to animals are not just political or social, but also operate on biological scales. The emergence of COVID-19 in particular fueled racist and sinophobic rhetoric that led to violence and supported western imaginations of the correct consumption and relational practices between humans and animals, strategically weaponizing COVID-19 to distance western food production practices and diseases.[30]

However, COVID-19 is just one of many zoonotic diseases circulating in contemporary society, many of which can be traced to the western development of what are called concentrated animal feeding operations (CAFOs). According to the Food and Agricultural Organization (FAO), 60% of infectious diseases are zoonotic, and at least 75% of these diseases can move between species, including those that are reverse-zoonotic, such as when humans were the vector to transmitting COVID-19 to mink.[31]

Farmed animals' captivity in CAFOs can serve as the "epidemiological bridge" between human and other species, highlighting the key role these animals have in

[29] Charlotte E. Blattner, "From Zoonosis to Zoopolis," In *Derecho Animal. Forum of Animal Law Studies*, vol. 11, no. 4, pp. 41-53. 2020.
[30] Darren Chang and Lauren Corman, "Multispecies disposability: Taxonomies of power in a global pandemic," *Animal Studies Journal* 10, no. 1 (2021): 57-79.
[31] FAO, 'One Health,' (*FAO*, 1 December 2021) <https://www.fao.org/one-health/en> accessed 10 December 2022.

zoonotic disease transmission and mutations.[32] CAFOs produce animals with poor immune systems who are subject to stressful, confined, and concentrated living spaces. Compounding this situation, farmed animals live directly on top of their own waste. To address the adverse conditions, farmed animals have been fed or injected a cocktail of antibiotics, which has led to the crisis of antibiotic resistance.[33]

Between the concentrated living space and standardized immunocompromised animals, the ideal environment for transmission and mutations of diseases to occur is locked in. However, these drivers of zoonotic diseases are "within the farm gate."[34] According to Matthew Hayek, the attribution of zoonotic diseases to agriculture is actually "conservative" as only on-farm drivers are considered in these scenarios. If we factored in the "before and after the farm gate" impacts of agriculture, including "commodity-driven deforestation" that results in the loss of disease regulation, more emerging zoonotic diseases would likely be traced to animal agricultural production.[35] Despite having an impoverished estimate of the relationship between agricultural production and zoonotic diseases, scientists can say with certainty that over 50% of emerging zoonotic diseases are affiliated with industrial animal agriculture.[36] With global commitment to support more concentrated and confined agricultural facilities through what is called sustainable-intensification, the present moment and future can be described as stuck in the "infectious disease trap of animal agriculture."[37]

3.2 Sanctuaries and Their Zoonotic Attunement

As animal agricultural facilities navigate zoonotic diseases, so do farmed animal sanctuaries. What brings these two radically different spaces together is spatial proximity and housing genetically similar farmed animals. Pre-dating the COVID-19 pandemic, sanctuaries already have been engaged with "disease situations," such as zoonotic outbreaks or viral infections traced to residents' time in utero.[38] Abrell offers the concept of "necro-care," a type of care that functions through the management or control of other life such as pest control, to describe sanctuaries' attempts of mitigating external threats that can lead to potential "disease situations."[39] External threats can look like commensal species such as rats helping themselves to food bins and leaving behind shedding's of viruses, or undomesticated birds co-mingling with bird residents at the pond, or even through the arrival of a new resident not having been subject to a sufficient quarantine period.

Zoonotic attunement has increasingly become important for sanctuaries because of overarching institutions governing globalized food systems. Avian Influenza (AI), specifically Highly Pathogenic Avian Influenza (HPAI) is increasingly

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[32] Delia Grace, Bernard K. Bett, Hu Suk Lee, and Susan MacMillan, "Zoonoses: Blurred lines of emergent disease and ecosystem health," (2016).
[33] Matthew N. Hayek, "The infectious disease trap of animal agriculture," *Science Advances* 8, no. 44 (2022): eadd6681.
[34] Hayek, "The infectious disease trap of animal agriculture," 1.
[35] Serge Morand and Claire Lajaunie, "Outbreaks of Vector-Borne and Zoonotic Diseases Are Associated with Changes in Forest Cover and Oil Palm Expansion at Global Scale," *Frontiers in Veterinary Science* 8 (2021): 661063–661063.
[36] Jason R Rohr, Christopher B Barrett, David J Civitello, Meggan E Craft, Bryan Delius, Giulio A DeLeo, Peter J Hudson, et al., "Emerging Human Infectious Diseases and the Links to Global Food Production," *Nature Sustainability* 2, no. 6 (2019): 445–56.
[37] Hayek, "The infectious disease trap of animal agriculture."
[38] Steve Hinchliffe, Nick Bingham, John Allen, and Simon Carter, *Pathological lives: Disease, space and biopolitics*, John Wiley & Sons, 2016, 98.
[39] Abrell, *Saving animals: Multispecies ecologies of rescue and care*, 181.

becoming a challenge for sanctuaries to navigate as we reach the nearly endemic, or enzootic status globally.[40] HPAI presents unique issues for sanctuaries because it interacts with the 'topography of enmity' by redefining the conditions for spatial and relational configurations on sanctuaries. The two principal ways sanctuaries are experiencing HPAI is directly by avian influenza infecting the resident birds, or indirectly, by being in what is called a control or prevention zone.

The Open Sanctuary Project calls HPAI and similar zoonotic diseases examples of a "double-pronged threat."[41] The first deadly-prong is that if infected by HPAI or another strain of avian influenza, there is a very high chance that the bird residents will succumb to the virus. While death from the virus is not guaranteed, death itself usually is–the "second-prong."[42] If HPAI is detected in a given region, the region receives a "potentially deadly risk" classification, and all surrounding properties housing farmed animals are categorized as "at-risk."[43] Once labeled "at-risk," the surrounding facilities are under temporary emergency biosecurity measures ranging from forced confinement of birds to depopulating all birds, as they are potential vectors under scorched-earth policies. By considering matters of agency and freedom, we will turn to each scenario focusing on avian influenza.

The first scenario is when sanctuaries have confirmed HPAI on-sanctuary, marking their location as "infected premise."[44] In March 2022, Pumpkin Wall Farm Sanctuary located in New Hampshire was confirmed to be the point-source of HPAI in the region. After confirming with the state veterinarian that five turkeys who suddenly died had HPAI, state-workers arrived at the sanctuary, quickly isolating, and depopulating all 80 bird residents, regardless of their infection status. Brendena Fleming, founder of Pumpkin Wall Farm Sanctuary familiar with the criticisms surrounding the scientific effectiveness of "stamping-out," appealed to the state veterinarian to individually test the 75 birds for HPAI; however, the request was denied, and Fleming had no legal recourse to appeal.[45] Fleming's appeal joins in a larger scientific and agricultural production call against the stamping-out approach. In the United States, over 52.7 million birds were depopulated in 2022, marking this year as a new record. However, the "vast majority are being culled through flock

[40] Michelle Willie and Ian G. Barr, "Resurgence of avian influenza virus," *Science* 376, no. 6592 (2022): 459-460.
[41] Julia Magnus, 'Highly pathogenic avian influenza: Your sanctuary and the law,' (*The Open Sanctuary*, 21 April 2022) <https://opensanctuary.org/highly-pathogenic-avian-influenza-your-sanctuary-and-the-law/> accessed 10 December 2022.
[42] Magnus, 'Highly pathogenic avian influenza: Your sanctuary and the law.'
[43] Magnus, 'Highly pathogenic avian influenza: Your sanctuary and the law.'
[44] USDA, 'Highly pathogenic avian influenza (HPAI) response ready guide - Overview of zones,' (*USDA*, May 2017) <https://www.aphis.usda.gov/animal_health/emergency_management/downloads/hpai/hpai_zones.pdf> accessed 10 December 2022.
[45] Ryan Lessard, 'State to euthanize about 80 sanctuary farm birds after avian flu deaths,' (*Manchester Ink Link*, 17 March 2022) <https://manchesterinklink.com/state-to-euthanize-about-80-sanctuary-farm-birds-after-avian-flu-deaths/> accessed 10 December 2022. ; n.n, 'Birds at NH sanctuary euthanized due to avian influenza, ' (21 March 2022) <https://www.nbcboston.com/news/local/birds-at-nh-animal-sanctuary-euthanized-due-to-avian-flu/2674697> accessed 10 December 2022.

'depopulation.'"[46] Critiques against deploying the stamping-out policies are based on showing how it prioritizes economic over scientific or social values.[47]

The logic is that by "stamping out" all birds that are either infected or potentially exposed to the virus, the virus will effectively be eliminated from the region, returning the region to a disease-free status.[48] International markets, rather than scientific consensus inform the policy to "stamp out" all birds in an infection zone. During farmed animal disease outbreaks, the World Organization for Animal Health (OIE) highly encourages restricting the export of farmed animals (alive, or those disarticulated) from known containment zones. Additionally, countries can choose to introduce temporary embargoes against other countries or specific areas listed as having active farmed animal disease outbreaks: one such example happened in 2004, when the United States was under embargo from 44 importing countries banning the purchase of poultry from either the host-state or the US entirely.[49] Thus, by stamping-out or eliminating all birds in a containment zone, regions or countries are able to return to the status of being disease-free and regain access to the market as quickly as possible. At Pumpkin Wall Farm Sanctuary, the 5 confirmed infected birds, and the 75 other birds of unknown status represented a threat to the region, and possibly the entire country's agricultural production. Their tragic encounter with HPAI, and larger forces of international farmed animal health governance reveal a critical issue for farmed animal sanctuaries. Despite the birds living at Pumpkin Wall Farm Sanctuary, they were still subjected to the same biological control measures exercised in agricultural production, showing how sanctuaries and their residents remain embedded in larger animal production logics.

Another valuable insight this tragic incident illuminates is that regardless of bird residents' living in a sanctuary, the goal of providing a good death is not guaranteed. Sanctuaries are spaces where individual animals' lives are not just "background noise," but places where animals' lives are grievable and during the death-process, care is put into how animals may experience the end of their life.[50] At Pumpkin Wall Farm Sanctuary, residents' death was determined by external actors, and the birds were subjected to industry-killing methods. At sanctuaries, if residents do not die naturally, caregivers will typically request veterinarians to provide sedatives or pentobarbital, the pharmaceutical used by veterinarians to euthanize companion animals. However, this, and other medical interventions can be complicated by the legal categorization of farmed animals as "food animals" and impose restrictions on what medicines veterinarians can prescribe to them.[51]

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[46] Bill Chappel, 'What we know about the deadliest bird flu outbreak in history,' (*NPR*, 2 December 2022) <https://www.npr.org/2022/12/02/1140076426/what-we-know-about-the-deadliest-u-s-bird-flu-outbreak-in-history> accessed 10 December 2022.

[47] Terry L. Whiting, "Why must we rush to bury our dead (pigs): The option of excarnation by exposure," *The Canadian Veterinary Journal* 62, no. 12 (2021): 1309.

[48] WHO, 'Terrestrial code online access,' (*WHO*, 2021) <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmfile=chapitre_avian_influenza_viruses.htm> accessed 10 December 2022.

[49] Matthew J. MacLachlan, David Boussios, and Amy D. Hagerman, "Market Responses to Export Restrictions from Highly Pathogenic Avian Influenza Outbreaks," *Journal of Agricultural and Resource Economics* 47, no. 1 (2021): 209-224.

[50] Deborah Bird Rose, "In the shadows of all this death," in *Animal Death*, ed. Jay Johnston and Fiona Probyn-Rapsey, (Sydney University Press, 2013), 2.; Kathryn Gillespie, "Provocation from the field: A multispecies doula approach to death and dying," *Animal Studies Journal* 9, no. 1 (2020): 1-31.

[51] Rosenfeld, "Witnessing Pandora: Doing" Undone Science" at Chicken Sanctuaries."
; Scott Frickel, Sahra Gibbon, Jeff Howard, Joanna Kempner, Gwen Ottinger, and David J. Hess. "Undone Science: Charting Social Movement and Civil Society Challenges to Research Agenda Setting," *Science, Technology, & Human Values* 35, no. 4 (2010): 444–73.

Fleming was asked by the state veterinarian how she wanted the birds to be euthanized, to which she responded humanely and off-site. However, her request was not possible because it could further spread the virus. She was told it needed to be done as fast and quickly as possible. According to the HPAI Red Book, during a disease-outbreak, depopulation is favored over euthanasia.[52] According to the American Veterinary Medical Association (AVMA), "depopulation refers to the rapid destruction of a population of animals to respond to urgent circumstances with as much consideration to the welfare of animals as practicable."[53] Depopulation contrasts euthanasia according to the AVMA by sheer urgency of the "circumstance[] [that] may frustrate adherence to the Animal Welfare Principles or humane methods outlined in the AVMA Guidelines for the Euthanasia of animals."[54] Whatever happened between the 80 birds and state-workers deployed to exterminate their life to deactivate the potential virus within their bodies undercuts a goal of sanctuaries to provide a good death for residents.

Turning to the second scenario, sanctuaries can be externally threatened by agricultural production facilities by being located in control or prevention zones. Here With Us Farm Sanctuary in Pennsylvania was confined within a control or prevention zone. In a social media post to their followers in the spring of 2022, Here With Us Farm Sanctuary shared with their followers on social media that just 27 miles (or 43.5 km) away from their sanctuary, at least 1.4 million individual laying hens were depopulated because of either a confirmed case or exposure to HPAI.[55] This meant that their sanctuary was categorized as an *at-risk premise*. In the United States context, this means that there are temporary imposed movement controls and surveillance measures, typically communicated through a letter in the mail or a visit from the appropriate department.

Included in such letters is typically a mandate to follow the "no birds out, no birds in" protocol. *No birds out* translates to the requirement that all birds must be enclosed and quarantined from external ecologies to effectively reduce the transmission routes of avian influenza. Here With Us Sanctuary designed enclosures with canopy roofs effectively quarantining the bird residents from external animals, both other residents and visitors such as wild birds. The *no birds in* prohibits sanctuaries from welcoming new bird residents. Part of why the sanctuary took to social media to share the imposed disease management requirements was because the imposed measures introduced an infrastructural problem on the sanctuary. A central objective of farmed animal sanctuaries is to allow residents to be "as free as possible," in the words of co-founder of VINE Sanctuary, Miriam Jones.[56] This means that residents should face very few barriers in deciding where they want to spend time, or who they want to spend their time with. As was put in a Farm Sanctuary blog post, we are seeing the transformation of the favored pond to the "area [...] that poses the greatest risk of infection."[57]

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[52] USDA. *Highly Pathogenic Avian Influenza Response: The Red Book*. USDA. 2018.
[53] AVMA. *AVMA Guidelines for the Depopulation of Animals: 2019 Edition*. AVMA, 2019.
[54] AVMA, *Guidelines for the Depopulation of Animals: 2019 Edition*, 4-5.
[55] Here With Us Farm Sanctuary, "We have a very important DONATION MATCH. Please read below to find out why". Facebook, April 18, 2022. https://www.facebook.com/herewithusfarmsanctuary/.
[56] Miriam Jones, "Captivity in the context of a sanctuary for formerly farmed animals," *The ethics of captivity* (2014): 90-101, 91.
[57] Susie Coston, 'What you need to know about Avian Flu,' (*Farm Sanctuary Blog*, 1 May 2015) <https://blog.farmsanctuary.org/2015/05/what-you-need-to-know-about-avian-influenza/> accessed 10 December 2022.

Avian influenza and the accompanying unprecedented government-enforced measures significantly impact animal agency and freedom at sanctuaries. Farmed animal sanctuaries attempt to expand freedom for residents by removing obstacles to residents' movement. Sanctuaries do factor in the risks, but tend to prioritize "the benefit[s]" of "a much richer and more stimulating environment for the animals, one that allows them to test and extend their capacities, and to exercise some control about the extent of contact with humans and other animals."[58] Sanctuaries have been able to navigate risks; however, disease outbreaks that siege agricultural production, accompanied by temporary biosecurity measures circumscribe sanctuaries' abilities to make decisions for their residents. The liberated bird once again becomes a victim of animal agriculture production.

Some sanctuaries have approached biological threats through building in safety mechanisms and protocols; unfortunately, as HPAI and other viruses become endemic, the likelihood that these temporary measures become ordinary operational procedures appears likely. Globally, zoonotic diseases are becoming more of an endemic feature of industrial animal agriculture, prompting research into a universal vaccine to be used in production settings.[59] The promise of a vaccine "offers a targeted, biological approach that bypasses the ecological, social, and economic conditions of virus emergence and spread," that "decontextualized the virus from its social relations from hosts and habits."[60] This leaves sanctuaries in a status of dependency and waiting for a 'better future' under a regime less interested in reducing the possibilities of zoonotic viruses, and searching instead for strategies that merely react to the risk. Perhaps the vaccines will arrive and be distributed evenly across farmed animals, both for those in production and those that are living as free as possible. For now, sanctuaries are left in a precarious position where they must first consider if they will respond to ongoing disease threats at all, and secondly, if they do, how will they navigate and preserve the goals of sanctuaries (e.g., freedom, agency) in these new conditions?

The global response to disease threats, as governed by interests to reproduce agricultural production and sustain market access, pose real risks to sanctuaries as they threaten decision-making and redefine the possibilities of sanctuaries. Natalie Porter writes that biosecurity is "less about blocking biological exchanges than it is about promoting 'good' biological exchanges."[61] Underscoring the idea about 'good' biological exchanges is the recognition that human-farmed animal relations are relational, and importantly, risky. However, this elevated risk is due to a particular human-farmed animal relation that is shaped by industrial food systems that produce the conditions for diseases. To live with the risk, agriculturalists introduce biosecurity protocols that enforce the "public health principle of social distancing and applying it across species."[62] Thus, the primary way to manage risk is to restructure encounters between humans and farmed animals through mechanisms that distance and enclose both actors.

Going forward, we can expect further efforts to "restrict pathogen circulation" by restricting economically unproductive risky relations such as formerly farmed birds

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[58] Donaldson and Kymlicka, "Farmed animal sanctuaries: The heart of the movement," 61.
[59] Shravan Singh Rathore, Hem Singh Gehlot, Gyan Prakash, and Jayashree S. Nandi, "Epizootic, Endemic and Pandemic Zoonotic Viral Infections," *Journal of Biosciences and Medicines* 10, no. 3 (2022): 90-96.
[60] Natalie Porter, *Viral economies: bird flu experiments in Vietnam*, (University of Chicago Press, 2019), 65.
[61] Porter, *Viral economies: bird flu experiments in Vietnam*, 36.
[62] Porter, *Viral economies: bird flu experiments in Vietnam*, 37.

and humans together at a sanctuary.[63] Porter's book is primarily concerned with non-commercial subsistence agriculturalists in Vietnam who are seeing their livelihoods foreclosed with the introduction of industrial farming as a national strategy to mitigate zoonotic risk. We can extend this concern to places of sanctuary that are similarly trying to have alternative relations with farmed animals that look very different from those found on a commercial farm. Just as the introduction of commercial farming rests on the promise to secure public health threats from infected poultry in Vietnam, we are starting to see global government-led interventions mandating free-ranging birds be enclosed during outbreaks of avian influenza that are gradually becoming globally endemic. Therefore, we are seeing the proliferation and prioritization of a particular human-farmed animal relation that holds the power to determine that other ways of relating to farmed animals are "bio-insecure" to its production system and must be slowly stamped out.[64]

4 The Climate Crisis

Extreme weather events are more frequent and intense, amplified by the climate crisis, which is itself fueled by extractive and exploitative relations with the earth. The living archive of the Anthropocene is added to each day with a new story of a flood, a drought, a fire, a heat wave and the attendant initial and secondary impacts to human and more-than-human communities. The devastation does not solely come from encountering the elements, but also the failure of material infrastructure, governments, the private-sector, or absence of solidarity from social institutions. The devastation can be aggravated by the disaster response itself (e.g., poor handling of mass mortality can cause secondary environmental issues). It is not that these are random failings or events, but rather the conditions of living in the Anthropocene.[65] Similar to how zoonotic diseases are responded to, extreme weather event responses are geared towards returning agricultural producers to production as quickly as possible instead of grappling with the nuances of the disaster-event, or building back differently in ways that would meaningfully address the hazards contributing to the vulnerability, such as being located in a flood zone.[66]

4.1 Animal Agriculture as a Driver of the Climate Crisis

According to the Food and Agriculture Organization of the United Nations (FAO), agriculture is responsible for at least 14.5% of total Greenhouse Gas (GHG) emissions.[67] Recent and a more comprehensive analysis has adjusted the 14.5% to 34-35%, and of those emissions, 57% is associated with animal-sourced production.[68] In

[63] Porter, *Viral economies: bird flu experiments in Vietnam*, 37.
[64] Steve Hinchliffe and Nick Bingham, "Securing life: the emerging practices of biosecurity," *Environment and Planning A* 40, no. 7 (2008): 1534-1551,1543.
[65] Danielle Celermajer, *Summertime: Reflections on a Vanishing Future*, (Hamish Hamilton, 2021).
[66] Sam Rowan, "Extreme weather and climate policy," *Environmental Politics* (2022): 1-24.; Eccles, Stephanie and Stoddard, Lisa, "Troubling the Legal Standing of Farmed Animals During a Disaster," Forthcoming.
[67] PJ Gerber, Steinfeld H, Henderson B, Mottet A, Opio C, Dijkman J, et al., "Tackling Climate Change through Livestock: A global assessment of emissions and mitigation opportunities," Food and Agriculture Organization of the United Nations; 2013. Available from: http://www.fao.org/3/i3437e/i3437e.pdf.
[68] M. Crippa, E. Solazzo, D. Guizzardi, F. Monforti-Ferrario, F. N. Tubiello, and A. Leip, "Food Systems Are Responsible for a Third of Global Anthropogenic GHG Emissions," *Nature Food* 2, no. 3

terms of total food emissions, animal agriculture is estimated to account for over half of all food-related GHG emissions despite only providing 37% of protein and 18% of calories globally.[69] Animal agriculture is following a trajectory that will account for 37-49% of the global GHG budget by 2030 if the sector continues 'business as usual.'[70] Critical to note is that additionally, animal agriculture is responsible for 44% of total methane (CH_4) emissions, and nitrous oxide (N_2O), another important GHGs. Methane and nitrous oxide are increasingly being discussed in relation to 'tipping points,' defined by the IPCC as: "critical thresholds in a system that, when exceeded, can lead to a significant change in the state of the system, often with an understanding that the change is irreversible."[71]

Moving beyond a focus on emission-related activities, animal agriculture is considered the driving force behind the defaunation of our planet, resulting in biodiversity loss, the leading cause for emerging infectious diseases, acidification, eutrophication, and is a chief consumer of natural resources including land and water.[72] It is estimated that animal agriculture requires just over one-fourth of all habitable land, and the remaining land is fragmented in ways that leave very little space for animals to live.[73] As emissions accumulate, resources are depleted and land-use patterns are changed to meet the demands of agricultural production, extreme weather moves into these vulnerable, fragmented, and changing ecosystems.

Not only is the capitalist agricultural food system a primary sector driving the climate crisis, it is simultaneously also a "victim" to the climate crisis.[74] Ranging from uncertainty surrounding access to water, arable land, and labor resources to the arrival of extreme weather events, agricultural production is a sector that is highly impacted by climate change.[75] The impacts of the climate crisis on agriculture are thus of grave concern according to the FAO.[76] Extreme weather events are most often discussed as massive economic catastrophes, but underneath discussions of economic losses are grave social and ecological impacts, including the death of millions of farmed animals annually from immediate or secondary impacts. Photojournalists such as those working at WeAnimals have been instrumental in helping the public "look beyond the numbers" and see what the losses of millions of farmed animals in concentrated areas

(2021): 198–209.; Xiaoming Xu, Prateek Sharma, Shijie Shu, Tzu-Shun Lin, Philippe Ciais, Francesco N. Tubiello, Pete Smith, Nelson Campbell, and Atul K. Jain, "Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods," *Nature Food* 2, no. 9 (2021): 724-732.

[69] Joseph Poore and Thomas Nemecek, "Reducing food's environmental impacts through producers and consumers," *Science* 360, no. 6392 (2018): 987-992.

[70] Helen Harwatt, "Including animal to plant protein shifts in climate change mitigation policy: a proposed three-step strategy," *Climate Policy* 19, no. 5 (2019): 533-541.

[71] Ove Hoegh-Guldberg, Daniela Jacob, M. Bindi, S. Brown, I. Camilloni, A. Diedhiou, R. Djalante et al., "Impacts of 1.5 C global warming on natural and human systems," *Global warming of 1.5° C.* (2018).

[72] Poore, and Nemecek, "Reducing food's environmental impacts through producers and consumers.".; Michael B. Eisen and Patrick O. Brown, "Rapid global phaseout of animal agriculture has the potential to stabilize greenhouse gas levels for 30 years and offset 68 percent of CO2 emissions this century," *PLoS Climate* 1, no. 2 (2022): e0000010.

[73] Ritchie, Hannah and Roser, Max, 'Land Use,' (Our World in Data, 2019 September) <https://ourworldindata.org/land-use> accessed 10 December 2022.

[74] Johan Rockström, Ottmar Edenhofer, Juliana Gaertner, and Fabrice DeClerck, "Planet-proofing the global food system," *Nature Food* 1, no. 1 (2020): 3-5.

[75] Xiao Zhang and Ximing Cai, "Climate change impacts on global agricultural land availability," *Environmental Research Letters* 6, no. 1 (2011): 014014.

[76] FAO. 2021. *The impact of disasters and crises on agriculture and food security: 2021*. Rome.

mean socially and ecologically.[77] James Sawyer and Gerardo Huertas write, "[t]he silent disaster that unfolds in the backdrop to the human story is one that is often unseen by those who have the power to make a difference."[78] Photojournalists work to capture and make public knowledge of the "silent disasters," resist the erasure of individual animals' lives referred to in the media as "lost inventory," while simultaneously assigning responsibility to those that have the power to reduce the vulnerability of these animals in the first place.[79]

This paper does not intend to tell the stories of those farmed animals who remain captive in the capitalist agri-food system; rather, we talk about more expanded and emancipatory experiences of farmed animals past the farm gate in the peripheries of areas zoned for agriculture.[80] We will explore the immediate impacts experienced by sanctuaries during extreme weather events (the quick violence) and some of the secondary impacts (the slow violence, or undoing), including having to reimagine what solidarity looks like between the sanctuary movement and farmed animals seeking refuge during the climate crisis.

4.2 Sanctuaries and the Climate Crisis: The Quick Violence

As sanctuaries are predominantly found in agricultural zones, and agricultural zoning areas are more often than not built-in vulnerable geographies such as flood plains, this indexes a major hazard for sanctuaries. Looking back to the 2019 Australian bushfires, Danielle Celermajer writes that despite having the most informed and thought-out contingency plans, including having consulted local disaster authorities, the wildfires managed to ravage her sanctuary. Not only did the wildfires leave her sanctuary unrecognizable, but they transformed how she conceptualized the possibilities for freedom and safety at farmed animal sanctuaries in the Anthropocene.

In *Summertime: Reflections on a Vanishing Future*, Celermajer opens with the moving story of Jimmy and Katy, two rescued pigs who were transformed by the 2019 Australian bushfires.[81] Of the over one billion animals that were said to have died during the wildfires, Celermajer tells the story of one of those casualties.[82] Katy was engulfed and killed by the flames, and Jimmy was engulfed in grief and trauma from being surrounded by the same flames that claimed his companion Katy's life. In preparing for the fires, Celermajer and her partner evacuated many of the sanctuary residents, relocating them to temporary places of refuge - this time from the elements of the extreme weather. Despite this effort, there is no guarantee of safety, as she writes "the very idea of being safe…is one of the main casualties of the climate catastrophe."[83]

Celermajer directs readers' attention to the challenges of operationalizing temporary capture and relocation for sanctuary residents during extreme weather events. She states that not only were they lacking access to disaster equipment such as

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[77] Barbara, J. King, "As Florence kills pigs and millions of chickens, we must 'open our hearts," (NPR, 24 September, 2018) <https://www.npr.org/sections/thesalt/2018/09/24/650437498/opinion-as-florence-kills-pigs-and-millions-of-chickens-we-must-open-our-hearts> accessed 10 December 2022.
[78] James Sawyer and Gerardo Huertas. *Animal management and welfare in natural disasters*. Routledge, 2018, 2.
[79] King, 'As Florence kills pigs and millions of chickens, we must 'open our hearts'.
[80] Emmerman, Karen S. "Sanctuary, not remedy." *The ethics of captivity* (2014): 213-230.
[81] Celermajer, *Summertime: Reflections on a Vanishing Future*.
[82] The University of Sydney, 'More than one billion animals killed in Australian bushfires' (*The University of Sydney*, 8 January 2020) <'https://www.sydney.edu.au/news-opinion/news/2020/01/08/australian-bushfires-more-than-one-billion-animals-impacted.html> accessed 10 December 2022.
[83] Celermajer, *Summertime: Reflections on a Vanishing Future*, 179.

hauling trucks to relocate animal residents, but being a sanctuary, they struggled to recapture residents. At sanctuaries, human caregivers relate and approach residents in ways that enable animal agency, including the ability to evade capture. By not training the animal residents at the sanctuary, they are allowed to "move across the land according to their own rhythms, respecting their approach to approach or withdraw."[84] Sanctuaries aim to promote rather than discourage animal agency, unlike in agricultural production; however, this relationality can become an obstacle during disaster events.[85] During the bushfires, Celermajer's efforts to recapture the resistant donkeys resulted in what she describes as their loss of trust in her, a type of situation that compels us to "rethink freedom" in spaces of sanctuary.[86]

Celermajer's text offers both general readers and the sanctuary movement a brutally honest, and at times uncomfortable chronicle of what one sanctuary experienced when the fires swept across the land, consistent with an expanding literature dedicated to archiving and documenting the experiences of animals and disasters.[87] As sanctuaries face extreme weather events, caregivers are forced to grapple with mitigating and responding to death, largely dictated by a lack of resources and the unpredictability of extreme weather events, which also force sanctuaries to grapple with issues surrounding the intake of animals and solidarity with animal victims and survivors during these disasters.

4.3 Intake

At its core, farmed animal sanctuaries are spaces where life-long care and protection is provided to previously farmed animals in a permanent "physical refuge."[88] Farmed animal sanctuaries vary in whom they provide refuge to, but most often sanctuaries tend to be multispecies in that there are a range of species-representation across residents. This tends to be strategic in that sanctuaries want to have farmed animal species as ambassadors to advance their public educational component.[89] An obvious, but underappreciated limitation of a sanctuary is that they can only provide forever-homes to an "infinitesimally tiny percentage of the billions of animals raised and killed annually."[90] Due to limitations in capacities, sanctuaries tend to negotiate intake. This can look like responding to requests from legal owners who want to 'donate' or 'retire' farmed animals that have pulled on their heartstrings. Or, it can look like conversations with animal liberators who are planning an open or clandestine rescue. By controlling intake this way, sanctuaries can match their capacity and resources for care with how many residents live at the sanctuary.

However, sanctuaries can also become populated through animal-directed liberation, such as when animals escape slaughterhouses, or free each other.[91] Before farm sanctuaries, animals liberated through animal-directed liberation were rarely able to experience their new-found freedom permanently. Rather, their property

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[84] Celermajer, *Summertime: Reflections on a Vanishing Future*, 31.
[85] Charlotte E. Blattner, Sue Donaldson, and Ryan Wilcox, "Animal agency in community," *Politics and Animals,* 6 (2020): 1-22.
[86] Celermajer, *Summertime: Reflections on a Vanishing Future*, 7.
[87] Leslie Irvine, *Filling the Ark Animal Welfare in Disasters*, (Philadelphia: Temple University Press, 2009).; Annie Potts and Donelle Gadenne, *Animals in emergencies: learning from the Christchurch earthquakes*, (Canterbury University Press, 2014).
[88] Donaldson and Kymlicka, "Farmed animal sanctuaries: The heart of the movement," 51.
[89] Donaldson, and Kymlicka, "Farmed animal sanctuaries: The heart of the movement."
[90] Donaldson, and Kymlicka, "Farmed animal sanctuaries: The heart of the movement," 52.
[91] Sarat Colling, *Animal resistance in the global capitalist era*, (MSU Press, 2020).

status would be reinscribed when authorities force the escapees back into production or kill them on-the spot upon recapture. However, dating back to 1986 with the opening of Farm Sanctuary in Watkins Glen, New York, sanctuaries have been serving as interlocutors in renegotiating animals' fate with owners and authorities in instances of animal-directed liberation.[92]

Another ever-increasing route of liberation is during extreme weather events when animals are released intentionally by the producers, are flushed out of barns, or liberate themselves.[93] Important to be cognizant is that not all farmed animals are equally releasable, flushable, or possess the same degree of agency during extreme weather events. For instance, animals such as dairy cows that remain tethered or chained by their necks to a metal rod, or caged like sows in gestation crates, have little to no chance of exercising agency for escape.[94] Opening a pen full of free-range animals is easier than individually releasing animals. Being aware of the differential vulnerabilities animals face is important as it directly shapes who will find themselves on the outside of the agricultural production facility.

4.4 Acting in Solidarity to Farmed Animals during Extreme Weather Events

During extreme weather events that impact agricultural regions, the media becomes saturated by reports of farmed animals who died or were re-captured through valiant efforts of agricultural-embedded rescue workers.[95] These stories are elevated for two primary reasons: (1) to publicly communicate what rescue efforts were made to mitigate animal welfare issues and; (2) to solicit public acceptance for publicly subsidized government disaster relief. Within this framing, farmed animals are presented as either dying from the extreme weather event or are re-captured (or "rescued") to re-enter agricultural production.[96]

However, there remains a third possibility that does not get broadcast as it threatens the first framing. This alternative captures the stories of farmed animals leaving the logic of production entirely.[97] Farmed animals can leave production through either being captured and introduced to a farmed animal sanctuary through this emerging intake pathway or they can defy capture all together and join feral communities.[98]

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[92] Colling, *Animal resistance in the global capitalist era*.
[93] However, this is becoming increasingly rare because producers/farmers are instructed not to because of the risk of introducing secondary disasters (e.g., domesticated hogs joining feral hog populations), or because disaster relief including insurance de-incentivizes animal release.
[94] Elisabeth A. Stoddard and Alida Cantor, "A relational network vulnerability assessment of the North Carolina Hog Industry," *Annals of the American Association of Geographers* 107, no. 3 (2017): 682-699.
[95] Danielle Every, Clemence Due, Kirrilly Thompson, and Jillian Ryan, "Conflicting perspectives on nonhuman animal rescues in natural disasters," *Society & Animals* 24, no. 4 (2016): 358-382.
[96] Stories of reunification portray a false narrative. Farmed animals re-captured are more likely to be euthanized due to exposure to toxic floodwaters, or flames deeming them contaminated or decreasing their productivity. For example, during the Australian bushfires burnt livestock were euthanized (see Brendan David Cowled, Melanie Bannister-Tyrrell, Mark Doyle, Henry Clutterbuck, Jeff Cave, Alison Hillman, Karren M. Plain, Caitlin Nicole Pfeiffer, Michael Laurence, and Michael Ward, "The Australian 2019/2020 black summer bushfires: analysis of the pathology, treatment strategies and decision making about burnt livestock," *Frontiers in veterinary science* (2022): 83.
[97] Eccles and Stoddard, "Troubling the Legal Standing of Farmed Animals During a Disaster".
[98] Colling, *Animal resistance in the global capitalist era*.

These particular stories of farmed animals' route to sanctuary are controversial because they directly challenge ideas about farmed animals' subjectivity. Farmed animals are typically presented as "limited beings whose lives unfold according to fixed genetic or species-specific scripts," casting them as dependent on human care and infrastructure.[99] However, stories that circulate following a disaster event showcase how farmed animals' can adapt to novel environments, such as domestic pigs becoming rewilded by joining feral communities. Having stories populate the media that document farmed animals acting both individually and collectively to navigate and survive novel environments outside of the controlled and confinement agricultural facilities reveals their subjectivity and shows what agency can look like unrestrained.

These counter-narratives can cultivate public sympathy by directly confronting the public about the "dysfunction in our legally constructed relationships with animals" that made them vulnerable in the first place, and what legal and economic incentives led to a lack of rescue interventions.[100] The threat that animal agriculture industries sense in such stories regarding the post-production lives of animals is that it enables "a statistic to [become] an individual in the view of the public."[101] Animals that are re-captured and introduced into sanctuary spaces generate powerful stories that challenge our institutionalized relations with farmed animals, and shed light not just on post- but also pre-disaster lives.

Crucial to these rescue stories and counter-narratives is the presence of humans mobilizing and acting in solidarity with farmed animals during a disaster event. In some circles, these individuals would be called animal rights, or liberation advocates, whereas in more institutional spaces they are recognized as "spontaneous uninvited volunteers" (SUVs).[102] What makes SUVs "uninvited" according to disaster management literature is that they can cause "harm" to themselves (e.g., exposing themselves to dangerous situations), animals (e.g., improper handling), and agricultural communities (e.g., disaster rustling).[103]

Mitigating the third harm is ranked as the most important because following an agricultural disaster, the most important goal is to return producers to production as fast as possible. Meeting this objective can be delayed if counter-documentation of the disaster circulates in the media engendering questions from the public about production in general, leading to criticisms of the systems that produce the vulnerability in the first place.[104] This becomes a public relations nightmare for the agricultural community, corporations, and the different levels of government involved. In addition to efforts to control the framing of the disaster that reveal the vulnerability of farmed animals as created by production systems, SUVs challenge the definition of

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[99] Blattner et al., "Animal agency in community," 1.

[100] Ashleigh P.A. Best, "Material vulnerabilities and interspecies relationalities: a critical appraisal of the legal status of animals in disasters," *Griffith Law Review* 31, no. 2 (2022): 287-311, 288. During disaster events, even if contracted-farmers want to attempt at rescue-efforts they can face directives from insurance, or the companies who own the animals to keep the barn door closed as it is considered more cost-effective, and environmentally friendly, disregarding the sentience of these animals.

[101] Best, "Material vulnerabilities and interspecies relationalities: a critical appraisal of the legal status of animals in disasters."

[102] Dick Green, *Animals in disasters*, (Butterworth-Heinemann, 2019), 108.

[103] Steve Glassey, "Do no harm: A challenging conversation about how we prepare and respond to animal disasters," *Australian Journal of Emergency Management* 36, no. 3 (2021): 44-48.; Steve Glassey, "Animal Welfare and Disasters," In *Oxford Research Encyclopedia of Politics*, (2020), n.p.

[104] Irvine, *Filling the ark: animal welfare in disasters*.

rescue during disasters by offering an alternative to rescuing and returning farmed animals to production.

Following the 2008 Iowa floods, Farm Sanctuary, alongside other animal rescue organizations mobilized and deployed teams of rescue-workers to embark on "one of the most ambitious farm animal rescue efforts ever undertaken."[105] Together, the rescue teams were able to re-capture 69 pigs, several of whom were pregnant. Between these rescues, the teams were also having to make difficult decisions to euthanize survivors who were "beyond aid." Susie Coston, the National Shelter Director of Farm Sanctuary at the time commented that, "without the floods they wouldn't be here, which is kind of creep and scary that that kind of tragedy could actually make their lives betters." During the 2008 rescue, Farm Sanctuary and the other organizations were seen as less 'uninvited,' and more welcomed because they were able to contribute to the disaster response during an animal welfare disaster. However, over the past decade, with more frequent extreme weather events, and the industry and government working in tandem to control the narrative of what happens before, during, and after an agricultural disaster, rescue-workers such as those that came with Farm Sanctuary are categorized as SUVs and actively de-mobilized on the ground through police blockades or through fear of being subject to various ag-gag laws.

Despite the obstacles that have been erected for the sanctuary movement to respond to disaster events, SUVs still show up because they know with medical intervention tending to both pre- and post-disaster health issues, chickens, turkeys, cows, and pigs can find their way to sanctuary and thrive.

One recent example took place in North Carolina, one of the top-ranked agricultural-producing states in the United States. North Carolina captured the media's attention during Hurricane Florence in 2018 as millions of farmed animals who were once contained in industrial-scaled facilities were now floating dead or nearly-dead in the contaminated floodwaters. Almost two decades earlier in 1999, the media reported a remarkably similar situation following Hurricane Floyd, where the public demanded government and industry to develop disaster management plans for farmed animals after seeing how animals were institutionally abandoned. Despite almost two decades of developing disaster management for farmed animals, reviewing the coverage following Florence in 2018, it was almost a copy-paste animal welfare crisis of what happened in 1999.

What differs between Hurricane Floyd and Florence is who responded to rescue, what rescue efforts looked like on the ground, and how this information was circulated. Following Florence, international media presented an entirely different response to farmed animals in disasters. Within the stories that emerged post-Florence are courageous accounts of SUVs or specifically people involved in the sanctuary movement who were able to show up, document, intervene and extend refuge to nearly a thousand farmed animals that had been released by anthropogenic or other means.[106]

Flo, a pig whose lungs were filled with water after surviving Hurricane Florence, was found on Josh Wall's property. Instead of calling the authorities, Wall contacted Ziggy's Rescue Farm Sanctuary. Flo was later joined by pigs Jox, Champ, and Barney,

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[105] Farm Sanctuary, 'Midwest flood rescue: Ambitious operation saves 69 pigs," (*Farm Sanctuary*, 9 September 2008) <https://www.farmsanctuary.org/news-stories/midwest-flood-rescue-ambitious-operation-saves-69-pigs/> accessed 10 December 2022.

[106] Stephanie Eccles and Stoddard, Lisa, "Hurricane Florence's impact: Policies on animals living in confined animal feeding operations in Eastern North Carolina," *World Animal Protection Report*, 2021.

whose experiences were told in the short documentary called Hurricane Hero's produced by Mercy for Animals.[107] There was Red, a cow, rescued by Skylands Animal Sanctuary and Rescue, who upon arrival at the sanctuary, met Hurricane Harvey survivor, Babe and have since been bonded.[108] There were at least 75 broiler chickens rescued by Sweet Bear Rescue.[109] There was the heartbreaking story shared by WeAnimals of the almost rescue of ten-pigs.[110] And then there was Erika Lovato, living in Jacksonville, North Carolina whose rental property became a "physical space of (limited) protection" for pigs who were fleeing production floodwaters, and residents who saw the pigs as target practice.[111] In an attempt to provide temporary refuge for these pigs, Lovato built a temporary structure in her backyard for the over 43 pigs that she rescued, and eventually relocated most of them to other sanctuaries in the months following Hurricane Florence. Shortly after, Lovato and her family purchased property in the middle of 'hog county,' a place where pigs outnumber humans 30:1, opening Out of the Woods, a homage to the survivors, and eventually renaming the site to Sisu Refuge, a multispecies sanctuary whose origin story is traced to the Hurricane Florence survivors.

These examples come from one extreme weather disaster, but they represent an emerging route for farmed animals to resist, escape, defy capture or seek refuge in sanctuaries, putting new demands on the sanctuary movement.[112] As farmed animals are flooded out, released, or escape confinement during extreme weather events, an emerging and perhaps higher than manageable demand of internally displaced "seekers" are looking for refuge.[113] We want to emphasize this challenge in our article because we see a lack of attention and engagement on this significant problem the sanctuary movement will increasingly face. In the following section, we will look at how extreme weather events are prompts to rethink what solidarity means, this time in instances where refuge is denied.

4.5 Rethinking Solidarity at a Sanctuary During Extreme Weather Events

Within the disaster literature, disasters are said to be "focusing events" in that they bring to the fore key lessons about how to build back better, such as by highlighting what makes animals vulnerable in the first place and what is to be done to address identified hazards.[114] As extreme weather events increase in their frequency and

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[107] Mercy for Animals, "Hurricane Heros," November 18, 2018, YouTube, 10:10, https://www.youtube.com/watch?v=JroUIFqyKNE.

[108] Elizabeth Claire Alberts, 'Pig Who Swam for his Life During Hurricane Florence Shows up in a guy's yard--and changes his life' (*The Dodo*, 2018, 21) <https://www.thedodo.com/on-the-farm/farm-pig-rescued-hurricaneflorence> accessed 10 December 2022.

[109] Ashley Capps, 'Meet Farmed Animals Rescued from Florence Floods' (*A Well-Fed World*, 2018) <https://awellfedworld.org/issues/florence-survivors/> accessed 10 December 2022.

[110] Guerin, Kelly, 'Documenting the aftermath for animals of Hurricane Florence' (*WeAnimals*, 13 September 2018) <https://weanimalsmedia.org/2018/10/13/hurricane-florence/> accessed 10 December 2022.

[111] Sisu Refuge, 'Starting the sanctuary' (*Sisu Refuge*, 2018) <https://sisurefuge.org/starting-the-sanctuary/> accessed 10 December 2022.; Abrell, Elan. "Sanctuary-making as rural political action." *Journal for the Anthropology of North America* 22, no. 2 (2019): 109-111, 109.

[112] Colling, *Animal resistance in the global capitalist era*.

[113] Pachirat, "Sanctuary," 338.

[114] Greg Bankoff, "Learning about disasters from animals," In *Learning and Calamities*, (Routledge, 2014), pp. 62-75, 63.; James Sawyer and Gerardo Huertas, *Animal management and welfare in natural disasters*, (Routledge, 2018).

intensity, the limitations of the sanctuary's capacities to provide refuge will be brought into sharp relief, becoming a key question for the sanctuary movement. Abrell writes, "just as resources and space are limited within sanctuaries, sanctuaries as a collective resource for rescuing animals are even more limited."[115] Sharing this view, Leslie Irvine argues that "the 'solution' to disasters involving farmed animals does not involve rescuing as many as possible, although some rescue will occasionally have to take place....It involves curtailing and eventually ending the perverse industrial farming practices that make animals so vulnerable."[116] Acknowledging the extraordinary position the sanctuary movement is in when it comes to providing refuge to farmed animals during the climate crisis, we turn to recent examples highlighting some decisions sanctuaries are forced to make, which necessitate a rethinking of what it means to be in solidarity with farmed animals, or recognition of the limitations of solidarity during climate crisis catastrophes.

Identified earlier in this article is the problem of the sanctuary's dependence on agricultural supply-chains. During the 2021 Abbotsford floods in British Columbia that claimed the lives of over 600,000 farmed animals, which occurred simultaneously during outbreaks of HPAI, the handful of sanctuaries in the area were not able to meet the demand and intake farmed animals who were released, flushed out, or escaped. The sanctuaries in the surrounding region could not intake birds because of the "no birds in, no birds out" policy. Not only this, but the sanctuaries were facing supply-chain issues due to the floodwaters, damaged infrastructure, and exceptional demands on an already constrained supply-chain of critical farmed animal supplies including hay, woodchips, and feed. The scarce resources that were available were redirected according to a triage system of agricultural production needs. The sanctuaries in the region reliant on the same supply-chains were prevented from accessing critical farmed animal supplies due to both shortages and inflation. Happy Herd Farm Sanctuary reported that the prices of hay jumped from $5 per bale to as much as $25 per bale, and unlike the agricultural producers, they were not able to access disaster relief that would subsidize post-disaster costs (e.g., the Livestock Relocation Policy). With these challenges that are certain to occur more frequently, the four sanctuaries in British Columbia made the difficult decision to stop intake because "with the future so uncertain, they dare not overburden themselves."[117] As a result, there were farmed animal escapees who were not given refuge because of the sanctuaries' self-imposed limitations.

Extreme weather events, despite all of the destruction and death, represent an emerging route to freedom for farmed animals as highlighted in the case of the Iowa floods and Hurricane Florence. The question remains how humans committed to animal liberation, or the SUVs, "strategically mobilize" to respond to this crisis?[118] How can sanctuaries respond to the growing demand on them to provide refuge for the animals who are both climate crisis survivors and animal industrial complex escapees? How might these challenges change our conceptualization of sanctuaries? And of course, how will existing sanctuaries prepare and respond to the extreme weather events when they arrive? Sanctuaries will continue to face the day-to-day challenges that come with the already substantial tasks of caring for previously farmed

[115] Abrell, *Saving animals: Multispecies ecologies of rescue and care*, 191.
[116] Irvine, *Filling the ark: animal welfare in disasters*, 54.
[117] Nicholas Read, "How 2021's climate catastrophes are still hurting B.C. farm animal sanctuaries," (*Vancouver Sun*, 6 April 2022) <https://vancouversun.com/news/local-news/how-2021s-climate-catastrophes-are-still-hurting-b-c-farm-animal-sanctuaries> accessed 10 December 2022.
[118] Colling, *Animal resistance in the global capitalist era*, 126.

animals, and the extraordinary challenges will become 'extra-ordinary,' bringing to the fore exponential levels of difficulties to these multispecies worldbuilding projects.[119]

5 Conclusion: Towards Multispecies Justice and Institutional Change Beyond the Sanctuary-Gate

In previous sections, we have argued that the domination of animals under a biopolitical human sovereignty is the foundation from which inescapable crises arise. These crises include zoonotic diseases and extreme weather events, which sanctuaries can never fully shield themselves from. While the examples we highlighted demonstrate numerous ways sanctuaries have responded to these disasters to the best of their capacities, whether through various rescue efforts, quarantine protocols, temporary relocations, and adjusting animal intake numbers, the examples also expose the severe limitations of these reactive measures. In light of our analysis, we agree with Jeff Sebo's argument that "we need to reduce our use of animals as part of our pandemic and climate change mitigation efforts" as we "increase our support for animals as part of our pandemic and climate change adaptation efforts."[120] However, institutional changes and transformations at the level of industrial production are necessary in order to effectively enact and achieve the aims of these mitigation and adaptation efforts. Furthermore, given that the animal advocacy movement broadly construed is much smaller relative to other social and ecological justice movements, both in terms of membership and resources, and that single-issue advocacy messaging tends not to resonate as widely with the broader public or particular movements and communities experiencing similar concerns, we propose multispecies justice as a guiding framework for how animal sanctuaries and the animal advocacy movement generally might proceed.

As an emerging field of study and a theoretical approach, multispecies justice expands our conception of which entities, both living and nonliving, fall within our moral, ethical, and political considerability, and qualify as subjects of justice. Some scholars who have mapped out the research terrain and theoretical traditions trace the development of multispecies justice to decolonial and anticolonial theories, Indigenous philosophies, posthumanism, political ecology and environmental justice, as well as animal rights.[121] As such, multispecies justice holistically recognizes that violent institutions and destructive forces in the world often harmfully impact a large number of different species at once, while attempting to theorize strategies that could respond to these harms. Under this framework disasters are not seen as "a natural disaster or tragedy, but injustice."[122] Below, we go over some existing examples of approaches to animal sanctuary work that we believe either already embody the values

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[119] Gretchen Sneegas, "Producing (extra) ordinary death on the farm: unruly encounters and contaminated calves," *Social & Cultural Geography* 23, no. 1 (2022): 63-82.
[120] Jeff Sebo, *Saving Animals, Saving Ourselves: Why Animals Matter for Pandemics, Climate Change, and Other Catastrophes,* (Oxford University Press, 2022), 197.
[121] Danielle Celermajer, David Schlosberg, Lauren Rickards, Makere Stewart-Harawira, Mathias Thaler, Petra Tschakert, Blanche Verlie, and Christine Winter. "Multispecies Justice: Theories, Challenges, and a Research Agenda for Environmental Politics." *Environmental Politics* 30, no. 1-2 (2021): 119–40.; Petra Tschakert, David Schlosberg, Danielle Celermajer, Lauren Rickards, Christine Winter, Mathias Thaler, Makere Stewart-Harawira, and Blanche Verlie. "Multispecies justice: Climate-just futures with, for and beyond humans." *Wiley Interdisciplinary Reviews: Climate Change* 12, no. 2 (2021): e699.
[122] Celermajer, Schlosberg, Rickards, Stewart-Harawira, Thaler, Tschakert, Verlie, and Winter, "Multispecies Justice: Theories, Challenges, and a Research Agenda for Environmental Politics," 120.

of multispecies justice or are moving towards that end to correct the larger systems, such as capitalist industrial animal agriculture that generate the injustices identified in this article.

In 2022, several farmed animal sanctuaries in the United States hosted events that exemplify how sanctuaries could embrace more critical and holistic approaches to their work. "The Reimagining Sanctuary Conference," co-hosted by VINE Sanctuary, Indraloka Animal Sanctuary, and the Global Coalition of Farm Sanctuaries invited members of farmed animal sanctuaries from around the world to participate in reflecting on four main topics: (1) ethical conduct for farmed animal sanctuaries towards their own human and nonhuman members, (2) how to build supportive communities, (3) intersectionality with other social and ecological justice movements, and (4) reimagining what animal sanctuaries could do and be.[123] The discussions encouraged and empowered members of the farmed animal sanctuary movement, whether founders, staff, volunteers, or supporters, to think beyond the traditional educational and animal rescue and rehabilitation work that sanctuaries conduct, to work towards building a stronger network together, form connections with communities beyond the movement, and engage with other anti-oppression struggles.

Similarly, the 2022 Rancher Advocacy Program (RAP) Summit co-hosted by Renee King-Sonen, founder of Rowdy Girl Sanctuary and RAP, was entitled "Evolving Beyond Animal Ag."[124] Featured speakers at the summit included farmers who have been transitioning away from animal farming to mushroom farming, and Connie Spence, founder of Agriculture Fairness Alliance, an organization aimed at lobbying federal legislators to shift the food system towards a plant-based economy, as well as Eloisa Trinidad, the Execute Director of Chilis on Wheels, focusing on "making veganism accessible to communities in need through food relief, policy, education, and mentorship."[125] Such efforts are aligned with the political messaging of the need for a "just transition in agriculture" that considers the importance of labor issues in these transitions.[126] By offering a platform to such speakers, Rowdy Girl Sanctuary and King-Sonen demonstrate how sanctuaries could be engaged in more expansive advocacy efforts targeting transformations at institutional scales. RAP is a dedicated program operated through the support of Rowdy Girl Sanctuary, which seeks to help ranchers transition to a range of alternatives, such as sanctuary, plant-based farm, renewable energy farm, veganic agriculture, and rewilding scenarios, among other possibilities.[127] And given that the creation of Rowdy Girl Sanctuary is itself a ranch-to-sanctuary story, such transformative ideals are embodied throughout their work.[128]

Similarly, joining in the trend of re-imagining and working to transform our food system, sanctuaries are putting forward alternative food systems operated within the traditional sanctuary space. Sweet Farm Sanctuary is self-described as the "first

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[123] VINE Sanctuary, "Reimagining Sanctuary Conference," (*Vine Sanctuary*, 2022) <https://vinesanctuary.org/2022conference> accessed 10 December 2022.
[124] Rancher Advocacy Program, "RAP Summit 2022: Evolving Beyond Animal Ag," (*Rancher Advocacy*, 2020) <https://rancheradvocacy.org/wp-content/uploads/2022/07/RAP-Summit-Program-July-2022.pdf> accessed 10 December 2022.
[125] Rancher Advocacy Program, "RAP Summit 2022: Evolving Beyond Animal Ag."
[126] Charlotte E. Blattner, "Just transition for agriculture? A critical step in tackling climate change," *Journal of Agriculture, Food Systems, and Community Development* 9, no. 3 (2020): 53-58, 54.
[127] Rancher Advocacy Program, "Transitional Models," (*Rancher Advocacy*, n.d.) <https://rancheradvocacy.org/transition-models/> accessed 10 December 2022.
[128] Rowdy Girl Sanctuary, "The Rowdy Girl Story," (*Rancher Advocacy*, n.d.) <https://rowdygirlsanctuary.org/rowdygirl-story/> accessed 10 December 2022.

non-profit sanctuary to address global climate change impacts of factory farming."[129] Founded by Nate Salpeter, a nuclear and climate technology engineer, the sanctuary objectives leverage his expertise and connections to operate what he calls the first "climate sanctuary."[130] Sweet Farm Sanctuary tackles the injustices of industrial animal agriculture by working in multiple areas including climate education, regenerative agriculture, farmed animal rescue, and supporting innovation and technology that can disrupt the current food system through providing an incubation hub to start-ups and produce alternative, viable systems. Sweet Farm Sanctuary's ambitious efforts and commitments to seeking justice through technological innovation of the food system are motivated by reconciling with the fact that research has demonstrated 84% of individuals who adopt a plant-based diet do so only temporarily. Sweet Farm Sanctuary's support of cellular agriculture broaches a tension between sanctuaries' "opposition to animal exploitation and commodification" as cellular-based agriculture requires "donor animals," at least for now.[131] Perhaps, sanctuaries like Sweet Farm Sanctuary will develop into the temporary food production model proposed by Jan Dutkiewicz and Elan Abrell, who envision cell donor animals living in sanctuary spaces.

Other sanctuaries such as Sho Farm and Sanctuary in western Vermont are taking a less technologically innovative approach to re-imagining and building alternative models of food systems. By operating around the natural, routine behaviors of sanctuary residents (mostly ducks) and enlisting them as "farm partners" who tend to pests, and fertilize the grounds, Sho Farm and Sanctuary is at the front lines of a burgeoning veganic food production method that puts just, respectful, and mutually beneficial multispecies collaborations into practice.[132]

This paper is an attempt to bring to the forefront a category of animals called sanctuary residents, distinct in that they are surrounded both discursively and materially by commitments to protection, to see that they grow old in what are called farmed animal sanctuaries. We consider how sanctuary residents and the broader ethical and political projects they are a part of are being slowly, and at times rapidly, foreclosed by the conditions of the Anthropocene, and specifically by the institutions that respond and manage disasters. The conditions of the Anthropocene, such as the biological and ecological disasters we have focused on, could be traced to the animal industrial complex, upheld, and sustained by the reproduction of human sovereignty. By examining how human sovereignty remains buttressed by legal and economic systems through examples of sanctuaries experiencing biological and ecological disasters, we draw attention to how the sanctuary movement and its larger political projects are threatened.

By bringing these unfolding crises into conversation with multispecies justice, we consider the necessity for sanctuaries to take up the labor and responsibility of participating in broader struggles for institutional change. Through a multispecies

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[129] Sweet Farm, "Creating a new kind of sanctuary," (*Sweet Farm*, n.d.) <https://www.sweetfarm.org/> accessed 10 December 2022.

[130] Spark and Foster Films, "James Stewart and Nate Salpeter at Cultured Meat Symposium 2021," YouTube, December 28, 2012 <https://www.youtube.com/watch?v=wZuy9uEnBoY> accessed 10 December 2022.

[131] Jan Dutkiewicz and Elan Abrell, "Sanctuary to Table Dining: Cellular Agriculture and the Ethics of Cell Donor Animals," *Politics and Animals* 7 (2020): 1-15.

[132] Jessica Scott-Reid, "Are sanctuary farms a solution to our broken food system?" (*Planet Friendly News*, 2 March 2022) <https://www.planetfriendlynews.com/blog/are-sanctuary-farms-a-solution-to-our-broken-food-system?fbclid=IwAR0zXnv4U5A8gAwkaBG5Q20M1VAyDW71sjkksiDIVgEHDNfd1QMaOq_edXo> accessed 10 December 2022. See: https://www.sanctuaryatsho.org/

justice framework, we suggest that disaster events represent key opportunities for sanctuaries to look beyond the sanctuary-gate and engage with the political project of ending animal production at all scales to ensure a safer future for humans and more-than-human alike.

Climate Change and Wild Animals: Key Ethical Perspectives

Clare Palmer

Abstract: Climate change is already having significant impacts on wild animal species and individuals. While not all these impacts are negative, many individual animals will suffer declines in their welfare and some will die, and many species will move towards extinction, as the climate changes. From a number of ethical perspectives, these negative impacts of climate change matter. This paper will outline three such perspectives: those that emphasize the value of *species*, those that are primarily concerned with individual animals' *welfare*, and those that focus on climate *injustice*. Each of these perspectives appears to require an ethically-informed policy response to negative climate impacts on wild animals. However, I'll suggest, such different ethical perspectives don't always agree on what the best practical response actually is. This may make it more difficult to construct ethical policy and legal frameworks to respond to climate change in the context of wild animals.

Keywords: Climate change, ethics, wild animals, species, animal welfare, justice.

1 Introduction

Climate change is already having major impacts on wild animals, changing the ecosystems in which they live, and creating new challenges, as well as in some cases, new opportunities, for the animals concerned.[1] [2] These impacts, I will maintain, are of *ethical* importance from almost all perspectives in environmental and animal ethics. In this paper, I'll outline three rather different ethical positions – one based around the value of wild animal species, a second around wild animal welfare, and the third around justice to wild animals, and argue that climate change is ethically problematic from all three positions.[3] Given this, some kind of policy response appears to be needed ethically, either with the goal of reducing or eliminating the wrong, or attempting to repair or compensate for it. However, because these three ethical approaches understand the ethical problem differently, they do not always agree on what kinds of strategies should be adopted. This creates difficulties in clearly

[1] Camille Parmesan, 'Ecological and evolutionary responses to recent climate change' (2006) 37 Annual Review of Evolution, Ecology and Systematics 637.

[2] Wendy B. Foden, Bruce E. Young, H. Resit Akçakaya, Raquel A. Garcia, Ary A. Hoffmann, Bruce A. Stein, Chris D. Thomas, Christopher J. Wheatley, David Bickford, Jamie A. Carr, David G. Hole, Tara G. Martin, Michela Pacifici, James W. Pearce-Higgins, Philip J. Platts, Piero Visconti, James E. M. Watson, Brian Huntley, 'Climate change vulnerability assessment of species' (2019) 10 Wiley Interdisciplinary Reviews: Climate Change, e551.

[3] These three accounts are not intended to be comprehensive; there are also *biocentric* positions on which wild animals matter as individual living organisms, and *ecocentric* positions on which wild animals matter as ecosystem members. These are likely to produce even more divergence in policy terms, so would serve to reinforce the main point I'm making here.

articulating "ethical" climate policies, and perhaps legal frameworks, for responding to wild animals affected by climate change. However, as I will conclude by suggesting, there are at least some practical strategies that might be supported from several different ethical perspectives; such strategies may be an especially firm foundation for ethical policies and legal frameworks responding to wild animals threatened by climate change.

2 Wild Animals and Climate Change

In order to discuss the impact of climate change on wild animals, I should first say something about how I'm using these terms.

First, I'm taking *climate change* to refer to the long-term shifts in climate and typical weather patterns being brought about by human-originating emissions of various gases, in particular from the burning of fossil fuels such as coal, oil and gas. Importantly for the argument here, I'm taking climate change to be *anthropogenic*.

Second, *wild animals* is a particularly difficult term to define because it's used in so many different ways – for instance, to describe animals that are not tame, or alternatively not domesticated, or that are living in unmanaged locations, or that are free-living and relatively autonomous, or that are not dependent on human provision. While in some ethical discussions these distinctions are very important, for my purposes here, a fairly broad definition will suffice: I will be thinking about undomesticated, free-living animals; but these animals could be living in many different kinds of environments, and have a variety of different relationships with human beings.

The changing climate is affecting wild animal habitat, access to food and fresh water, and distribution of disease. It's intensifying extreme weather such as storms, heavy rainfall, heatwaves, and drought; melting glaciers, permafrost, and sea ice; and causing sea level rise.[4] Many, perhaps most, wild animals are living in significantly changing environments. What does this mean for the wild animals concerned?

Many of these changes are having negative impacts on wild animals, leading to local and global species extinctions and the suffering and death of individual animals. At species level, the first mammal species to have been driven to extinction by climate change appears to be the Bramble Cay melomys, which lived on coral keys in Eastern Australia; unusually high king tides seem to have drowned all remaining members.[5] Over time, 16 to 30% of species are predicted to be threatened with extinction due to climate change, unless there's a shift in climate policy.[6] Huge numbers of *individual* animals are also threatened by climate change. A billion animals, for instance, are thought to have died in Australia's intensified wildfires in 2020[7], while extreme flooding displaced millions of wild animals in Pakistan in 2022.

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[4] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability'. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf,S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA.

[5] Graham Fulton, 'The Bramble Cay melomys: the first mammalian extinction due to human-induced climate change' (2017) 23 Pacific Conservation Biology 1.

[6] Mark C. Urban, 'Accelerating extinction risk from climate change' (2015) 348 Science 571.

[7] The University of Sydney 2020 'More than one billion animals killed in Australian bushfires' [blogpost]. *The University of Sydney*, January 8. <https://sydney.edu.au/news-opinion/news/2020/01/08/australian-bushfires-more-than-one-billion-animals-impacted.html> accessed 15 November 2022.

Alongside these serious threats, climate change will also deprive some animals of positive welfare they might otherwise have had. For example, if population sizes reduce, animals may be deprived of preferred mate choices, or even of opportunities to mate altogether.

Having said all this, there's a need for some caution here; wild animals are not entirely without resources to respond to climate change. Specialist species with very particular niches and needs are more threatened than generalist species that can (for instance) shift their diet, thrive in different environments, and exhibit flexible behavior. Indeed, some species can be expected to thrive under climate change. Nine-banded armadillos, for instance, are marching north into states like Illinois from the south-eastern states of the US to which they were once confined.[8] And many species can adapt to a changing climate to at least some degree. Some are shifting their range towards the poles or higher altitudes where it's cooler, migrating earlier in the spring or later in autumn, or migrating shorter distances, to take advantage of earlier springs and warmer winters. Many wild animals are showing "behavioral plasticity" – that is, changing how they behave in response to a changing environment – for instance by foraging at different times of day, or staying in the shade.[9] And there's already evidence of evolution in response to climate change. Between 1989 and 2018, the body mass of North American birds declined by 0.6% on average, likely because being smaller helps keep birds cooler.[10] The Turks and Caicos Islands anole, a kind of lizard, has recently evolved stronger front toe pads and lighter back legs, allowing it to cling onto branches during intense hurricanes with its front feet, while its back feet fly loose in the wind.[11]

So, wild animals should not be seen wholly as victims of a changing climate. Nonetheless, climate change does threaten the existence, either globally or locally, of numerous species, and it potentially brings negative welfare impacts and death for many millions of animals. And even where wild animals are able to adapt to slower, more incremental changes, outbreaks of extreme weather, floods and intense wildfires are much more difficult to manage, leading to injury and death.

This conclusion is not new; it's in line with what most recent work in ecology and conservation has established, although here the emphasis has primarily been on species, populations, and biodiversity, rather than on animals as individuals. However, I now want to consider what this might mean in ethical terms.

3 Climate Change, Wild Animals and Ethics

The impacts of climate change on wild animals can be argued to matter ethically in a variety of ways. Here, I'll focus on just three different kinds of ethical concerns (these can reasonably be thought of as three of the most significant, though this account is very far from comprehensive). The first ethical concern is wild animal *species:* the

[8] Carly Haywood, Clayton K. Nielsen and F. Agustín Jiménez, 'Potential Distribution of Colonizing Nine-Banded Armadillos at Their Northern Range Edge' (2021) 13 Diversity 266.

[9] E.A. Beever, E. A., Hall, L. E., Varner, J., Loosen, A. E., Dunham, J. B., Gahl, M. K., & Lawler, J. J. 'Behavioral flexibility as a mechanism for coping with climate change' (2017) 15 Frontiers in Ecology and the Environment 299.

[10] Casey Youngflesh, James F. Saracco, Rodney B. Siegel and Morgan W. Tingley, 'Abiotic conditions shape spatial and temporal morphological variation in North American birds' (2022) 6 Nature, Ecology & Evolution 1860.

[11] Colin Donihue, Anthony Herrel, Anne-Claire Fabre, Ambika Kamath, Anthony J. Geneva, Thomas W. Schoener, Jason J. Kolbe, Jonathan B. Losos, 'Hurricane-induced selection on the morphology of an island lizard' (2018) 560 Nature 88.

possibility of the loss of whole species or at least whole populations to climate change. Both the second and the third ethical concerns are about *individual* wild animals. The second focuses on minimizing negative animal welfare impacts from climate change, a view which I'll call welfare-consequentialist; the third is concerned that climate change is an *injustice* to individual wild animals, in that humans are *causing* welfare loss and death. (Although I won't discuss this here, something like this third concern might be extended to species, depending on particular views about what kinds of things species are and why they matter). I will consider these three views in turn.

3.1 The Loss of Valuable Species

As I've pointed out, climate change threatens whole species, and even where species as a whole are not threatened, particular places or regions may lose entire populations. But why does this matter *ethically?* Of course, many species are important to humans: they may be directly useful for food, or fabric; they may be of cultural, historical, or aesthetic value, or they may provide other ecosystem services. However, what's of primary importance here are the many arguments that species have, in some sense, *intrinsic* value, or that they are *morally considerable,* independently of any concern about their usefulness or how they make us feel.[12] Such arguments have been proposed within conservation biology and by some environmental ethicists. For example, Michael Soulé, in his foundational paper "What is Conservation Biology?" maintained that "Species have value in themselves, a value neither conferred nor revocable, but springing from a species' long evolutionary heritage and potential or even from the mere fact of its existence."[13] Within environmental ethics, arguments for the intrinsic value of species take varied forms. J. Baird Callicott, for instance, argues that species have subjective intrinsic value – that is, that humans value species in themselves, independently of their usefulness;[14] while Holmes Rolston III maintains that we have duties to protect species as whole "forms of life" with *objective* value, that is, value independent of human valuation.[15] Most recently Ian Smith (2016) argues that a species can have interests and a good of its own, and that this good consists in reproducing successfully and remaining safe from extinction. As such, Smith argues, species have intrinsic value, and it would be virtuous of us to preserve that value – especially where we are the ones threatening it.[16]

While none of these arguments insist that species preservation should be prioritized over everything else, they all maintain that species extinction means the loss of intrinsic value. Other kinds of value are, of course, at stake here too, as I'm about to argue. But the value of wild animal species is a widely asserted ethical reason for concern about the impacts of climate change.

[12] Rick O'Neil, 'Intrinsic Value, Moral Standing and Species' (1997) 19 Environmental Ethics 44.
[13] Michael Soulé, 'What is Conservation Biology?' (1985) 35 Bioscience 727.
[14] J. Baird Callicott, 'The Intrinsic Value of Nonhuman Species' in Bryan Norton (ed) *The Preservation of Species: The Value of Biological Diversity*, (Princeton, N.J.: Princeton University Press, 1986), p. 160.
[15] Holmes Rolston III 'Duties to endangered species' (1985) 35 Bioscience 718.
[16] Ian Smith, *The Intrinsic Value of Endangered Species* (Routledge 2016).

3.2 Individual Sentient Animals

3.2.1 Animal Welfare

Before moving to consider welfare consequentialist and justice accounts, I should first say something about the term "animal welfare". The most prominent accounts of animal welfare interpret it in terms of *subjective experience*, maintaining that suffering is intrinsically bad, and happiness intrinsically good. Good welfare, whether human or non-human, is therefore measured in terms of positive experiences of pleasure and negative feelings of pain and suffering. (This is sometimes called a *hedonistic* account of welfare.)[17] Other accounts of welfare emphasize *desire-satisfaction*, the idea that good welfare should be measured in terms of the satisfaction of an animal's desires or preferences, and bad welfare in terms of the frustration of their desires. Yet other accounts measure welfare in terms of animals' freedoms to carry out *natural or species-specific behaviors*, independently of how animals actually feel, though such accounts are highly contested.[18] And some interpretations are pluralistic, adopting multiple different lenses on welfare.[19] Although climate change is likely to have negative impacts on the welfare of many animals understood in all these ways, a hedonistic account (for instance) might be concerned about somewhat different climate effects than a natural-behavior account. This is relevant for thinking both about welfare consequentialist and justice approaches.

3.2.2 Welfare Consequentialism

Welfare consequentialism is comprised by a group of views that aim to bring about the best consequences in terms of animals' welfare, however welfare is understood.[20] Inasmuch as climate change will negatively impact wild animal welfare (for instance, by increasing suffering or reducing happiness, frustrating basic desires, or preventing the performance of natural behaviors), it's seen as ethically problematic. Take, for example, one of the commonest views here, *hedonistic utilitarianism*, with its focus on minimizing suffering and maximizing pleasure. This implies an ethical obligation to intervene to improve the welfare of suffering animals, unless such intervention predictably risks making *overall* welfare worse. But it's worth pointing out, on this view, that such a duty to intervene applies to *all* wild animal suffering, not just that caused by anthropogenic climate change. The fact that suffering is caused by people doesn't give it any special moral force; what matters is not where the suffering comes from, but how severe it is and how tractable it is. Suffering that's very severe and tractable should be tackled first. So, on this view, if wild-animal suffering from climate change is very severe, we can do something effective about it, and what we do isn't likely to create more future suffering or to substantially reduce pleasures, we have a moral responsibility to try to relieve it. And while I've focused on suffering here, similar arguments can be made were welfare to be understood in terms of desire-frustration or constraints on performing natural behaviors. If climate change is

[17] Roger Crisp, 'Well-Being' in Edward N. Zalta (ed), *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition) <https://plato.stanford.edu/archives/win2021/entries/well-being/> accessed 15 November 2022.

[18] See, for instance, Heather Browning, 'The Natural Behaviour Debate: Two Conceptions of Welfare' (2020) 23 Journal of Applied Animal Welfare Science 325.

[19] Walter Veit and Heather Browning 'Perspectival pluralism for animal welfare' (2021) 11 European Journal for Philosophy of Science.

[20] There are some views that aim to "satisfice" rather than bring about the best consequences, but I'll put these on one side for now.

causing extreme desire frustration in wild animals (for instance, they strongly desire to drink, but no water is available) then other things being equal we should try to relieve it; likewise, if climate change is preventing the performance of natural behaviors – for instance, foraging in the sun, or swimming – then it is morally problematic.

3.2.3 Approaches Based on Justice

Another group of ethicists argue that *anthropogenic* impacts on welfare, including wild-animal suffering from climate change, should be understood differently from poor welfare *not* caused by humans, for instance, the suffering caused by predation.[21] Human beings are, on this view, *morally responsible* for climate change because – to adopt an argument from Nolt, (2011) – they can cause or prevent the harm; they can recognize it as morally significant; they can anticipate the harm reliably and they are not forced to behave in this way; there are alternative, less harmful possibilities.[22] What's more, climate change might be seen as a particularly unfair situation, because the benefits from burning fossil fuels all accrue to human beings (of course, not evenly); while wild animals are bearing and will bear in the future very significant costs, without any responsibility for or any benefits from the use of fossil fuels.

On this view, then, it matters that the wild animal suffering caused by climate change is anthropogenic. Since humans – or some humans – caused it, they are responsible to do something about it, and to help those animals that they have made vulnerable or caused to suffer. In the animal ethics literature, this is frequently discussed in terms of justice and, especially, animals' rights.[23] Climate change is understood here as an infliction on wild animals for which something is owed – an obligation to reduce or avert the injustice, to assist in adapting to the new situation, or to carry out some kind of moral repair.

Arguments that climate change is unjust to wild animals, and that such injustices should be stopped or rectified, however, run into difficulties about who is responsible to act. So far, I've talked rather casually about "humans" being responsible; but obviously, some humans are much more responsible than others (and of course, many *humans* have also been unjustly affected by the negative impacts of climate change.) Because the idea of climate justice to wild animals is about causal responsibility, it does require consideration of complicated issues concerning *who* is responsible for *what* that I don't have space to tackle here. This problem is somewhat mitigated in the case of wild animals, however, as plans to assist wildlife in the context of climate change would generally be the responsibility of wildlife agencies and NGOs, rather than individual humans.

So far, then, I've outlined three ethical reasons for concern about the impact of climate change on wild animals: the loss of valuable wild animal species and populations, the welfare loss (such as suffering) caused to individual animals, and the injustice of humans perpetuating and benefiting from practices that are causing harms to wild animals. But what are the implications of this for ethical policy responses to climate change?

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[21] Clare Palmer, *Animal Ethics in Context*. (Columbia 2010).
[22] John Nolt, 'Nonanthropocentric Climate Ethics' (2011) 2 WIRES Climate Change 700.
[23] Angie Pepper, 'Adapting to Climate Change: What We Owe to Other Animals' (2019) 36 Journal of Applied Philosophy 592.

4 Ethical Responses to Climate Change

From all three positions, climate change is ethically problematic. As such, some kind of policy response appears to be needed, either to stop the moral wrong or in some way to repair or compensate for it. The difficulty here though, as I'll attempt to show, is that because these three different ethical approaches understand the basic ethical problem differently, they won't always agree on what policy responses are most appropriate. This is not an overwhelming problem, but it certainly makes decision-making more complicated. In the upcoming sections of the paper, I'll try to explain this, using some specific examples.

However, there's one issue I should clarify first. One obvious thought here might be that the best way of doing anything to help reduce species extinction, impacts on wild-animal welfare, or injustice from climate change is *mitigation* – tackling the problem at its source by reducing carbon dioxide emissions or developing and expanding ways of carbon capture. And of course, in the long term, this is right. However, this is a global strategy that will take decades to unfold, and as negotiations at various recent COP meetings indicate, is facing headwinds. The global mitigation process, if successful, will over time reduce the number of species that go extinct. However, it won't much help species declining rapidly over the next couple of decades, nor individual animals caused suffering or injustice now. It's for this reason that those concerned both for wild animal species and wild animal individuals are focusing on what is sometimes called "adaptive assistance" – helping wild animals either as species or as individuals to adapt and survive in the face of a changing climate.

What strategies are actually available to do this? Traditional approaches to conserve wild animal species have generally focused on protection by setting land aside, creating nature reserves where wild animals can live relatively free of human intervention; indeed, recent research suggests that creating legally protected areas is still the most common response.[24] This can be especially helpful to climate-threatened wild animals where protecting land increases connectivity, giving wild animals more opportunities to migrate or relocate in response to a changing climate. But in many cases where climate change (rather than other human activity) is the threat, setting land aside may not be very effective. Even in designated wilderness areas the climate is changing, there will be climate-enhanced floods, droughts, and wildfires, and ecosystems will shift around the animals; this means that neither species nor individuals will necessarily be protected by such "hands-off" strategies.

Other traditional conservation strategies may help here, however. For instance, one way of assisting species under climate pressure is to reduce other, non-climate stressors such as pollution or hunting. Another is to create new habitat where habitat has been lost – for instance, creating new freshwater habitat where rising sea levels mean that formerly freshwater habitat has been salinized. Other possibilities include the extension of traditional, but less used, strategies to assist wild animals, such as augmenting food supplies or creating supplementary food and/or water sources if there are changes to food access, and rescuing wild animals from extreme situations such as flooding. Beyond this, there's a range of more radical, much less traditional interventions that include genetic manipulation (for instance, gene editing populations to increase their resilience to particular features of climate change, such

[24] Olivia E. LEDee, Stephen D. Handler, Christopher L. Hoving, Christopher W. Swanston, Benjamin Zuckerberg, 'Preparing Wildlife for Climate Change: How Far Have We Come?' (2021) 85 Journal of Wildlife Management 7.

as increased temperatures) or assisted migration (moving wild animals to new habitats with a more suitable climate, frequently beyond their historical range). These more radical strategies may, however, present complex policy and legal problems. More directly for my concern here, the three different ethical approaches I've discussed don't always agree about which strategies should be pursued. I'll consider some cases here that outline both possible convergence and divergence between these ethical approaches.

5 Convergence and Divergence in Ethical Climate Strategies

I'll begin with a case that looks like *convergence* – where all three of these approaches are likely to agree on a particular strategy. Owing at least in part to climate change, water resources used by wildlife in areas of Mexico's Yucatan Peninsula are drying out. Animals such as the endangered Central American tapir are unable to find enough water as the small, shallow lagoons on which they rely are disappearing. This enhances threats to the Central American tapir species, leads to welfare decline for individual tapirs (however welfare is interpreted) and is an anthropogenic harm; so, it's a problem on all three ethical approaches. In response to this threat, the WWF is proposing to install and monitor artificial water sources in the area.[25] Let's assume (for the purposes of the argument) that doing so would not cause problems to some other species/sentient beings elsewhere. Then installing these water sources could help to protect the endangered Central American tapir species, improve the welfare of animals that otherwise would suffer and perhaps die from thirst, and prevent the unjust harm that would be caused by anthropogenic water loss to wild sentient animals. This strategy looks effective even with different accounts of welfare, since tapirs surely desire water, and having access to drink it would give them better ability to fulfil their natural behavior. It's likely, then, that all three approaches would agree on this policy (although for welfare-consequentialists, the costs and benefits of introducing artificial water sources would have to be compared with the costs and benefits of spending similar amounts of resources on other projects; it's possible that more welfare could be gained from an alternative strategy).

However, while there's strategic convergence in this case, significant divergence is likely in many others. Central American tapirs are herbivores; improving their welfare is unlikely to have negative implications for other animals. But suppose the animals at issue were members of an endangered *predator* species, and that the water resources would only help this species. From a species-oriented view, this would not change the situation: if artificial water sources would save the species, there's a good ethical reason to provide them. A similar argument might be made from a justice-oriented view: if providing predators with water protects them from the injustice, or rights violations, brought about by anthropogenic climate change, then provision of artificial water sources seems ethically justified. However, many welfare-consequentialists in animal ethics – especially those concerned about suffering, who predominate – are uneasy about predation in general, and therefore concerned about offering resources to predators.[26] Providing artificial water sources for predators could only be justified if it reduced suffering overall; and this would need to take into account

[25] Worldwide Fund for Nature. How artificial waterholes help Mexico's wildlife survive Mexico's changing climate <https://www.worldwildlife.org/stories/how-artificial-watering-holes-help-wildlife-survive-mexico-s-changing-climate> accessed 3 August 2023.
[26] For instance, Tyler Cowen 'Policing Nature' (2003) 25 Environmental Ethics 169.

the suffering *caused* by predators now able to flourish because water has been provided. After all, if the predators cause more suffering to their prey than the lack of water causes to the predators, then providing the water just increases, rather than decreases overall suffering.

And provision of water is not the only example here. Short-term supplementary feeding of polar bears has been proposed for the predicted occasions when the ice they need for hunting forms so slowly in the autumn that they may otherwise starve.[27] Both species-preservation and justice-oriented views may argue in favor of such assistance; it could help both in conserving the species and in at least making a move towards rectifying an injustice caused by climate change. But since polar bears are predators who largely subsist by killing ringed seals, helping them might not be a strategy acceptable on a welfare-consequentialist view. While the sums *might* work out in favor of the predators like polar bears, protecting them from climate impacts is much less obvious than it would be on the species- or justice-based views.

This is not the only area of potential disagreement, however. Justice-based views are much less likely to support strategies that have the effect of harming some individuals in order to benefit a greater number of other individuals, or to preserve a species. An example may help to make this clear. Pepper, an animal rights theorist (mentioned above) argues that, as a matter of climate justice, "nonhuman animals are owed adaptive assistance to help them cope with the ill-effects of climate change."[28] She considers several ways in which animals might be helped, including assisted migration, on which I'll focus here. Assisted migration, as noted above, translocate animals to new habitats more suitable given a changing climate. But as Pepper notes, all translocations pose risks to the animals concerned, and in some species, those risks are high, especially for the first generation of animals moved. And it's this that could wedge different ethical approaches apart.

Suppose that the ethical goal of an assisted migration is to conserve a species. While there may be significant losses of individual animals in the first translocated generation, if there's a good chance of the translocation succeeding over time, then species conservationists are likely to support it. It may mean that viable populations of the species can persist despite the changing climate. Welfare consequentialists *may* also accept translocation to improve overall welfare in circumstances like this – but this would need to be taken on a case-by-case basis. First, whether to proceed would depend on the species at issue (so, as discussed above, there's unlikely to be support for the translocation of members of predator species). And second, whether to proceed will also depend on how the expected "welfare-sums" add up. This means thinking about the negative welfare created and the positive welfare lost due to climate change, if populations are *not* translocated, against the welfare losses and gains if they are – including the potential creation of flourishing future populations that wouldn't have existed without translocation. If both the welfare losses brought about by climate change, and the welfare gains brought about by translocation, are high then welfare-consequentialists could accept significant welfare losses and deaths of animals in the process of carrying out that translocation. This won't be true in all cases, but there's no in-principle objection to sacrificing some animals' lives and welfare now for welfare gains in the future (including the creation of future animals that wouldn't otherwise have existed).

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[27] Andrew Derocher et al 'Rapid ecosystem change and polar bear conservation' (2013) 6 Conservation Letters 368.

[28] Angie Pepper, 'Adapting to Climate Change: What We Owe to Other Animals' (2019) 36 Journal of Applied Philosophy 592.

On a justice view, however, assisted migration is even more complicated. Unlike on a welfare-consequentialist view, there isn't an aggregation process here. If some animals will plausibly be harmed or killed by being translocated, then on many justice views, the translocation should not be carried out, *even if* doing so would lead to flourishing populations down the line. Take a leading animal rights view such as that of Donaldson and Kymlicka, who argue that sentient animals have inviolable rights that cannot be sacrificed for the greater good of others.[29] Translocating animals at very high risk to their lives is surely rights-violating on this account, causing new injustices to animals that are already suffering from injustice. For strong rights views like these, the only justification for carrying out such translocations would be if the individual animals being translocated were *themselves* so threatened by climate change (also taken to be rights-violating) that the risk from moving the animals is a risk worth taking *for them*. Of course, not all justice-based views are as stringent as this; some rights views don't apply rights-based side constraints so strongly; and other justice approaches would allow for at least some consideration of the benefits of assisted migration in terms of restorative justice.[30] But again, this would require consideration of the specific case – and the kind of case that's ethically acceptable on a *justice* account may not coincide with the cases ethically acceptable on a *welfare consequentialist* account.

6 In Conclusion

Climate change threatens species, will reduce the welfare of many wild animals, and can be seen as an injustice to individual wild animals. From all these ethical perspectives, adaptive assistance appears to be an ethically justified – perhaps required – policy response. However, because the ethical focus of these perspectives is so different: species value, welfare, justice – what *counts* as appropriate adaptive assistance will often diverge. For those primarily concerned about preserving *species* values, animal welfare and justice to individuals may not matter very much. Those for whom maximizing good *animal welfare* is a priority won't wish to assist species or individuals if such assistance is likely to reduce welfare overall, however rare the species concerned. And those primarily concerned about justice will not want to undertake assistance that plausibly itself causes new injustices – and this is likely to apply not only to assisted migration, but also to other practices that may cause harms to some in order to create or help others, such as captive breeding, de-extinction and genetic rescue – even though these practices may save species and boost welfare overall.

All this means that while the negative impacts climate change is having on wild animals are increasingly severe, and unethically unjustifiable from a multiplicity of ethical perspectives, what is to be done about it – ethically, at least – is much less obvious. What's meant by "success" in ethical terms is complicated, given that so many different ethical goals may exist.

One way forward here – given the high numbers of climate-induced problems wild animals face – is to prioritize those policies and strategies on which different ethical approaches *can* agree. I began with a case like this: the provision of artificial water sources to the central American tapir. Another recent case is the provision of supplementary water to tule elk at Tomales Point in California in an intense, climate-

[29] Sue Donaldson and Will Kymlicka *Zoopolis: A political theory of animal rights*. (Oxford 2011).
[30] Thanks to an anonymous referee for making this point.

enhanced drought.[31] This water provision is likely to help both the population and species to persist, to reduce the number of elk suffering poor welfare from the drought (without creating serious threats to the welfare of other animals) and to help repair injustice caused by the likely anthropogenic enhancement of the drought.

To conclude then: Climate change does pose ethical problems with respect to wild animals, but these problems can be understood very differently from different ethical perspectives, leading to disagreements about whether, when, and how to assist. When reviewing strategies, policies, and legal frameworks for responding to climate change in the wild, it would be helpful – at least in ethical terms – to consider all these different perspectives. Responses that are likely to succeed in conserving species, improving welfare *and* responding to or preventing injustice are, in terms of ethics at least, surely particularly desirable and worth pursuing.

[31] National Parks Service, Tule Elk at Tomales Point FAQ <https://www.nps.gov/pore/learn/nature/tule_elk_tomales_point_faq.htm> accessed 13 November 2022.

Radiant Ecologies: The Biopolitics of Animal Photography in Exclusion Zones

Paromita Patranobish*

Abstract: This article wishes to examine photographic representations of animal life in the post-disaster landscapes of Chernobyl and Fukushima. It seeks to articulate how documentary and investigative modes employed by a visual repertoire developed in relation to these disaster zones, intersect with a biopolitical imaginary, which, by creating an ontological collapse and interchangeability between radioactive spaces and nonhuman materialities – including the matter of animal lives– enacts an exclusionary paradigm that is rooted in speciesist violence. A common trope used to frame animals in these sites of nuclear disaster is that of resilience and rewilding. This framing has been deployed in recent times by scientific analyses (James Smith, Nick Beresford et. al., 2019, 2005; Lyons et. al., 2020) as well as popular discourses to depict animals, particularly wildlife, as prolific and invasive, governed by an inhuman excess that allows them to thrive in environments otherwise hostile to humans. This narrative of an alien affinity towards forms of toxicity, while positioning animals on a common spectrum of danger and alterity in which they share attributes of anarchic and uncontained growth, dispersal, and mutation with nuclear waste and the action of radioactivity, simultaneously obscures other narratives of precarity and harm accruing to nonhuman lives and habitats through their proximity to nuclear pollution, and pollution's ties with anthropogenic, military-industrial regimes. (Sohtome et. al., 2014; Itoh 2018). Drawing on recent work by Elaine Gan, Anna Tsing, and Kate Brown, my paper explores the figuration of animals in disaster zone imagery in relation to questions of ruination, haunting, decay, and waste as constituting what Tsing calls "disturbance regimes." (2015) The nexus of toxic exposures and ecocidal effects of nuclearization of environments not only impinges on existing ecological relations, altering and corroding these, but also enforces new and saturated chemical ecologies. Through a close reading of the works of Julia Oldham, Yasusuke Ota, and Pierpaolo Mittica, my article engages with the implicit dialogue between such radioactive ecologies in post-disaster sites in the wake of evacuation and abandonment, and the ways in which visual media, particularly photography, participate in these ecological (dis)arrangements by encoding animal life and its survival in the post-human aftermath of human departure, within various symbolic and semantic codes, codes whose stability is further challenged and complicated by what Daniel Burkner (2015) identifies as the material politics of photographing radioactive spaces.

Keywords: Nuclear toxicity; ecophotography; disaster ecologies; biopolitics; multispecies encounters; speciesism; precarity.

> The photograph is literally an emanation of the referent. From a real body which was there, proceed radiations which ultimately touch me, who am here, the duration of the transmission is insignificant; the photograph of the missing being, as Sontag says, will touch me like the delayed rays of a star. A sort of umbilical cord links the body of the

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> photographed thing to my gaze: light, though impalpable, is here a carnal medium, a skin I share with anyone who has been photographed.
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> Roland Barthes, *Camera Lucida*, 80-81[1]

In Darmon Richter's photo (Richter, 2020) an apparently tame fox occupies centre stage.[2] Its relaxed yet alert posture and outward, anticipatory gaze alluding to its feral field of vision literally and figuratively beyond the frame, is the subject of the camera's focus. Behind the seated animal and shot at an angle to illustrate its monumental size, is a now decaying concrete sign in Russian that reads "Pripyat 1970" the date referring to the year of the Ukrainian city's founding, while all around the canid presence teems lush vegetation. The latter's fecund green hue seemingly radiating out of the ground and suffusing the scene with a spectral light that is characteristic of several of Richter's Chernobyl photos, offers a rich palette of contrasts with the warm tones of fox fur while offsetting the muted lithic grey of the vestigial semiotics of a long evacuated human presence. Fresh flowers thronging the sign in the background indicate the ruined city's memorialized status, suggestively pointing to an embedded melancholic history while self-reflexively underscoring the active and continuing participation in the present of cohorts of stakeholders from security personnel and small groups of returning locals, to scientists, journalists, artists, photographers, and occasional tourists and adventuring or opportunistic trespassers– stalkers, sepulking 'patriots' and scrap collectors, who comprise the region's hybrid and shifting demographic.[3] The sign points West towards the atomic city, directing our gaze to its short but tragic urban history of decline from planned and manicured Soviet technoscientific utopia of clean and economical nuclear energy to a dystopian site of catastrophe and loss, while in the foreground, the sign's navigational gesture is undercut and deflected at a right angle by the animal's gaze mobilizing the visual field towards an unseen frontal horizon. In the open space to the right the camera inserts its own optical logos both engaging in dialogue with and framing the competing visual indices of nature and culture without subsuming these into a totalizing perspective.

The camera's triangulating locution invitingly appropriates and draws the viewer's gaze inwards towards an elusive meeting point at the image's centre where culture and nature, human and animal, past and future, are suspended in a state of what Isabelle Stengers calls "reciprocal capture." (Stengers, 36)[4] This interplay of

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[1] Roland Barthes, *Camera Lucida,* New York: Hill and Wang

[2] Darmon Richter, *Chernobyl: A Stalker's Guide*. FUEL Publishing, 2020

[3] See Kate Brown's discussion of spelunking expeditions in her essay "Marie Curie's Fingerprint: Nuclear Spelunking in the Chernobyl Zone." Spelunking refers to what has become a regular activity, laden with political and ideological meaning, where Soviet loyalists visit the sarcophagus and the remains of the exploded reactor for close encounters with radiation. These trespassers attempt to capture the radioactivity in the reactor using photography and infrared light, even as they expose their bodies to hazardous levels of toxicity. In her ethnographic interviews Brown talks to Aleksandr Kupny and Sergei Koshelev, regular visitors to the ruined reactor who see these ritualistic returns to the radioactive core as a form of nationalist engagement with histories that the community as such wishes to bury. Kupny's photographs of radiation are testimonies and reclamations of an endangered yet living archive, one that he seeks to preserve against amnesia.

[4] Stengers describes this phenomenon as forms of multispecies relationships in which the modes of existence of one entity, its behavioural patterns, meaning making processes, bodily functions, habits and dispositions become relevant to those of another as part of the latter's environment and more specifically its particular habitat, informing its referential horizon and the ways in which it makes sense of the world. This way of understanding interactions across species and ontological difference not only brings the fact of constitutive relationality rather than bounded singularity, the always already mutually interlocked nature of existence which may or may not always be symbiotic but is a

visual indices is not merely a decorative or aestheticizing impulse; rather, Richter's carefully orchestrated image deploys pictorial codes to construct a symbolically charged figurative language, one that charts via a richly allegorical use of light, colour, angles and placement, a synoptic narrative of the gradual but steady erosion of anthropogenic markers and their replacement by nonhuman agents and materialities. Richter describes Chernobyl's wild ecology, and its inherently plural and contradictory landscape as an Edenic space that speaks to a larger mythopoeic imaginary. What this dense visual field both conceals and reveals also however is a historical and ontological entwinement and folding of the human and nonhuman, lively and inorganic, renewal and decay, culture and nature, meaning and matter, absence and presence, phantasm and real, an entwinement that is the temporally layered and epistemologically complicated legacy of nuclear modernity.

In 2011, a few weeks after the meltdown of the reactor core at the Fukushima Daiichi nuclear power plant led to the release of fatally high doses of radioactive substances into the atmosphere, Shimpei Takeda performed a camera-less photographic experiment. Earlier he had toured the devastated sites of Okuma in the vicinity of the Tepco power plant and collected soil samples. Placed on photosensitive paper and left in darkness, these samples created their personal photographic prints-- the high doses of ionizing radiation absorbed by exposed particles acting at once as a source of internal illumination and an inscriptional mechanism. Called "radioautographs," and collated as the Trace series, these automatic 'images' formed without the mediation of a recording or capturing device, testify to the paradox at the heart of the relationship between photography and radiation.[5] Akira Mizuta Lippit in his book *Atomic Light* (2005) discusses how the introduction and popularisation of nuclear energy as the apotheosis of military-industrial modernity in the twentieth century brought about a radicalisation of the field of visuality and visual practices, including artistic practices, through the capacity of radioactive phenomena to overturn dominant metaphysical conceptions of visible and invisible, outside and inside, transparent and opaque, presence and absence, as well as probe the limits of perceptual and cognitive abilities and habits. The irradiated sites left in the wake of nuclear disasters and the subsequent ecological reconfiguration of toxified lands through the protracted effects of radioactive fallout, frame the crises of species extinction, habitat loss, terraforming and the erosion of vernacular practices and cultural memories in new ways that exceed established conservationist and ethico-juridical imaginaries.

This paper wishes to examine photographic representations of animal life in the post-disaster landscapes of Chernobyl and Fukushima. By examining the work of photographers working with multiple media and at the intersection of art photography, photojournalism, animal, environmental, and anti-nuclear activism, species rescue, fostering, and caregiving, in these radioactive sites, my analysis aims to understand how specific modes of visual engagement with and interpretation of nonhuman life in places affected by anthropogenic and climatic disasters interacts with scientific and popular cultural imaginaries of nonhuman flourishings and endangerments in disaster ecologies. In particular, I wish to examine the tropes that posit animal life in depopulated sites of nuclear disaster as both miraculously immune to the biological damage caused to humans by radiation exposure, as well as thriving

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constantly dynamic and plural field that precludes the imposition of any single, homogenous or totalizing model of ecological coexistence that is based in attempts at classification, polarization, hierarchization and ultimately subsumption of difference.

[5] Shimpei Takeda, the *Trace* series, 2012, gelatin silver print. For a detailed study of Takeda's work see Davre (2019)

in the wake of human evacuation, particularly in the absence of farming, industrial, and commercial activity. This approach to resurgent flora and fauna in emergent radioecological sites has been deployed in recent times by scientific analyses (James Smith, Nick Beresford et. al 2019, 2005; Lyons et. al 2020) as well as popular discourses to depict animals, particularly wildlife, as prolific and invasive, governed by an inhuman excess that allows them to thrive in environments otherwise hostile to humans.

This narrative of an alien affinity towards forms of toxicity, while positioning animals on a common spectrum of danger and alterity in which they share attributes of anarchic and uncontained growth, dispersal, and mutation with nuclear waste and the action of radioactivity, simultaneously obscures other narratives of precarity and harm accruing to nonhuman lives and habitats through their proximity to nuclear pollution, and pollution's ties with anthropogenic, military-industrial regimes. (Sohtome et. al 2014; Itoh 2018) My comparative analysis is cognizant of the fact of the comparative scales at which the respective disasters unfold– the ways in which time and temporality operate differently in each case. The specific dynamics of the respective crises in Chernobyl and Fukushima present differential scales for understanding disaster and alert us to the coexistence of both, the more palpable spectacularity of accidents as well as their intangible but enduring dimensions. This play of multiple scales, which is in some ways integral to how nuclear disasters operate, also leads to new ways of conceiving time beyond the strictly historical time of the anthropos as an expanded concept that includes more than human and material temporalities.

1 Radioactive Visualities

From Wilhelm Röntgen and Antoine Henri Becquerel's deployment of radiation as a form of image making process that could permeate, render porous and ultimately overturn the epidermally bounded and enclosed body, to the cultural phobias, anticipations, and anxieties around the twin tropes of technological progress and planetary annihilation engendered by atomic power and explored in particular through an affectively charged and ideologically inflected nuclear imaginary in the postwar period– nuclearity emerges in the 20th century as a complex conceptual, epistemological, material and geopolitical field constellated around questions of militarisation, nationalism, and economic development, structured by the norms of capitalist production on the one hand, and the requirements of emergent biopolitical surveillance and security regimes on the other. According to Claudette Lauzon, "Cold war imagery presented both the official positive image of nuclear power and military supremacy translating the propagandist vision promoted by governments into an iconic visual rhetoric that still resonates today while at the same time contributing to larger existential and physical fear of unknown risk."[6] (293)

The relationship between the field of modern nuclear energy and practices and epistemologies of visuality extend beyond the formation of a specific imaginary of the atom's unprecedented power as well as its constitutive alienness, articulated in particular through a repertoire of images of mutant monstrosity and transhumanist heroism in speculative genres of Cold war era science fiction, gothic and horror literature and cinema: "[R]adioactive monsters, utopian atom-powered cities, exploding planets, weird ray devices, and many other images [have] crept into the way

[6] John O' Brian and Claudette Lauzon (eds.) *Through Post-Atomic Eyes* John , McGill-Queen's Press, 2020.

everyone thinks about nuclear energy, whether that energy is used in weapons or in civilian reactors. The images, by connecting up with major social and psychological forces, [have] exerted a strange and powerful pressure within history. (Weart, xi)[7] The material action of atomic energy upon time, space, and bodies itself evinces a visual dimension, one that both registers through as well as confounds biological and cultural limits of vision: "the flash so bright, the heat so hot, nearly every surface becomes a photographic plate." (Brown, 106) The most telling example of this is the hibakusha body– those instances of instantaneously incinerated flesh produced by atomic heat at Hiroshima and Nagasaki, which when subjected to radiation's exposure turned into photosensitive surfaces and thus dissipated while leaving behind photographic traces in the form of their own dark negatives.

As Brown's study of the visual aspects of nuclear power demonstrates, when it comes to nuclear toxicity, the question of visuality is no longer confined to the politics of representation. Instead, it indexes nuclearity's production of certain new forms of visualisation and materialisation. These new visualities reinforce the close proximity between modernity's technoscientific regime of violence and its framing of the visible and sensible order of reality:

> [I]f the atomic blasts and blackened skies can be thought of as massive cameras, then the victims of this dark atomic room can be seen as photographic effects. Seared organic and nonorganic matter left dark stains, opaque artifacts of once vital bodies, on the pavements and other surfaces of this grotesque theater. The "shadows," as they were called, are actually photograms, images formed by the direct exposure of objects on photographic surfaces. Photographic sculptures. True photographs, more photographic than photographic images. (Lippit, 44-45)[8]

The presence of radioactivity thus not only destabilizes metaphysical and phenomenal binaries between presence and absence, visible and invisible, the real and the spectral, it also re-signifies the realm of the unseen and phantasmatic as specific ontologies animated by forms of matter and modes of existence cohabiting in relational assemblages with human and nonhuman bodies. Nuclear phenomena including irradiated places and contaminated landscapes, as my article will demonstrate, dramatize what Karen Barad calls the intra-activity of quantum dynamics.

As physical phenomena that intervene into those conceptions of time and space which divide these into discrete and autonomous units, radioactivity institutes new orders of spatio-temporality that highlight the always already entangled nature of all phenomena, including cultural phenomena. The latter are shown to exist not as predetermined entities that then enter into relationships along a subject-object axis, but rather as immanent forces and vectors that are diacritically constituted into stable entities through and in the process of interacting with other iterations of matter and their specific manner of engaging and calibrating time and space. Nuclear phenomena, as the example of radioactive decay indicates, establishes a particular temporal paradigm that is based in delayed, generationally distended effects that disrupt our compartmentalized understanding of time as a set of coherent periods: "Radioactive decay elongates, disperses, and exponentially frays time's coherence. Time is unstable,

[7] Spencer *Weart, Nuclear Fear: A History of Images,* Harvard University Press, 1988
[8] Akira Mizuta Lippit, *Atomic Light (Shadow Optics)*, University of Minnesota Press, 2005

continually leaking away from itself." (Barad, 63)[9] This in turn makes the work of nuclearity be it as a source of energy in industrial capitalist and military nationalist contexts or a form of multiscalar chemical toxicity either impinging upon ecosystems through slow seepages or catastrophic disasters – an archaeology of the unseen and invisible as sites and processes of violence, ecocide, loss, and ruination.

Nuclear disasters are informed by the very hauntological structure of radioactivity, by the capacity of radioactivity to underscore by drawing critical attention to the domain of potentiality, immateriality, and spectrality the significance of the unrepresentable and unseeable. Nuclearity's encoding of the invisible as a vital part of its representational structure, exposes these disaster zones as politicized sites in which power structures and social inequities both inhere and can be interrogated. This new iteration of visuality thus serves as a deconstructive tool emphasizing the need to retrain our focus on the question of invisibility and the metaphysical devaluation of unrepresentability and of that which is excluded from the field of representation only to be reappropriated as the inferior and abject other. The nuclear disaster is thus not an isolated environmental concern; rather it is a complex cultural topography involving histories of displacement and relocation, relationships with land and questions of cultural identity, belonging and exile.

Daniel Burkner (2014) explores the tantalizing spectrality of radioactivity that is at once invisible to the human eye yet profoundly and lethally reactive and invasive. He argues how radiation produces its own bifurcated visual schema: an iconographic model that involves tangential representations of symbolic landscapes where radioactive impact is recorded indirectly through figurations of absence, loss, decay, mutation and debility; and a material model where photochemical media are used to directly capture actual particles of radiation.[10] In both cases however, the quantum dynamics of radioactive matter as at once a tangible material substance and a set of protracted, dispersed, intangible, and indirect effects that mediate and transform our corporeal experience of time and space challenging in turn perceptual habits and cognitive limits, intersects with visual epistemologies and representational practices, to generate new ways of looking. To update Walter Benjamin's concept of the optical unconscious, that otherwise invisible domain inaccessible to the human eye, opened up by modern visual and cinematic media's technologies of close-up, enlargement, and slow-motion– irradiated environments as subjects of photographic capture enable the formation of a *nuclear unconscious* that generate idioms and imaginaries of what Lippit calls "avisuality": forms of visualizing the invisible which destabilize hierarchical binaries between the seen and unseen that structures much of western thought:

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[9] Karen Barad, "Troubling time/s and ecologies of nothingness: re-turning, re-membering, and facing the incalculable," *New Formations*, Number 92, September 2017, pp. 56-86. See also Haraway on intra-activity as the basic relational currency of ecosystems. Ecosystems are composed not of materially and speciestically discrete forms as modern taxonomic discourse deems; rather entities exist as relationally entangled assemblages or what Haraway calls sympoietic "knots of diverse intra-active relatings in dynamic complex systems." Haraway's term for these complex patternings or co-involutions of existence allows us to rethink ontological boundaries and distinctions, including those between humans and nonhumans, nature and culture, organic and inorganic, living and dead, as unstable formations where identity is not a transcendent category based on a system of distinctions and groups in symmetrical sets but a constantly mutating field comprising interactions between disparate holobionts across space time and scales with no pre existing paradigm of association except the contingent and processual situated demands of living together and sharing common existential grounds.

[10] Daniel Bürkner, "The Chernobyl Landscape and the Aesthetics of Invisibility." *Photography & Culture* 7.1, pp. 21–40, 2014

> Avisuality is the possibility of the spaceless image, the impossible figure of that which cannot be figured, an image of the very facelessness of the image. It opens onto a site of the atomic spectacle that is irreducibly ecstatic, other—archival. Avisuality is, perhaps, the only true semiotic of the archive. Its only figure, or sugata. In the archive of atomic destruction, at its center, in the place where it takes place, inside and out, transparent and invisible, the spectacle of the impossible signifier burns, cinefied: radiant, specular, avisual. (102-03)[11]

As scholarship by Weart (1988), Lauzon (2020), and O'Brian (2015, 2020) suggest, nuclear photography be it the state sponsored visual repertoire idealizing atomic energy's peaceful and prophylactic uses, circulated during the cold war period, or the rise of hybrid multimedia practices from documentary photojournalism to art and experimental photography, emerges as a generative site for articulating visual culture's links in the late capitalist period with technoscientific geopolitical regimes, particularly in the ways in which the specific concerns that are intrinsic to visualizing atomic power and nuclear cultures are concerns that inform and are pertinent to the Anthropocene as a nuclear formation. These include the dialectics of the visible and invisible, the question of absences, elisions, suppressions, and their illicit or violent returns to the cultural or psychic scene, the modern recalibration and politicization of life as an increasingly permeable site subject to constantly shifting standards of legibility, legitimacy and control, and the omnipresence of forms of death that acquire necropolitical dimensions in modernity, shifting from private and individual domains to becoming associated with capitalism's colonial, extractive and carceral practices, and extended thus to forms of species wide and planetary extinctions.

In the era of nuclear energopolitics, the geologic record created by human activity becomes inseparable from the wastelands of radioactive decay set into motion by atomic practices. It is in these two senses– firstly, the avisual representational possibilities opened up by radioecological imaging, and secondly, nuclear energy's encoding of the vital significance of the invisible, imperceptible, and intangible as dominant phenomenologies in the Anthropocene– either in the form of such planetary hyperobjects as climate change and global warming, or through neoliberalism's technologies of exclusion, ellison and erasure of populations and ecosystems– that nuclear photography both as a critical methodological anchor, and a practice of environmental intervention, what Karla McManus calls "ecophotography" (McManus, 2014)[12] becomes pertinent to the question of the nonhuman. It is in this vein, also, that photography in the context of nuclear disasters addresses the crisis of representation that Rob Nixon (2011) in his important work on emergent forms of contemporary global violence identifies as central to the disparities and damages of our times.[13]

2 Photographing Animals: Some Methodological Provocations

The photography of animals in sites irradiated by nuclear disasters thus serve as critical explorations of the specific form of precarization that accompanies neoliberal capitalism's military-industrial mobilization of planetary resources. Beyond their

[11] Ibid.
[12] Karla McManus, *Eco-Photography: Picturing the Global Environmental Imaginary in Space and Time.* (PhD Thesis) Concordia University. Supervisor: Martha Langford, 2014
[13] Rob Nixon, *Slow Violence and the Environmentalism of the Poor*, Harvard University Press, 2011

ethical and political import as archives of and commentary on the question of nonhuman victimhood, erasure, exploitation, commodification and invisibilization, these photographs also underscore the hidden subtext of the ecological implications of rampant nuclearization and the anthropocentric hubris that underlies these new regimes of energy and resource mobilization.

The snapshot of fauna and flora in landscapes devastated or rendered inhospitable to humans in the wake of radioactive fallout are not mere documents of singular events; rather these images point to the permanent state of risk that is the constitutive condition of life that humans and nonhumans are forced to inhabit, the omnipresent horizon of disaster and accident that is a structural feature of the Anthropocene. By foregrounding animals and the fate of nonhuman subjects in anthropogenic disasters, these images shift the focus of suffering and precarity to forms of life, death, survival, impairment, sentience, and sociality under conditions of duress that do not posit the human as their protagonist, while simultaneously dissociating this anthropological centrality from the domain of visual representation itself. Likewise, the field of animal photography in post-disaster sites is implicated in a broader set of concerns regarding different kinds of visual and visualizing practices that have emerged in the context of natural and anthropogenic disasters– documentary photography and cinema, scientific image making practices like statistical data charts and maps, specimen photography, x-rays and other laboratory imaging modes, ethnographic and archival representational formats like onsite and live action photography, and visual genres and modalities associated with the proliferating domains of artistic and touristic interest in radioactive sites.

These multiple modes of visualizing disaster and its aftermath are implicated in the ethics and politics of image making practices: the role of the photographer (and her apparatuses of capture, mediation, representation and framing of 'reality') vis-a-vis disaster topographies and the contentious questions of intervention, neutrality, involvement, and critical distance that the photographer's proximity to instances of violence, injustice, and extinction, on the one hand, and the medium's own historical association, as a purportedly objective technological witness, with idioms of documentary truth telling and journalistic reportage, occasion; the issue of viewership including the politics of location and subject position that are underscored by particular stylistic choices as well as modes of consumption mobilized by practices and forms of dissemination– exhibition, publication, display, and circulation of images; and finally, the participation of photographic images in consolidating and/or challenging an existing discursive field of knowledge, policy, geopolitical mandates, and claims over these contested sites. The figure of the animal, particularly the Anthropocene animal, as both victim of industrial-capitalist disasters and subject of photographic intervention thus amplifies this pre-existing ethico-political field while also foregrounding debates about nonhuman sentience, suffering, agency, voice, and freedom that have been at the heart of animal ethics and animal studies as political and disciplinary formations.

Animal photography as a multifaceted genre spanning wildlife photography, scientific research, naturalist visual rhetoric and their complex histories within Western enlightenment modernity, documentary modes especially in relation to ecocritical and climate justice movements, and various hybrid and multimedia art photography practices also references the issue of the animal's double marginality and displacement in relation to human social, political, and ecological affairs– first as the othered occupant of the hierarchically arranged polarity with the human as the centre and apotheosis of the world order, and second as the passive and instrumentalizable object of various anthropocentric framings of this order, including representational

modalities of which photography is a part. The animal as an inhabitant of disaster ecologies in general and nuclear environments in particular is thus subject to double exposures– the toxic effects of disasters, specifically radioactive toxicity and its direct and pervasive contamination of animal bodies through permeation of the porous ecosystem, and the photographic gaze ramifying in turn into larger spectatorial scenarios of witnessing and/or consumption of the animal-as-image.

The nexus of toxic exposures and ecocidal effects of nuclearization of environments not only impinges on existing ecological relations, altering and corroding these, but also enforces new and saturated chemical or what Eben Kirksey (2018) calls "chemosocial" ecologies.[14] Through a close reading of the works of Julia Oldham, Yasusuke Ota, and Pierpaolo Mittica, and placing their photographic work in dialogue with a recent turn in biopolitical inquiry that seeks to reconfigure Foucault's analysis of biopower in relation to the current reinscriptions of life, liveability, and politics within the structures and infrastructures set in place by neoliberal geopolitical regimes of extractive and planet-burning consumption and control in the Anthropocene, my paper wishes to engage with the implicit dialogue between such radioactive ecologies in post-disaster sites in the wake of evacuation and abandonment. It further seeks to explore the ways in which visual media, particularly photography, participate in these ecological (dis)arrangements by encoding animal life and its survival in the post-human aftermath of human departure, within various symbolic and semantic codes, while also performing ecocritical interventions into late capitalism's ecocidal and speciesist apparatuses of capture.

3 Companion Species as Witnesses in Julia Oldham's Chernobyl Photographs

Julia Oldham's visual projects, photographs of dogs living in the exclusion zone and an accompanying documentary *Fallout Dogs* (2019) frame the companion species as a figure of the quintessential survivor of a nuclear apocalypse. The stray animal is the series' unexpected hero. Survivors of ecocide and inheritors of a destroyed habitat, the dogs of Pripyat are atypical candidates for heroic or messianic roles. Oldham's work undertaken in collaboration with guides and local residents of the Exclusion Zone, particularly Ludmilla Jurascho, who has been committed to caring for the stray animals of the area, dwells in the rich interpretive possibilities of this dissonance toying with a visual worldbuilding inspired by Chernobyl's resurgent animal populations. In these photographs, liminal figures of homeless dogs, occupying a fuzzy hybrid threshold between wild and tame, feral and domestic, outside and inside, stray and pet, ask us to rethink what concepts of heroism, salvation, survival, and resurrected life might look like removed from their moorings in grand eschatological narratives, and reconfigured in relation to the minor, quotidian, unglamorous, and monotonous registers of the animal's daily, even habitual negotiations with its *umwelt*. Oldham's Chernobyl triptych using resources of multiple mediums and genres– still photography, documentary cinema, stylized digital photo collages that make up the *Dogs of Future Earth* (2018) series depart from conventions of doomsday scenarios and carefully steer clear of the imposition of an overtly didactic point of view, even as they subversively and playfully mobilize generic tropes, most commonly those of science fiction and fantasy.

[14] Eben Kirksey, "Chemosociality in Multispecies Worlds: Endangered Frogs and Toxic Possibilities in Sydney," *Environmental Humanities* 12 (1): 23–50, 2020

Thus, in an opposite move from the visual templates of wild profusion popularized by photographers like David McMillan and Robert Polidori, Oldham's focus is not so much on the purported reclamation and dissolution of human structures by floral and faunal flourishings. Instead, her photography unpacks questions of sympoietic coexistence, co-constitution and caregiving as valid ethical responses, practices, and modes of collectively witnessing damaged ecosystems, by following and documenting modes of adaptation, occupation, and use by which animals establish new relations with old topographies, without necessarily displacing or usurping these. The idea of nonhuman salvage of human spaces is central to Oldham's tongue-in-cheek collages where dogs are shown as awkwardly and creatively repurposing the material universe left behind by extinct humans: Electronic monitors, satellite dishes, furniture and toys. While performing a gesture of decentering the human, these images also allusively dramatize and memorialize the tragic suffering of the pets that were left behind during Chernobyl's evacuation, using a futuristic set up to illustrate those disaster histories involving animal suffering that risk being erased from public memory. One image in particular, of different canine breeds wearing gas masks looking out from what appears to be a ruined assembly area offer multiple interpretive possibilities.

In terms of its fictional content, the image's strategic anthropomorphism creates an alternative speculative planetary order that is dominated by hitherto marginalized species; however placed in the context of the nuclear disaster the canine assembly also testifies to those ancestors of Oldham's subjects in her Chernobyl documentaries, who were consigned to interminable waiting and dying in abandonment, and for whom the evacuation that was itself premised on a speceistic arbitration claiming human lives as more valuable than animal ones, presented an extinction scenario. The title of the photocollage coupled with the military accoutrements also hints at the animals' existence in relation to a pervasive cultural norm of speciesist violence, what Dinesh Wadiwel in his provocative book calls "the war against animals," (2015) of which nuclear toxicity and abuse and abandonment in the wake of disasters, as well as technoscientific exploitation of docile animal bodies for furthering human knowledge, are interconnected strands. Oldham's futuristic settings, while celebrating canine ingenuity and resourcefulness, continually index the close links that these so-called future earth settings: landfills, toxic ruins and e waste dumps-- share with current landscapes of environmental degradation. In these techno-dystopias, radiation's invisible and spectral presence haunts these photos in their extended commentary on the politics of planetary toxification and critique of modernity's instrumental reason, of which the nuclear fallout serves as at once allegory and catalyst.

Oldham's photos in *Fallout Dogs* taken during her stay in the Exclusion Zone are intimate portraits of a form of multispecies coexistence that has emerged in the abandoned topographies, and what Jonathon Turnbull in relation to his own visual ethnography of human canine relationships in the zone calls "new forms of living, dying, and caring in relation to toxic exposures." (21)[15] In these images, we see dogs, all of them named and identified, juxtaposed with depopulated urban structures-- either ruins of the defunct power plant or abandoned buildings-- their lively and playful postures contrasted with the sombre starkness of monumental constructions. The animal's ludic absorption in and attunement to its immediate environment is placed in an ironic contrast with the now empty symbolism of Pripyat's decrepit Soviet

[15] J. Turnbull, *Checkpoint dogs: Photovoicing canine companionship in the Chernobyl Exclusion Zone, Anthropology Today*, Vol. 36 No. 6, 2020, pp. 21-24 doi:10.1111/1467-8322.12620

era iconography. Low angle, decentered shots of dogs lounging in front of memorial statuary, exploring the ramparts of derelict buildings, or using abandoned structures as sites of frolic, rest, and exploration, offer modes of recontextualizing the disaster by offering a dog's eye view of ruins. These images that are in turn products of the photographer's intimate, laborious, and ruins do not serve a heavily overdetermined and static indexical function of eliciting nostalgia for a reified anthropocentric history, but instead become vital, lively and contingent material components of the animal's immediate environment and meaning system. However, Oldham's photos are not oblivious to the permeation of this material environment by radioactive toxicity. In a set of closeups of feeding dogs, the presence of the animal bone at the focal centre of the photograph not only alludes to questions of survival, violence, particularly threats from wolves and foxes with whom the dogs share a common habitat, and kinds of exposures to harm and danger that are embedded in the very ecosystem, entering the dog's body in the form of radionuclides in the highly saturated soil or genetic mutations undergone by birds and insects that enter the food chain; the feral memento mori also foregrounds the spectral omnipresence of death and disease as integral to irradiated sites like Chernobyl.

In his photovoicing project on canine-human companionship in the Chernobyl Exclusion Zone, Turnbull observes that while the specific scientifically measurable and theorizable effects of radiation on animal biology continues to remain a matter of controversial debate and speculation, new kinds of affective bonds and social norms of companionship and reciprocity– distributed ownership and collective care, or detached forms of engagement that are more loosely structured than those with household pets for instance have emerged in the radioecological landscape based in a "potential for shared exposure which reveals a shared animality." (Turnbull, 24) This intersectional space where common threats– from radiation, loneliness, disease, and wild animals like wolves and boars, and shared grounds of resources and labor– guarding checkposts, patrolling desolate spaces, surviving attenuated climatic conditions, foster relationships between working class security personnel and dogs, is neither an apocalyptic wasteland nor a primordial Eden. Rather it is a site that generates new forms of attention, attunement, and interdependence where the centrality of the anthropocentric norm is replaced by posthumanist reconfigurations of concepts of personhood, autonomy, sovereignty and agency, in relation to terminal sites of risk and finitude. "[Va]riously labelled stray, street, feral, wild or homeless by different groups of people – scientists, tourists, NGO workers, publics," (22) the ambivalent and shifting roles and positions that Chernobyl dogs occupy complicate "the notion of dog ownership by blurring the owned/unowned binary," and testify to the zone as a site for "entangled histories" (21)

4 Yasusuke Ota's Photography of Care

The intimate playfulness of Oldhams photos is however missing from Yasusuke Ota's semi-documentary portraits of animal subjects caught in abandoned city spaces in the immediate aftermath of the Fukushima reactor meltdown. A combination of humour and pathos informs Ota's meticulous documentation of the fate of escaped pets and farm animals, abandoned livestock and shelter animals in the days following the triple disasters. We see a solitary ostrich loitering in an abandoned neighbourhood, distressed and fatigued pigs trying to cool themselves in a pothole, traumatized pets wandering through rubble, cattle patiently waiting for the return of humans. As the title of the series, Abandoned Animals of Fukushima indicates abandonment is the

central informing theme of Ota's photography where a conscious parallel is constantly suggested between the bodies of the urban animals and the derelict and empty post-evacuation habitats that they find themselves in. However, as an active volunteer who participated in rescue, rehabilitation and care of abandoned pets and farm animals, Ota is careful not to suggest a too-neat and unproblematic symbolic collapse between material ruin and abandoned critters. The question of care is at the heart of Ota's post-disaster animal photography. Entering the Fukushima no-go zone illegally as a volunteer, Ota along with a group of civilian animal activists were among the first responders to cater to the nonhuman victims of the tsunami-nuclear disaster. In the event of the disaster the government's immediate response with regard to animals was that of culling.

Considered to be toxic, animals including livestock and strays were shot as part of the government's clean-up and disaster management efforts. In an essay accompanying an exhibition of his photos held at the Huis Marseille, Ota attributes his documentary impulse to the government's inadequate and callous treatment of suffering animals, including forced secrecy, misinformation, and restricted access to places with trapped and injured animals, and the poor and inhospitable conditions in crowded and inadequately stocked state sponsored shelters where rescued animals suffered from cramping, malnourishment and neglect.[16] A trenchant and ironic illustration of this critique is the image of an ostrich, later found to be the mascot of TEPCO, the company owning the nuclear plant, walking down an empty street. While captured as a documentary vignette of the new ordinary in the aftermath of the disaster, the affective potential of the image lies in its staging of discordances and jarring discrepancies that telescopes the lived experience of the catastrophe by performatively elaborating the cognitive challenge and perceptual disorientation that is shared by human and animal survivors of large-scale calamities like the tsunami and nuclear meltdown.

The outlandish spatial tableau created by the presence of an exotic wild animal in the symmetrical layout of a modern urban neighbourhood, walking alongside parked vehicles, road signs and neatly arranged residential blocks while serving as an absurdist allegory of the excesses of the capitalocene, also comments on the animal's vulnerability under capitalism's sacrificial conditions. Eschewing the dangers however, of emptying the animal of critical potential by sublimating it to the status of iconicity, what Lippit calls the animal's "animetaphoricty" (195) in contemporary representational parlance, Ota's photo suggestively refuses the frontal and confrontational position, choosing to shoot the animal from the rear as it recedes and is subsumed into an uncertain but claustrophobic horizon. Here Ota subverts representational conventions and their categorical and taxonomic epistemes, by refusing the human spectator access to the animal's gaze which is diverted towards its own exploratory activity as it examines an object in its own field of vision and attention. If as John Berger laments that modern forms of visuality augmented by technological media like photography and cinema have in conjunction with extinction cascades and institutions of animal carceration like laboratories and zoos, by appropriating the animal's gaze and decimating its natural habitats, have rendered it empty, Ota's photos of animals in post-disaster spaces, challenge visual media's appropriative gesture by highlighting forms of nonhuman adjustment and negotiations with altered or destroyed ecologies, and transforming the photographic

[16] https://we-make-money-not-art.com/yasusuke_ota_the_abandoned_ani/ Accessed 2 December, 2022

surface into a shared affective space of mutual participation in what Jean Luc-Nancy calls the "equivalence of catastrophes."[17]

Thus images of pigs trying to cool off in a small puddle on a street, bulls occupying an empty parking lot outside a mall, abandoned pets in the midst of rubble and wreckage are not just melancholic evocations of pathos where spectatorial empathy occurs from a detached vantage of species difference and cognitive and linguistic advantage; rather the displacement and estrangement captured by these photographs perform the function of a Barthesian punctum– the accidental element in an image that stands out of its immediate denotative or referential context to assault and interlocute the viewer through the forceful transmission of a disorienting affect that brings to a crisis the viewer's cognitive limits, perceptual habits, and epistemological assumptions. (Barthes, 43) The anthropogenic accident of nuclear meltdown is transcribed in the photograph as a visually encoded figuration of the accidental as a form of dislocation and discrepancy that illuminates with urgent affective pressure the impossibility of a sanitized spectatorial vantage in an increasingly toxified and enmeshed world.

In the wake of the Fukushima disaster several animal advocacy groups like JEARS, ARK, KANSAI and Japan Cat Network volunteered to participate in rescue and care operations, often crossing into the radioactive zone illicitly carrying food, water and medical supplies for animals in distress. One such volunteer is Matsumura Naoto who has now returned to the evacuated area and has turned his home into a sanctuary for abandoned pets and livestock animals. In Ota's photographic series documenting the intimate relationship of caregiving and multispecies entangled inhabitation that has developed in Naoto's sanctuary that now houses not only rescued pets but also offers shelter and veterinary care to rehabilitated ostriches and cows, this question of enmeshment is visually dramatized. As in the case of Oldham's fallout dogs, human-animal relationships in these novel radioecologies are not constructed on old lines of proprietorial and possessive humanism– the dogs of Chernobyl or the cats and cattle of Fukushima are not pets or farm animals. The multispecies relationships that emerge in shared contexts of risk and exposure are characterised by unstable, contingent, mutating forms of encounter and cohabitation. The species divide that sustains the metaphysics of human exceptionalism at the core of capitalist will to mastery is no longer tenable under nuclear conditions where the scope of disaster cannot be entirely local or bounded by national borders but is symptomatic of the anthropocene's planetary inscription calling in turn for new post nuclear disaster imaginaries based in a recognition of the scalar dispersion and magnitude of exposures to risk.

5 Interrogating The Concept of Rewilding in Exclusion Zones

In Chernobyl Record, physicist R.F Mould describes the natural ecology of the exclusion zone as follows:

> The zone around the NPP, having minimal disturbance by humans, compared with former times, has now become, in effect, a wildlife

[17] Nancy, Jean-Luc, and Charlotte Mandell (ed.) *After Fukushima: The Equivalence of Catastrophes*. New York: Fordham University Press, 2014

> reserve with the wildlife populations increasing by 1998 by as much as a factor ten compared to the levels of 1986. Even a family of lynxes have been observed. The current population in what is a very ancient forest, is estimated to be 3000 foxes, 600 moose, 450 deer, 40 wolves and perhaps upwards of 3000 boars, which in the 1980s had been hunted almost to extinction because they were regarded as such a delicacy. (Mould, 184)[18]

The incidence of the flourishing of previously endangered animal populations in the depopulated radioactive zone has been observed across many studies leading to Chernobyl's iconic stature as one of the world's largest biodiversity sanctuaries. This trope of rewilding and reclamation of spaces by flora and fauna is further supported by studies on radiation hormesis that suggest that rather than causing cellular damage and chromosomal mutations, long term exposure to low doses of toxicity, including radioactive nuclides can build resistance to damage and disease. This theory has been challenged in recent times in studies that demonstrate the incremental and long-term effects of radiation exposure on animals. The most influential among these is the work of Timothy Mousseau and Anders Moller who have spent the past two decades studying ornithological records of radiation levels in the Exclusion Zone.[19] According to their ground-breaking findings, categories of health and normalcy when applied to animals living in radioactive territories need to be considered along expanded temporal scales since mutations and deformities have an intergenerational gestation period endangering the animal at a species rather than individual level. Their studies have identified barn swallows suffering from albinism and depigmentation as a result of the damage of melanocytes under the effect of radiation. The same swallows are found with deformed feet and toes, abnormally shaped feathers and multiple tumours sometimes measuring up to 0.5 inches in diameter, and cataracts or impaired vision that affect their flight behaviour leading to premature deaths.

Similarly in another study by Robert Baker of Texas Tech University bank voles are seen to have altered genomes as a direct result of living in close proximity to the region's highly radioactive soils and consuming toxic lichens that store concentrated amounts of radiation.[20] In their research on the ways in which radiation not only affects individual species but is magnified and protracted into what Mary Mycio calls "a state of being" so that the event of the nuclear disaster is no longer understood as a "state of shock" but seen as a "radioactive state never encountered in nature on such a scale before," Mycio and Rebecca Johnson study the ways in which radiation enters ecosystems through interlocking grids of interdependent relationships that structure them, making its way up the food chain and altering the very ontological constitution of particular ecologies. Thus while it may seem to the uninformed eye that "the zone's evacuation put an end to industrialization, deforestation, cultivation, and other human intrusions making it one of the Ukraine's environmentally cleanest regions" (Mycio, 32)[21] Chernobyl's soil with accumulated nuclear fallout washed into it by years of

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[18] R F. Mould, *Chernobyl Record: The Definitive History of the Chernobyl Catastrophe,* Bristol and Philadelphia: Institute of Physics Publishing, 2000

[19] see Møller et al. 2012; Møller and Mousseau 2009

[20] Chesser, Ronald K., and Robert J. Baker. "Growing Up with Chernobyl: Working in a Radioactive Zone, Two Scientists Learn Tough Lessons about Politics, Bias and the Challenges of Doing Good Science." *American Scientist,* vol. 94, no. 6, 2006, pp. 542–49. JSTOR, http://www.jstor.org/stable/27858869. Accessed 2 Dec. 2022.

[21] Mary Mycio,*Wormwood Forest : A Natural History of Chernobyl*. Washington, D.C.: Joseph Henry Press, 2005

radioactive rain continues to be highly toxic, with cesium 137 travelling through roots into plants and passing into the bones of animals where it is deposited so much so that "the bones of some large animal carcasses in the zone are so radioactive that some scientists prefer to wear gloves to handle them." (26) This radioactive contamination of the earth corroborates in turn Mousseau and Moller's observation about the near extinction of certain insect populations in the zone like spiders and red fire bugs that lay their doomed eggs in the soil.

These investigations of Chernobyl's radioecological forensics attest to the manner in which invisible and slow occurring subtexts of precarity and harm underlie the more utopian narratives of rewilding that often end up obscuring or minimizing the extent of ecological damage, subtexts which are slow to emerge and even slower to gain traction and attention because of the cultural marginality of the non-charismatic animal subjects: rodents, birds, insects, that bear the brunt of harm, but whose vulnerability and suffering remain unseen or unrecognized. Mayumi Itoh in her detailed investigation of the condition of animals during and after the Fukushima disaster, charts the nexus of lack of disaster preparedness, ambiguously conveyed evacuation protocols, and negligence on the part of the authorities led to a parallel silent catastrophe involving the 3500 head of cattle, 30000 pigs, 630000 chickens in addition to companion animals and heirloom horses trained for Shinto cavalry races, captive wildlife in Fukushima zoo and Tohoku safari park, that comprised a thriving livestock and urban and suburban animal population that had to be left behind, often tied to their posts. According to Itoh, "it is estimated that more than 22000 companion species and 660000 livestock died."[22] The Japanese national media and government authorities however initially chose to suppress this information underplaying the enormity of animal suffering in the disaster's wake. It is this silence that Ota seeks to address through his photography, responding as he says in an essay to a need to "inform the world and leave evidence of what really happened."[23]

6 Documenting the Zoopolitics of Disaster Zones in Pierpaolo Mittica's Photography

In the apocalyptic scenographies of Pierpaolo Mittica, photography acquires narrative dimensions as scenes of depletion, death, mourning, and exhaustion, human and nonhuman are mediated through, set against, and analogized in relation to an extended topology of disaster. Dramatic dark clouds, rocky and rugged terrain brought into sharp, almost three dimensional relief, architectural rubble, grain and dirt on the bodies and hazmat suits of clean-up workers, skeletal remains of dead animals and shadows and lines furrowing the contours of human skin, collectively constitute an embodied topography where the vestiges of radioactive contamination are inscribed photographically in the image's articulation of bodily duress and debilitation produced by living and labouring in toxic aftermaths of anthropogenic disasters. If the central paradox of photographing nuclear disaster is radiation's invisibility, in Mittica's photographs atomic invisibility is transcribed through a process of visibilizing other forms of invisibilization– of lives, labour, communities, and affects– under

[22] Mayumi Itoh, *Animals and the Fukushima Nuclear Disaster*, The Palgrave Macmillan Animal Ethics Series, 2018

[23] Ota Yasusuke, "One Man and His Cats in Fukushima (Photos)" Nippon.com, Jun 15, 2016, https://www.nippon.com/en/images/i00031/one-man-and-his-cats-in-fukushima-photos.html. Accessed 2 December, 2022

capitalism's construction of particular sensory regimes, that arbitrate upon which bodies, subjectivities, and experiences are recognized and allowed to enter the political and discursive field and which are allowed to fall beneath the threshold of semantic registration or coercively disenfranchised from systems of representation.

A particularly poignant image from Mittica's *Nuclear Trilogy* project is that of farm animals at their stations juxtaposed with long decomposed skeletal remains of their fellow creatures. A cow gazes piercingly into the camera, yet unlike Berger's characterization of the vacant look of the captured animal that has been denuded of all agency, here the image's pictorial language reanimates the creaturely look, but not as an anthropomorphic projection of sentimentalized emotion or an allegorical representation of "suffering" that normative ethicists like Peter Singer privilege as a mark of the animal's legal status and moral value. In the photo, the camera is placed low, almost at ground level, eschewing the human subject's bipedal and upright vantage and distending the frame to contextualize the lone animal in a wider matrix of entropy and loss. An off-centre and tilted perspective coupled with an eerie light seems to both bifurcate the scene and provide the flat pictorial surface with a depth that signals the image's location in time, informed by historical forces rather than being a mere snapshot of the animal as an object of visual consumption and commodification. This particular arrangement instead of petrifying the creaturely gaze liberates it as an affective vector– a disorienting and discomfiting charge that erupts while destabilizing existing modes of spectatorship. The animal's gaze brings our eye level to the ground where in a corner next to the live creature lie the bones of a dead one, its body still chained to the spot, suggesting a painful and protracted death by starvation while waiting to be rescued, that as scholarship on Fukushima's animals indicate was the shared fate of many.

Here the image generates its own interpretive conditions creating a visual idiom of mourning where grief is not a solely human emotion and acts of 'feeling' the animal's suffering are not based in a translation of animal affects from the perspective of human moral and ethical norms regarding the definition of what constitutes suffering. Instead, the photograph's proximity to death, decay, and survival as a set of material effects with which the image as a material object and photography as a cultural practice with ecological ties and implications, share a common ground, enables us to encounter nonhuman articulations of loss and grieving outside the semantic limitations imposed by anthropocentric rubrics. Loss is dispersed, much like radiation's scope, through the environment that the animal finds itself in, part of the fabric of a ruptured ecology. Mittica's image urges the viewer to consider death not just as an event that impinges on particular beings, and grief thus not simply as an emotion that is tied to particular constituencies, but as modes of inhabiting the absences and violations that accompany the loss of specific ecological possibilities: ways of living, relating to, cohabiting, making sense– that occur when entire ecosystems are endangered by anthropogenic calamities. In both this image, and a corresponding one that depicts an ostrich peering into the lens, its inquisitive gaze framed by its dead companion in the background, disaster's implications for animals is measured not just as what affects human-animal relations, but relations among animals as well. The heavily textured and delineated radioactive landscapes in Mittica's photos recalibrate the photograph as an extra-visual haptic and corporeal space, underscoring what Margaret Olin (2011) and Tina Campt (2017) refer to as the photograph's capacity to transcend a purely optical register and activate other sensory capacities in the viewer. By using the image to articulate a carnal politics that puts the finite, suffering, and malleable flesh to the centre of visual representation, Mittica's photos engage in what Beatriz da Costa and Kavita Philip (2010) call "tactical biopolitics," modes of activist and artistic

engagements with biopolitical enclosures and arrangements particularly those that involve the control of bodies reduced to a depoliticized and sacrificial animality. In these images of abandoned farms, life and death, fecundity and loss enter into what Agamben calls a zone of indistinction, those thresholds marking the limits of modern sociopolitical structures where life, extracted, articulated, and attributed in certain ways and in association with certain forms (of what Agamben calls zoe or bare life of the *homo sacer*– the dehumanized and excluded entity whose life in not being of the same valuable order as the qualified life proper to humanity is also outside the purview of death, and who can thus not be killed but be sacrificed without impunity) is inserted into a regime of death.

In a reworking of biopolitical critique, Nicole Shukin (2009) and Cary Wolfe (2012) have cautioned us, the tendency in postmodern philosophy to posit a common ground of animality as that part of life that is subtracted and excluded from the model of politically qualified life proper to humanity can run the risk of reducing the real flesh and blood animal to a metaphor for a debased and dehumanised figure as an instrument of the latter's desubjectivation. Within this schema the animal becomes instrumentalized as part of what remains despite its critical focus a patently anthropocentric semiotic structure. This in turn prevents us from gaining access to the ways in which animal bodies are invested, inscribed, and exploited by capitalism's necropolitical apparatuses: factory farms, testing labs, landfills, and the blasted landscapes that are left in the wake of radioactive, chemical, and other toxic industrial forms of ecocide. As Shukin elaborates, what is needed for biopolitical theory to be inclusive and aware of its own speciestic biases is:

> [A] different trajectory of biopolitical—or, we might say, zoopolitical—critique, one beginning with a challenge to the assumption that the social flesh and "species body" at stake in the logic of biopower is predominantly human. Actual animals have already been subtly displaced from the category of "species" in Foucault's early remarks on biopower, as well as in the work of subsequent theorists of biopower, for whom animality functions predominantly as a metaphor for that corporeal part of "man" that becomes subject to biopolitical calculation.[24] (9-10)

Mittica's documentation of radioactive landscapes foregrounds the ways in which seemingly isolated disaster scenarios in fact work in close conjunction with pre-existing structures of death and extinction, encoded in the very ways in which life as a site of extraction, colonisation, and control becomes the very ground where differential and exclusionary paradigms of recognition, conservation, and salvation are secured. While radioactive fallout's planetary reach is a scale or boundary defying hyperobject, toxicity's effects in relation to the unequal distribution of injury and harm within contemporary biopolitics are not uniform or universal.

7 Conclusion

What does rewilding look like in sites that are irreversibly irradiated by toxic substances? What behavioral patterns, ecological interdependencies, and modes of survival do animals in these regions adopt, especially where the very experience of

[24] Nicole Shukin, *Animal Capital : Rendering Life in Biopolitical Times,* University of Minnesota Press, 2009,

disaster not instantaneous or spectacular but a form of slow and incremental seepage of toxicity and harm, and where the dispersed and distended temporal scale occasions complex niches of pleasure, joy, playfulness and companionship between species consigned to a common horizon of damage, thus making clear cut divisions between doomsday scenarios and lively flourishing difficult to be drawn? The photographs explored in this paper attempt to engage these questions while also alerting us to the largely anthropocentric epistemic and juridical frameworks within which categories of suffering, precarity, victimhood, and debility are configured, frameworks in which visual mediums participate as producers and mobilizers of the discursive and semantic limits of what is seen and the ways in which viewing operates.

The three photographers and their diverse repertoires examined in this article, approach the common site of nuclear emergency and the shared question of visuality's relationship with nuclear modernity, via a range of styles, formats, and photographic principles, from documentary realism as in the case of Mittica and Ota's narrative exposition of ongoing practices of interdependence and care to Oldham's speculative worldbuilding. By juxtaposing them and reading their image making praxes, methodologies, aesthetics and politics comparatively, this article has attempted to highlight the provisional, open-ended, and contingent nature of multispecies coexistence in ecologies of damage and risk, while critically interrogating the participation of representational media as entangled with the very topographies they seek to witness, interpret, archive, and document– photography's specific epistemic modality as entwined with forms of immanent visuality configured by and in these emergent zones, be they biopolitical framings of animal life by dominant discourses or the kinds of possibilities for materialisation and intra-activity that the sites themselves afford. While Oldham's hybrid approach mixing documentary filmmaking and photography with fantasy and science fiction mise-en-scenes construct an imaginary of nonhuman agency that through its tongue in cheek, playful appropriation of culturally overdetermined tropes of heroism, conquest, mastery, and progress, offer an idiom of multispecies resilience that is at once decentered and cognisant of the role of mutuality, exchange, reciprocity, and mourning in sustaining the fragile bonds and communities that emerge in precarious landscapes, Ota and Mittica bring the suffering of animals to the forefront of photographic inquiry. The latter shifts the ethical force of affect particularly those affective conditions that hinge on loss, displacement, alienation, and violence, from their cultural location in an exclusively human capacity to feel to forms of nonhuman sentience and solidarities based on such nonhuman registers of testimony.

The disaster ecologies that thus emerge in Mittica and Ota along with Oldham's futuristic fictions of apocalypse complicate the anthropocentric narrative of nonhuman abundance in nuclear sites, while also questioning photography's own complicity as a historical medium of verisimilitude in the production and reproduction of such narratives. Through the insertion of experimental techniques, photomontage, comic and absurdist scenarios, discordant camera angles, extreme close ups, granularity and play of scales, all three photographers destabilize the medium's anthropocentric grounds, pointing to art's own unravelling as a cultural site of knowledge production under the effect of the Anthropocene's catastrophic conditions, and its entanglement with other human and nonhuman agencies, including radiation's particular inscriptional vector, in a planetary context.

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