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Animals and Climate Change

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1. Introduction

The standard story about climate change is that humans are the main causes of climate change and will also be the main victims. But nonhuman animals are central to climate change as well. In particular, farmed animals are major contributors to climate change, and climate change will be major contributor to wild animal suffering. As a result, I believe, we need to center farmed animals in our efforts to mitigate climate change, and we need to center wild animals in our efforts to adapt to climate change.

Both of these topics – farmed animals as causes of climate change, and wild animals as victims of climate change – are neglected, but the latter is especially neglected. I think that there are at least two reasons for this. First, whereas we have self-interested reason to care about farmed animals as causes, we do not have self-interested reason to care about wild animals as victims (except insofar as we benefit from the existence of wild animals). Second, whereas it is relatively clear how we should address the problem of farmed animals and climate change, it is not at all clear how we should address the problem of wild animals and climate change. Indeed, the problem of wild animals and climate change sits at the intersection of some of the hardest problems that we face in science and philosophy, and it is therefore not only especially important but also especially daunting.

My aim in this chapter is to examine the connections between animals and climate change from a primarily philosophical perspective. I will proceed as follows. In §2, I will show that industrial animal agriculture is responsible for anywhere from 18-51% of global human-caused greenhouse gas (GHG) emissions, and I will argue that, in light of these impacts, we have strong prima facie reason to center advocacy against industrial animal agriculture in our efforts to mitigate climate change. In §3-5, I will examine the impacts that climate change will have on wild animal populations, as well as the many scientific and philosophical questions that we need to ask in order to understand the moral relevance of these impacts. For example: Do wild animals have lives worth living? And what, if anything, do we morally and politically owe present and future generations of wild animals? Depending on how we answer these questions, our evaluation of the problem of wild animals and climate change will be very different.

To be clear, I will not attempt to answer all of these questions here. Instead, my aim is to start to unpack the relevant issues so that we can better appreciate the challenge that lies ahead. With that said, I will draw a provisional conclusion in §6, which is that we cannot wait for consensus about these issues to take action. In particular, there are at least two courses of action that we can and should pursue now independently of how we answer these other questions: First, we should study interventions in wild animal suffering so that we know how to help wild animals if and when the time comes, and, second, we should extend political status to wild animals so that we are capable of helping them if and when the time comes.

Before I begin, a quick note about the scope of this topic. While my focus here will be on farmed animals as causes of climate change and on wild animals as victims, we can, and should, also talk about farmed animals as victims of climate change and about wild animals as causes. For an example of the former, in fall 2016 Hurricane Matthew resulted in

flooding that killed millions of farmed animals in North Carolina alone.¹ And for an example of the latter, aquatic animals such as whales function as carbon sinks if they die of natural causes (since they sink to the bottom of the ocean, bringing stored carbon with them) and as carbon sources if we kill them (since we bring them to the surface, releasing stored carbon into the atmosphere).² There is much more to say about both of these topics, of course, but since the most important topics in this area are farmed animals as causes of climate change and wild animals as victims, these two will be my focus here.

2. Farmed animals and climate change

We know now that the climate is changing and human activity is changing it. The Intergovernmental Panel on Climate Change (IPCC) predicts that, between now and the end of the century, we will likely see a 2-4 degrees Celsius increase in global average temperatures above pre-industrial levels. There is also a small chance that a runaway effect will occur, causing as much as a 10 degree Celsius increase.³

Climate experts generally agree that a 5 degree increase would be catastrophic, and that a 10 degree increase would pose an existential threat to most sentient life on this planet. But even if we limit the damage to 2-4 degrees, climate change will have a massive and pervasive impact on this planet. It will cause melting ice caps, rising sea levels, flooding

¹ Tom Philpott, "Hurricane Matthew Killed Millions of Farm Animals in North Carolina," Mother Jones, URL: <http://www.motherjones.com/environment/2016/10/hurricane-matthew-killed-animals-hog-poop>; accessed October 14, 2016.

² Andrew J Pershing, Line B Christensen, Nicholas R Record, Graham D Sherwood, Peter B Stetson (2010), "The Impact of Whaling on the Ocean Carbon Cycle: Why Bigger Was Better," PLoS ONE 5(8): e12444. doi:10.1371/journal.pone.0012444

³ IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

coastal cities, an increase in the frequency and intensity of weather events such as hurricanes and tsunamis, regional conflicts over land, water, energy, and food, and more.⁴

What are we doing to cause all this harm? Mainly, engaging in activities that most people care a great deal about: reproduction and consumption. Consider reproduction first. In 1900, we had a global human population of about 1.5 billion. By 1950, we had about 2.5 billion.⁵ Now we have more than 7 billion and counting. Population experts estimate that we will likely have 9 or 10 billion humans on this planet by 2050, and 10 or 11 billion by 2100.⁶

Now consider consumption. Not only do we have more people, but these people are consuming more land, water, and energy than ever before. They are also consuming more animals than ever before. In particular, to feed even a fraction of the human population, we are currently farming a population of 20+ billion terrestrial animals at any given time, and using a substantial proportion of the land, water, and energy that we consume in order to sustain this population.⁷ Moreover, this population is increasing with each passing year, since developed countries are expanding into aquaculture and developing countries are seeing increased demand for animal products and adoption of industrial animal agricultural methods.

Needless to say, this global industrial animal agricultural system causes unimaginable pain and suffering for nonhuman animals.⁸ It also harms workers and results in substantial public health and environmental risks that are not directly related to climate change, ranging from mental and physical health impacts of animal waste seeping into the land and water near factory farms to the increased risk of a global pandemic as a result of antimicrobial use on

⁴ NASA, “The consequences of climate change,” URL: <http://climate.nasa.gov/effects/>

⁵ Michael Kremer, “Population Growth and Technological Change: One Million B.C. to 1990,” *The Quarterly Journal of Economics*, Vol. 108, No. 3 (Aug 1993), p. 683

⁶ Patrick Gerland et al, “World population stabilization unlikely this century,” *Science* 10 OCT 2014 : 234-237.

⁷ FAOSTAT, URL: <http://faostat.fao.org/beta/en/#data/QA>

⁸ See, for example, Peter Singer, *Animal Liberation* (Harper Perennial Modern Classics, 2009), Chapter 3.

factory farms.⁹ Thus, even if we set aside climate change, we have strong reason to promote abolition of industrial animal agriculture.

With that said, and most importantly for our purposes here, industrial animal agriculture is also a leading contributor to human-caused climate change. Specifically, industrial animal agriculture is responsible for an estimated 9 percent of human-caused carbon emissions, 37 percent of human-caused methane emissions, and 65 percent of human-caused nitrous oxide emissions.¹⁰ We should also note that while methane and nitrous oxide might not remain in the atmosphere as long as carbon, they trap heat more effectively than carbon while there. In particular, methane traps heat about 23 times as effectively as carbon and nitrous oxide traps heat about 296 times as effectively as carbon.¹¹

When you put these figures together, the upshot is that industrial animal agriculture is responsible for anywhere from 18-51% global greenhouse gas emissions. Why is this range so wide? The 18% figure comes from a 2006 FAO report¹² whereas the 51% figure comes from a 2009 World Watch report¹³, which purports to be less conservative and more comprehensive than the FAO report in several ways. For example, the World Watch report estimates that the global population of farmed animals is higher than the FAO report does, and it also considers a wider range of food-related activities as part of industrial animal agriculture than the FAO report does.

⁹ For discussion of impacts on workers, see Timothy Pachirat, *Every Twelve Seconds* (Yale University Press, 2013). For discussion of public health and environmental impacts, see Pew Commission on Industrial Farm Animal Production, *Putting Meat on the Table* (2008), URL = <http://www.pewtrusts.org/en/research-and-analysis/reports/2008/04/29/putting-meat-on-the-table-industrial-farm-animal-production-in-america>

¹⁰ Henning Steinfeld et al, *Livestock's Long Shadow*

¹¹ IPCC, *Climate Change 2001: Working Group I: The Scientific Basis*, "Chapter 6: Radiative Forcing and Climate Change." (Cambridge, UK: IPCC, 2007), as cited in Anna Lappé, *Diet for a Hot Planet* (Bloomsbury 2010), p. 255.

¹² Henning Steinfeld et al, *Livestock's Long Shadow*

¹³ Robert Goodland and Jeff Anhang, "Livestock and climate change," World Watch (November/December 2009), pp. 10-19.

Which report is more accurate? This is hard to say, but I think that the truth is likely somewhere in the middle, though closer to the World Watch estimate than the FAO estimate. Why? On one hand, the World Watch report is right to say that the FAO report is overly conservative (though it makes sense that the FAO would take this approach given their position in the conversation). On the other hand, some of the food-related activities that both reports list as contributors to climate change, such as deforestation, fossil fuel use, processing, and transportation, would likely occur with or without industrial animal agriculture. So if our aim is to compare emissions in a world with industrial animal agriculture with emissions in a world without it, then we should bracket emissions that would likely occur either way. To be clear, the authors of the FAO report do attempt to consider these counterfactuals in their calculations (so it may well be that we have no need discount in this direction at all), but of course a lot depends on what kind of food system we would replace industrial animal agriculture with, and how much industrialization this food system would involve.¹⁴

However, even if we accept the overly conservative FAO estimates for the sake of discussion, it still follows that industrial animal agriculture is responsible for nearly 1/5 of all human-caused greenhouse gas emissions. This is a massive contribution, and it will only increase as the human population increases and a higher proportion of people in developing countries produce and consume industrial animal products.

The moral upshot is clear. If we want to mitigate climate change as much as possible, then we must center advocacy against industrial animal agriculture in these efforts.

¹⁴ See James McWilliams, *Just Food* (Back Bay Books, 2010), for an argument that any realistic alternative to our current food system will have to preserve many of its industrial methods.

Unfortunately, the environmental movement has been slow to accept this idea.¹⁵ Why is that? There are many sources of resistance, ranging from historical tensions between the animal and environmental movements to personal reluctance to accept that we might have a moral duty to give up food that we like. Some people also have reasonable concerns about advocacy against industrial animal agriculture, though these concerns do not, I think, provide us with sufficient reason not to engage in this advocacy.

For example, consider one of the main concerns that people seem to have about a focus on industrial animal agriculture in the environmental movement, which is that it would risk alienating potential allies and suppressing movement growth. In particular, one might worry that even if eating animals contributes more to climate change than other activities do, people care about eating animals much more than they care about other GHG-emitting activities. After all, most of the people on this planet (and a vast majority of the people in the global 1%) eat animals every day, and many people also think of eating animals as a personal choice that they associate with deeply cherished cultural and religious practices and traditions that, they think, they have a right to preserve and protect.¹⁶ One might therefore worry that, if we center advocacy against industrial animal agriculture in our efforts to mitigate climate change, we risk doing more harm than good. Specifically, we risk causing people to think that environmentalism is incompatible with who they are and what they care about, and, as a result, we risk reducing our overall impact as a movement.

This is a reasonable concern. However, we can reply in at least two ways. First, we can question the idea that a focus on industrial animal agriculture would, in fact, alienate potential allies and suppress movement growth. Granted, if every environmentalist were to

¹⁵ See, for example, Kip Andersen and Keegan Kuhn, *Cowspiracy* (2014).

¹⁶ See Jonathan Safran Foer, *Eating Animals* (Back Bay Books, 2010), for discussion of this issue.

start throwing red paint on people at restaurants and supermarkets all the time, we would probably be inviting this risk. But of course, there are many other, much less alienating ways to advocate against industrial animal agriculture. For example, if we frame our message in terms of structural change, by saying that social, political, and economic structures are the problem and that social, political, and economic change is the solution, then we will be less likely to alienate people in the short term than if we frame our message in terms of individual change, by saying that individual producers and consumers are the problem and individual behavioral change is the solution. Moreover, to the degree that we do frame our message in terms of individual change, if we do so in a conciliatory way, for instance by promoting cage-free eggs and Meatless Mondays, then we will be less likely to alienate people in the short term than if we do so in a confrontational way, for instance by insisting that eating animals is always wrong (for people who have access to healthy, ethical alternatives). Does this mean that we should never engage in confrontational advocacy for individual change? Of course not. Indeed, we have good reason to think that, when certain conditions are met, this kind of advocacy can do more good than harm in the long run.¹⁷ Instead, what it means is that, to whatever degree we worry about alienating people in the short term, we can advocate against industrial animal agriculture in ways that do not invite this risk. By striking a good, strategic balance between different kinds of advocacy in different kinds of situation, we can preserve many of the benefits of a focus on industrial animal agriculture while minimizing many of the possible risks.

Second, we can also question the idea that, even if a focus on industrial animal agriculture *did* alienate people and suppress movement growth, then it would consequently reduce the overall impact of the environmental movement. Granted, a relatively large

¹⁷ See, for example, Erica Chenoweth, *Why Civil Resistance Works* (Columbia University Press, 2012).

environmental movement is better than a relatively small environmental movement all else equal. However, if some approaches to environmental advocacy are much more effective than others all else equal, then a relatively small environmental movement that centers the former, relatively effective approaches might be at least as effective, if not more effective, than a relatively large environmental movement that centers the latter, relatively ineffective approaches all things considered. And while a lot depends on the details, we have at least some reason to think that advocacy against industrial animal agriculture is much more effective than many other approaches to environmental advocacy all else equal, since the climate impact of industrial animal agriculture is not only an especially massive problem but is also an especially neglected and tractable problem.

To see what I mean, consider first how neglected this problem is. Animal Charity Evaluators (ACE)¹⁸ estimates that farmed animal charities currently receive a tiny minority of domesticated animal-related donations even though farmed animals experience the vast majority of all domesticated animal suffering.¹⁹ While less data is available on climate change-related donations, I think that we can safely assume that farmed animal charities also receive a tiny minority of climate change-related donations even though industrial animal agriculture is responsible for 18-51% of human-caused GHG emissions. If so, then that means that the marginal value of donating to a farmed animal charity, i.e. the value of each additional donation to such a charity, is higher than the marginal value of donating to many environmental charities from the standpoint of climate change mitigation. Similarly, consider how tractable this issue is. ACE estimates that we can save or spare at least one farmed animal per dollar donated to a farmed animal charity such as Animal Equality, the Humane

¹⁸ Disclosure: I am on the board of directors at ACE.

¹⁹ Animal Charity Evaluators, “Number of animals vs. amount of donations,” URL = <https://www.animalcharityevaluators.org/research/foundational-research/number-of-animals-vs-amount-of-donations/>

League, or Mercy for Animals.²⁰ If we then calculate how much GHG mitigation we can achieve per farmed animal saved or spared, we can combine these figures to estimate how much GHG mitigation we can achieve per dollar donated to a farmed animal charity. Of course, we would have to run these calculations separately for different kinds of farmed animal, as well as for farmed animals saved and spared. We should also allow for the possibility that the ACE estimates about the impacts of vegan advocacy are overly optimistic. Still, it seems plausible to me that, even if we were to make especially conservative assumptions about these impacts, our calculations would still show that we can mitigate climate change more effectively by donating to farmed animal charities than by donating to many environmental charities. I expect that similar conclusions would follow for how we spend our time and energy as advocates as well.

Of course, this is not to say that we should be spending all of the time, energy, and money that we allot for climate change mitigation on farmed animal advocacy. We would also need to consider other principled and pragmatic concerns about this approach to climate change mitigation, before reaching an all things considered conclusion about what to do. With that said, I do think that this discussion is enough to motivate the idea that, if we want to mitigate climate change as much as possible, then we need to center advocacy against industrial animal agriculture much more than we currently do in the environmental movement. Otherwise, even if we (miraculously) bring about a decrease rather than increase in human population, and even if we (miraculously) bring about a decrease rather than increase in other kinds of consumption, we will neither be addressing the main population crisis nor be addressing the main consumption crisis. To do that, we have to stop breeding farmed animals – or at least reduce the population of farmed animals so substantially that

²⁰ Animal Charity Evaluators, “Impact Calculator,” URL = <http://www.animalcharityevaluators.org/research/interventions/impact-calculator/>

animal products would become a rare luxury item from a global perspective – so that we can substantially reduce the amount of land, energy, and water that this industry consumes and the amount of carbon, methane, and nitrous oxide that it produces as well.

3. Wild animals, climate change, and a life worth living

How, then, will climate change affect wild animals? Climate change will radically alter global ecosystems, bringing about mass extinction and migration. Quadrillions, if not quintillions, of animals will suffer and die as a result. This raises, or at least amplifies, questions about duties of assistance to wild animals. However, before we can start to answer these questions, we need to consider, and bring together, a wide range of challenging questions. In what follows I will consider three related sets of questions – namely, questions about the idea of a life worth living (§3), about moral and political obligation (§4), and about duties to future generations (§5) – show how these questions interact, and show how our answers to these questions will shape our analysis of what, if anything, we owe wild animals in light of climate change. I will then close, in §6, by arguing that we cannot wait for consensus about these issues to take action, and by proposing two steps that we can take now that will make sense no matter how we answer many of these questions.

With that in mind, the first general question that we need to ask is: How will climate change affect the wellbeing of wild animals? This question has descriptive as well as normative aspects. Descriptively, we need to know: How will climate change affect the lives of wild animals? And normatively we need to know: What does it mean for life to go well or badly for wild animals? We can then put these judgments together in order to determine whether and to what degree climate change (as well as certain interventions in climate change) will make life better or worse for certain wild animals.

So how, factually, will climate change affect wild animals? There are many uncertainties here. However, we can make many predictions with some confidence. I will discuss two of them here. The first concerns biodiversity. In particular, we can predict that climate change will likely result in substantial biodiversity loss, “with the worst-case scenarios leading to extinction rates that would qualify as the sixth mass extinction in the history of the earth”.²¹ This will also make many ecosystems vulnerable to collapse. If we think that species and ecosystems have intrinsic moral value, then we might think that this effect is intrinsically bad.²² However, if we think that only sentient beings have moral status, then whether this effect is good or bad will depend on how it impacts individual animals. And of course, it is not necessarily the case that biodiversity loss will negatively affect individual wild animals on average or in total, since for every species that goes extinct, another might expand to take its place. Thus, we have to ask questions such as: Which kinds of animals will likely do well in a world with climate change, and which kinds of animals will likely do badly? And, do the kinds of animals who will likely do well tend to have better or worse lives, on average or overall, than the kinds of animals who will likely do badly?

The second prediction that I will discuss here, then, concerns which kinds of animals will likely do well in a world with climate change and which kinds of animals will likely do badly. Brian Tomasik, in a survey of the scientific literature on animals and climate change, notes that the kind of environmental instability that we can expect in a world with climate change tends to favor r-strategists (also known as r-selected animals) over K-strategists (also known as K-selected animals). What does this mean? Very roughly speaking, r-strategists are

²¹ Céline Bellard et al, “Impacts of climate change on the future of biodiversity,” *Ecol Lett.* 2012 Apr; 15(4): 365–377.

²² But see Dale Jamieson, *Ethics and the Environment*, Chapter 6, for discussion about how, even if we think that ecosystems have intrinsic moral value, it is hard to tell what counts as good or bad for them.

animals whose reproductive strategy emphasizes quantity over quality. They tend to have smaller bodies, they tend to have shorter lifespans, and they tend to have high reproduction rates and not invest a lot of parental labor into each baby, with the upshot that a relatively low proportion of their babies survive into adulthood. Insects and small rodents are r-strategists, for example. In contrast, K-strategists are animals whose reproductive strategy emphasizes quality over quantity. They tend to have larger bodies, they tend to have longer lifespans, and they tend to have low reproduction rates and to invest a lot of parental labor into each baby, with the upshot that a relatively high proportion of their babies survive into adulthood. Elephants and primates are K-selected animals, for example.²³

Why does environmental instability tend to favor r-strategists over K-strategists? Again, very roughly speaking, the answer is that smaller animals with shorter lifespans and higher reproduction rates tend to be more adaptable than larger animals with longer lifespans and lower reproduction rates. This means that, as climate change reshapes nature, we will likely see a higher proportion of smaller animals with shorter lifespans, higher reproduction rates, and higher rates of premature death, and a lower proportion of larger animals with longer lifespans, lower reproduction rates, and lower rates of premature death. Moreover, since r-strategists tend to require less space and fewer resources than K-strategists, we might see not only an increase in the ratio of r- to K-strategists but also an increase in the absolute numbers of r-strategists in the wild, and indeed in the absolute numbers of wild animals in general. Thus we will have to ask questions like: What kind of quality of life do r- and K-strategists tend to have, both in a world with and without climate change? This will help us

²³ Brian Tomasik, "Climate change and wild animals," *Essays on Reducing Suffering*, URL = <http://reducing-suffering.org/climate-change-and-wild-animals/> Tomasik discusses many other impacts that climate change will have on wild animals as well (including other impacts that will likely favor insect populations), but I will focus on the likely impacts on r- and K-selection here for the sake of simplicity.

determine for which wild animals these impacts will be good or bad, and it will also, as a result, help us determine whether these impacts will be good or bad for wild animals on average and overall.

Tomasik, for his part, is relatively pessimistic about quality of life for wild animals. He believes that most wild animals have bad lives and that most r-strategists have very bad lives.²⁴ Why? Because as much as we might like to think of wild animals as happy and free, the truth is that many if not most wild animals experience lives full of suffering as a result of hunger, thirst, disease, weather, predation, and more. This is especially true for many r-strategists (and, in particular, insects), since a high percentage of these animals experience a painful death as soon as they become capable of experiencing anything at all (assuming that they do experience anything at all, about which more in a moment). On this view, then, if climate change results in a higher proportion of r- to K-strategists in the wild, then it may well make life worse for wild animals overall, depending on the exact numbers.

I think that Tomasik is clearly right to challenge our tendency to assume that wild animals are happy and free, as well as our tendency to focus more on charismatic megafauna than on other animals (and especially insects) in our analysis. He *might* also be right to say that most wild animals have bad lives and that most r-strategists have very bad lives. However, there are many factual and normative issues that we need to address before we can determine if this analysis is correct. Here are three examples.

First, Tomasik believes that quality of life for wild animals depends on how much happiness and suffering they experience. However, we might question this claim. In particular, we might ask: Does the quality of my life depend only on subjective facts such as

²⁴ Brian Tomasik, “The importance of wild animal suffering,” Foundational Research Institute (2016), URL = <https://foundational-research.org/the-importance-of-wild-animal-suffering/>.

how much happiness or suffering I experience, or does it also depend on objective facts such as whether or not my life contains meaningful projects, relationships, and other such goods? We might also wonder what the baseline for a good life, i.e. a life worth living, is. Should we say that a good life is a life that contains more good than bad things (perhaps taking into account the order of good and bad things in that life)? Alternatively, should we set the baseline higher than zero, such that a life can be not worth living even if it contains more good things than bad? Or should we set the baseline lower than zero, such that a life can be worth living even if it contains more bad things than good?²⁵

What depends on these issues? Generally speaking, how we answer these questions will affect our thinking about which wild animals have good and bad lives, and this, in turn, will affect our thinking about the moral value of the impacts of climate change on wild animal populations. For example, a subjectivist about wellbeing might, like Tomasik, be relatively pessimistic about how good life can be for wild animals, since subjectivist theories allow for fewer ways in which a life can be good (as well as, admittedly, fewer ways in which a life can be bad). In contrast, an objectivist about wellbeing might be relatively optimistic about how good life can be for wild animals, since objectivist theories allow for more ways in which a life can be good (as well as, admittedly, more ways in which a life can be bad). Similarly, insofar as we establish a high baseline for a life worth living, we will, like Tomasik, think that a lower percentage of wild animals have lives worth living. Whereas insofar as we establish a low baseline for a life worth living, we will think that a higher percentage of wild animals have lives worth living.

Second, Tomasik believes that most wild animals, especially insects, have bad lives. However, we might question this claim as well. For example, we might question the claim

²⁵ See Ben Bradley, *Well-Being* (Polity Press, 2015) for discussion of different theories of wellbeing.

that insects have the capacity for wellbeing in the first place. Sure, we can be relatively confident that other vertebrates have the capacity for wellbeing, since other vertebrates are behaviorally, psychologically, and evolutionarily continuous with humans in respects that appear relevant to wellbeing.²⁶ But we might question whether invertebrates, and especially insects, have the capacity for wellbeing. After all, invertebrates such as insects are similar to us in many ways that appear relevant to wellbeing as well as different from us in many ways that appear relevant to wellbeing. And ultimately, we can never know what if anything it is like to be an insect, so we will always be at least somewhat uncertain about this issue.

Moreover, even if we grant that insects have the capacity for wellbeing (which, at the end of the day, I think we should), we might also question the claim that many wild animals, especially insects, have bad lives. Tomasik reaches this conclusion by asking if he would rather live as most wild animals or not live at all, deciding that he would rather not live at all, and concluding that life for most wild animals is not worth living.²⁷ But is this the right decision procedure to be using here? We might think that, in the case of vertebrates with clearly good or bad lives (for example, at the good end of the spectrum, my companion dog Smoky, and at the bad end of the spectrum, and most factory farmed chickens, cows, and pigs), our anthropomorphic perspective is reliable enough. But we might also think that in the case of invertebrates, as well as in the case of vertebrates without clearly good or bad lives, our anthropomorphic perspective is not reliable enough. Am I really prepared to say that a mouse, or for that matter a fly, has a bad life simply because I would rather not live at all than live as them? Then again, how else can I ask and answer this question but from my own

²⁶ See David DeGrazia, *Animal Rights* (Oxford University Press, 2002), Chapter 3, for discussion.

²⁷ Brian Tomasik, *ibid*

anthropomorphic perspective, together with all due epistemic humility and as much information as possible about the revealed preferences of wild animals?

Ultimately, no matter which theory of wellbeing we select, that theory will probably not provide us with certainty about which wild animals have good or bad lives. And if we cannot be certain which wild animals have good or bad lives, then we have no choice but to use principles of risk or uncertainty to think about this issue.²⁸ For example, we might consider using (a) a precautionary principle that tells us to err on the side of caution or (b) an expected value principle that tells us to multiply our degree of confidence that a particular animal has a good or bad life by the amount of good or bad life they would have if they did. In cases of uncertainty about whether or not a certain animal has the capacity for wellbeing at all, both of these principles would tell us to treat them as though they do, at least to a degree. However, in cases of uncertainty about whether a certain animal has a good or bad life in particular, it is less clear what these principles would tell us to do, since there are real risks either way. For example, if we err on the side of saying that animals have good lives in cases of uncertainty, then we risk false positives, i.e. we risk accidentally bringing about more animals with bad lives. Whereas if we err on the side of saying that animals have bad lives in cases of uncertainty, then we risk false negatives, i.e. we risk accidentally bringing about fewer animals with good lives. Thus a lot will depend on which of these risks we think is greater, as well as on what we think about the relative value of (a) bringing about good lives and (b) not bringing about bad lives. We will consider this issue below.

What depends on these issues? A lot. First, consider how much depends on our view about the scope of wellbeing in the world and, in particular, on our view about whether or not insects have the capacity for wellbeing. Scientists estimate that there are about 10 quintillion

²⁸ See Jeff Sebo, “The Moral Problem of Other Minds” (manuscript) for further discussion.

insects in the world at any given time.²⁹ It follows that if there is even a 1/1000 chance that the average insect has even 1/1000 the amount of wellbeing that the average primate does at any given time (which, in my view, is a conservative pair of assumptions), then the total amount of expected insect wellbeing in the world is equal to that of 10 trillion primates. Thus, the question whether and to what degree we include insects in the circle of moral concern will affect our moral calculations considerably. Indeed, depending on whether or not we accept an impersonal theory of wellbeing (which allows for aggregation across individuals), we may or may not think that the impacts of climate change for insects will be morally decisive. We will consider this issue below as well.

Now consider how much depends on our view about the distribution of wellbeing in the world and, in particular, on our view about the absolute and relative value of life for r- and K-strategists. To see how much depends on this, consider two (of many) possible scenarios. First, suppose that we estimate that all wild animals have bad lives, but that K-strategists have worse lives on average (because they have longer lives and more intensely negative experiences) and r-strategists have worse lives in total (because there are so many more of them). In that case an increased ratio of r- to K-strategists could make life better for wild animals on average but worse in total. Conversely, suppose that we estimate that all wild animals have good lives, but that K-strategists have better lives on average (because they have longer lives and more intensely positive experiences) and r-strategists have better lives in total (because there are so many more of them). In that case an increased ratio of r- to K-strategists could make life worse for wild animals on average but better in total. We will thus have to ask questions about whether average or total wellbeing is what matters, which we will do below as well.

²⁹ Encyclopedia Smithsonian, “Numbers of Insects (Species and Individuals),” URL = https://www.si.edu/Encyclopedia_SI/nmnh/buginfo/bugnos.htm

4. Wild animals, climate change, and moral and political obligation

A second general question that we have to ask, in order to understand what if anything we owe wild animals in light of climate change, is: What, if anything, do we morally and politically owe wild animals in general? For example, can we ever have a moral or political obligation to help them, or can we only have a moral or political obligation not to harm them? And, how if at all will climate change affect these moral obligations in practice?

Start with our moral obligations to wild animals. Of course, there are many possible accounts of what if anything we morally owe to wild animals. I will not be able to consider every possibility here, so what I will do instead is focus on how utilitarians and rights theorists might evaluate our moral duties to wild animals in light of climate change. (For the record, I will not be considering views according to which we have no moral duties to wild animals at all, since these views have straightforward – and, in my view, straightforwardly false – implications about what if anything we owe wild animals in light of climate change.)

Consider utilitarianism first. Utilitarians think that we have a moral duty to maximize positive wellbeing and minimize negative wellbeing for all sentient beings in the world. Thus, utilitarians think that we have a moral duty to help as well as not harm wild animals, provided that a policy of helping and not harming wild animals would do more good overall than other things that we could be doing with our time, energy, and money. In particular, then, utilitarians will ask three general questions about the possibility of providing assistance for wild animals.³⁰ First, what is the scale of wild animal suffering in the world? The higher the scale of this problem, the higher priority it will have for utilitarians. Second, how neglected is this problem relative to other problems? The more neglected this problem is, the

³⁰ See William MacAskill, *Doing Good Better* (Gotham Books, 2015) for discussion.

higher priority it will have for utilitarians. Third, how tractable is this problem relative to other problems? In other words, can we solve this problem effectively and efficiently, relative to other problems? Thus for utilitarians the main question is not (except perhaps indirectly): Am I complicit in the problems that wild animals face, and can I help wild animals while, at the same time, respecting their autonomy? Instead, the main question is simply: If I want to do the most good that I can, should I help wild animals?

So how will utilitarians answer these questions in the case of wild animals and climate change? With respect to scale, they will say that wild animal suffering is a high priority cause area with or without climate change, since anywhere from quadrillions to quintillions of sentient lives are at stake (though climate change will of course change the nature of this problem). With respect to neglectedness, they will say that wild animal suffering is a high priority cause area with or without climate change as well, since hardly anybody is working on it at all right now (even among people working on climate change in general). With respect to tractability, they will say that this remains to be seen. We can currently help wild animals in small-scale ways, for example through small-scale vaccination, assisted migration, population control, bio-engineering, or geo-engineering programs. But we are not yet capable of helping wild animals in large-scale ways, for example through large-scale versions of these programs (especially bio-engineering and geo-engineering programs). Thus a utilitarian will say that our focus in the short term should be on researching interventions in wild animal suffering. And then, if and when we have a clear sense of the tractability of this problem, we can decide what if anything we should do about it all things considered.

Are there limits to the ways in which we can be permitted or required to help wild animals according to utilitarianism? In practice, no. For example, if we determine that wild animals do not have lives worth living, then we might have a moral duty to ensure that fewer

of them exist in the future. Alternatively, if we determine that wild animals do have lives worth living, we might have a moral duty to ensure that more of them exist in the future. (We will consider these possibilities in more detail below.) Similarly, if we determine that wild animals do have lives worth living and that we can improve their wellbeing by interfering with their autonomy (for example by turning all of nature into an animal sanctuary), then we might have a moral duty to do exactly that. Of course, in practice, a lot depends on how confident we are about these judgments, as well as how confident we are about our ability to act on them. Again, caution is warranted. Still, the mere fact that utilitarians are open to these options in principle is noteworthy.

Now consider rights theory. Rights theorists think that we have a moral duty to treat all sentient beings not merely as means but rather as ends in themselves. (Again, I am focusing here on rights theories according to which wild animals have moral status. So I will be drawing less from rationalists like Immanuel Kant and more from sentientists like Tom Regan, Christine Korsgaard, and Sue Donaldson and Will Kymlicka.³¹) Thus, many rights theorists have argued that our primary moral duty to wild animals is to respect wild animal autonomy by simply letting wild animals be. Sure, we might have a moral duty to help wild animals sometimes, especially if we are responsible for their problems and if helping them is compatible with respecting their autonomy. But beyond that, we do not have a moral duty, or even a moral right, to play God with wild animals in order to improve their wellbeing. Thus for rights theorists the main question is not: If I want to do the most good I can, should I help wild animals? Instead, the main questions are: Am I responsible for the problems that wild

³¹ See, for example, Tom Regan, *The Case for Animal Rights* (The University of California Press, 2004); Christine Korsgaard, "Interacting with Animals: A Kantian Account," in Tom L. Beauchamp and R. G. Frey, eds., *The Oxford Handbook of Animal Ethics*. (Oxford University Press, 2011), pp. 91-118; and Sue Donaldson and Will Kymlicka, *Zoopolis: A Political Theory of Animal Rights* (Oxford University Press, 2011).

animals face, and can I help wild animals while also, at the same time, respecting their autonomy?

So how will rights theorists answer these questions in the case of wild animals and climate change? First, are we responsible for climate-related harm to wild animals in the relevant sense? This is a hard question to answer, because as with many collective action problems, we might think that we are collectively responsible for climate-related harm to wild animals (since we are collectively causing climate change, and climate change will harm many wild animals), but we are not individually responsible for climate-related harm to wild animals (since we are not individually causing climate change, but are rather only, at most, participating in our collectively causing it).³² Thus a lot will depend on whether or not rights theorists think that we have a collective duty to redress harms that we collectively cause, as well as an individual duty to participate in these efforts. If we do, then our complicity in climate change will undercut one traditional rights theoretic justification for non-intervention in wild animal suffering, which is that intervention counts as beneficence, and beneficence is not morally required. Why is that? Because if we are collectively responsible for climate-related harm to wild animals (as well as individually complicit in this harm), then our collectively intervening in climate-related harm to wild animals (and our individual participation in this intervention) is not beneficence at all, but is rather non-maleficence (insofar as our efforts are directed towards mitigation) or reparation (insofar as our efforts are directed towards adaptation).

Second, can we help wild animals compatibly with respecting their autonomy? Here a lot depends on what kind of intervention we have in mind. We can all agree that a policy of

³² For defense of this view, see Walter Sinnott-Armstrong, "It's not my fault: Global warming and individual moral obligations," in Walter Sinnott-Armstrong & Richard Howarth (eds.), *Perspectives on Climate Change* (Elsevier 2005). For critique, see Shelly Kagan, "Do I make a difference?" *Philosophy & Public Affairs* 39:2 (2011), 105-41.

helping wild animals by, say, turning all of nature into a zoo that keeps them all in solitary confinement would violate their autonomy in the relevant sense.³³ What about other, more realistic interventions in climate-related harm to wild animals, ranging from relatively modest interventions such as vaccination, population control, or assisted migration programs to relatively ambitious interventions such as bio-engineering or geo-engineering programs? Here a lot will depend on the details, and on what kind of autonomy we take wild animals to have.³⁴ With that said, if we think that we are already, through climate change, interfering in wild animal autonomy, then that will undercut another traditional rights theoretic justification for a policy of non-intervention in wild animal suffering, which is that intervention interferes with wild animal autonomy whereas non-intervention does not. After all, if we are already interfering with wild animal autonomy, then our choice is not between interference and non-interference, but is rather between interfering in a relatively harmful way and interfering in a relatively helpful way.

With that in mind, consider now our political obligations to wild animals. Since climate-related harm to wild animals is a global collective action problem that calls for a global collective action solution, and since the best mechanism that we have for global collective action solutions is, for better or worse, the state, it is now more important than ever that we start thinking seriously about what if anything we collectively, as a political community, owe nonhuman animals, including domesticated animals, liminal animals, and wild animals.

³³ Also, see Lori Gruen, “Dignity, captivity, and an ethics of sight,” in Lori Gruen (ed), *The Ethics of Captivity* (Oxford University Press 2014), pp. 241-7, for discussion about how captivity can violate the dignity of wild animals, in a sense of ‘dignity’ that utilitarians and rights theorists alike should care about.

³⁴ See Jeff Sebo, “Agency and moral status,” *Journal of Moral Philosophy* (forthcoming) for discussion of senses in which nonhuman animals, including wild animals, do and do not have autonomy.

With respect to this issue, the traditional view among liberals and conservatives alike has been that even if nonhuman animals have moral status, they do not (or should not) have political status, because only political agents can have political status, and nonhuman animals are not political agents.³⁵ However, in recent years many theorists have started to challenge this analysis. Why? Because many aspects of political status do not, in fact, require the kind of political agency that only adult humans can have. Granted, you might need the kind of political agency that only adult humans can have in order to hold public office, vote in an election, or participate in a jury. But you do not need this kind of political agency in order to enjoy many of the other benefits of collective self-government, such as the benefit of having your interests represented in the legislative process. Nor do you need it in order to assume at least some of the burdens of collective self-government, since one can assume at least some of the burdens of collective self-government without conceiving of oneself as doing so. This is why many political theorists now accept that severely cognitively disabled humans can have, and should have, political status for their own sake despite not having the kind of political agency that would permit them to, say, hold public office. And without leaning too heavily on this analogy, since there are of course many relevant differences that we must consider as well, this is also why many political theorists are now starting to consider the possibility that nonhuman animals can have, and should have, political status for their own sake despite not having this kind of political agency either.³⁶

Supposing, then, that nonhuman animals should have political status, what if anything should we politically do for wild animals in light of climate change? Sue Donaldson

³⁵ See Alasdair Cochrane, *An Introduction to Animals and Political Theory* (Palgrave Macmillan 2010) for discussion of why people from across the political spectrum have traditionally restricted political status to humans.

³⁶ See Sue Donaldson and Will Kymlicka, *Zoopolis: A Political Theory of Animal Rights* (Oxford University Press, 2011) for further discussion.

and Will Kymlicka have developed what is currently the most prominent account of what we politically owe wild animals in general, as well as when we have harmed them in particular.³⁷ With many caveats, they argue that we should extend our conception of citizenship (i.e. full membership in our political community) to domesticated animals, our conception of denizenship (i.e. partial membership in our political community and partial membership in their own political community) to liminal animals, and our conception of sovereignty (i.e. full membership in their own political community) to wild animals. On this view, then, we should think about our political duties to wild animals on the model of our political duties to other nations. So what do we owe other nations? Primarily, we should let them be. However, in cases of emergency, and especially in cases of emergency for which we are responsible, we have a duty to help them out. Thus, for example, many political philosophers think that if developed nations are disproportionately responsible for climate change and if developing nations will be disproportionately harmed by climate change, then developed nations have a duty to help developing nations adapt to climate change.³⁸ If we apply this model to wild animal communities, then, we might reach a similar conclusion: Primarily, we should let them be. But if human communities are disproportionately responsible for climate change and if nonhuman communities will be disproportionately harmed by climate change, then human communities have a duty to help nonhuman communities adapt to climate change.

Of course, the idea that we might have a moral or political obligation to help wild animals adapt to climate change will raise concerns about the demandingness of such a policy. (In particular, for utilitarians it might raise questions about what else we could do with this time, energy, and money, and for rights theorists it might raise questions about

³⁷ *ibid*

³⁸ See Henry Shue, "Global environment and international inequality," *International Affairs* 75:3 (1999), pp. 531-45) for an argument for this conclusion.

whether a policy this demanding could possibly be morally required in the first place.) After all, to the degree that we extend moral and political status to nonhuman animals, the class of moral and political agents, i.e. those of us who have moral and political duties, will be much smaller than the class of moral and political patients, i.e. those of us who have moral and political rights. So, we will have to decide how willing we are to accept a conception of private and public morality according to which the vast majority of the burdens will flow to humans and the vast majority of the benefits will flow to nonhumans, in practice. Indeed, we might even wonder whether such a situation is compatible with what Hume, and then Rawls, called “the circumstances of justice,” i.e. the circumstances in which justice is possible and necessary to try to achieve.³⁹

These concerns about demandingness are reasonable. However, it would be premature to dismiss the idea of helping wild animals adapt to climate change on the basis of these concerns at this point. After all, even if we think that there are limits to how demanding morality can be, we might think that at least some self-sacrifice is called for in a situation in which potentially quintillions of lives are at stake as a result of our activity. Also, even if it would be excessively demanding for us to help wild animals in some ways at present, it might not be quite as excessively demanding for us to help them in other ways and/or in the future, especially once we have new interventions in wild animal suffering and new social, political, and economic systems for implementing them. Thus, for example, if we focus on studying new forms of co-existence with wild animals and on extending political status to them right now, we might find that we can help them in part simply by considering their interests as we work to recreate our own communities to cope with climate change later on.

³⁹ David Hume, *An Enquiry Concerning the Principles of Morals* Section III Part 1 (Oxford: Oxford University Press, 1998) and John Rawls, *A Theory of Justice: Revised Edition* (Cambridge: Harvard University Press, 1999).

5. Wild animals, climate change, and duties to future generations

A third general question that we need to ask, in order to understand what if anything we owe wild animals in light of climate change, is: What, if anything, do we morally and politically owe future generations of wild animals in general? This is important because climate change will disproportionately impact future generations of wild animals. So what if anything we owe wild animals in light of climate change will depend in part on what if anything we owe future generations of wild animals in general. With that in mind, consider three related questions in creation ethics, population ethics, and duties to future generations that will be relevant to this discussion.

First, do we have equally strong reason to create good lives and prevent bad lives? Or do we have stronger reason to prevent bad lives than we have to create good lives?

As we have seen, different philosophers might answer this question in different ways.⁴⁰ For example, utilitarians will say that we have equally strong reason to create good lives and prevent bad lives in principle. What matters is that we do the most good that we can; whether we accomplish that goal by, in some cases, actively or passively adding positive value to the world and, in other cases, actively or passively subtracting negative value from the world is not in and of itself morally significant. However, utilitarians may or may not think that we have equally strong reason to create good lives and prevent bad lives in practice. For example, if a particular species is at risk of overpopulation (with the result that many members of this species will experience increased suffering and premature death), then we may or may not think that the value of preventing bad lives is greater than the value of creating good lives in this case in practice. In contrast, if a particular species is at risk of

⁴⁰ See Shelly Kagan, “Singer on killing animals,” in Tatjana Višak and Robert Garner (eds), *The Ethics of Killing Animals* (Oxford University Press 2016), pp. 136-53 for discussion.

extinction (with the result that they will increase the risk of ecosystem collapse, with negative impacts for many other animals), then we might think that the value of creating good lives is greater than the value of preventing bad lives in this case in practice. And of course, we will likely deal with both of these scenarios with certain species moving forward. So, the question of whether and to what degree we should actively increase or decrease certain wild animal populations will be complex for utilitarians.

In contrast, many rights theorists will say that we do not have equally strong reason to create good lives and prevent bad lives in principle. Instead, we have stronger reason to prevent bad lives than we have to create good lives. Why? Because creating good lives counts as a benefit, and therefore as beneficence,⁴¹ whereas preventing bad lives counts as preventing a harm, and therefore as non-maleficence (at least in cases where we would have been responsible for this harm). And rights theorists think that while we have a perfect, i.e. exceptionless duty to prevent harms that we would have been responsible for (within certain limits), they think that we have only an imperfect duty to produce benefits. Of course, this does not mean that rights theorists will say that we should actively decrease certain wild animal populations, since they might think that this kind of population control constitutes an impermissible interference in wild animal autonomy (though we raised questions above about whether or not a rights theorist should continue to accept this idea in a world reshaped by climate change). However, it does mean that, if the choice is between (a) allowing the number of bad wild animal lives to decrease (with the foreseeable result that we would be allowing the number of good wild animal lives to decrease as well) and (b) allowing the number of good wild animal lives to increase (with the foreseeable result that we would be

⁴¹ Though see David Benatar, *Better Never to have Been* (Oxford University Press 2006) for an argument that whereas creating bad lives counts as a harm, creating good lives does not count as a benefit.

allowing the number of bad wild animal lives to increase as well), rights theorists will likely choose the former option all else equal. Will they choose this option all things considered? That depends on many other issues, for example on whether or not we are responsible for the relevant population trends, and, if we are, on whether or not population control efforts would still count as beneficence.

Interestingly, many utilitarians now claim to value preventing harms more than promoting benefits as well. In particular, negative utilitarians believe that we have stronger moral reason to actively or passively prevent negative wellbeing than we have to actively or passively promote positive wellbeing. Thus, if the choice is between (a) causing or allowing the number of bad wild animal lives to decrease (with the foreseeable result that we would also be causing or allowing the number of good wild animal lives to decrease) and (b) causing or allowing the number of good wild animal lives to increase (with the foreseeable result that we would also be causing or allowing the number of bad wild animal lives to increase), negative utilitarians will likely choose the former option all else equal. Should they accept it all things considered? I think it depends on the sense in which they think that harms matter more than benefits. If they think that harms matter more than benefits in *theory*, then, yes, they should perhaps accept this result. However, if they merely think that harms matter more than benefits in *practice*, since we tend to see diminishing returns when we focus on making happy people even happier, then I think they should consider making an exception in this case. After all, in this case a commitment to negative utilitarianism might lead to a practice of passively allowing, if not actively causing, mass extinction for many if not all wild animal species. With that much at stake, it is worth pausing to ask if our reasons for prioritizing harms over benefits in most cases apply in this case as well.

The second question concerning our duties to future generations to wild animals, which is related to the first, is this: Do we have equally strong reason to create all good lives, or do we have stronger reason to create better good lives than worse good lives?

This question raises what Derek Parfit calls the non-identity problem.⁴² Roughly speaking, the non-identity problem works as follows. Many of our choices will affect not only the quality of life but also the identity of future individuals. Thus, for example, suppose that we have two policy options: A and B. If we select option A, that will bring about one population of individuals (population A) who have lives very much worth living (for example, maybe their pleasure to pain ratio is 10:1). Whereas if we select option B, that will bring about another population of individuals (population B) who have lives at least somewhat worth living (for example, maybe their pleasure to pain ratio is 10: 9). Intuitively, if we bring about population B instead of population A, we cause harm, and therefore we act wrongly, all else equal. But who are we harming? Not population B, since this is the only future in which they can exist at all. So, our challenge is to either show how option B causes harm, and therefore that we act wrongly in selecting this option all else equal, or accept that it does not cause harm, and therefore that we do not act wrongly in selecting this option all else equal.

Can we solve the non-identity problem? Some philosophers think that the answer is no. As long as everyone in the future has a life worth living, it is not worse to bring about individuals with lower wellbeing than individuals with higher wellbeing. Other philosophers think that the answer is yes. On impersonal views (the kinds of views that utilitarians tend to accept), the solution is that option A will result in higher levels of wellbeing than option B, independently of who experiences that wellbeing. On person-affecting views (the kinds of

⁴² Derek Parfit, *Reasons and Persons* (Oxford University Press, 1986), pp. 351-377.

views that rights theorists tend to accept), the solution is that certain individuals in population A function as counterparts to certain individuals in population B, and so we can compare good lives across possible futures for purposes of assessing harms and benefits.⁴³ We will not be able to resolve this debate here. But note that, if we want to claim that climate change will harm future generations of humans (even if these humans will still have lives at least minimally worth living), then we will have to find a solution to this problem that will likely work for nonhumans as well.

How much depends on whether or not we can solve the non-identity problem? As I indicated a moment ago, how much this issue matters will depend on how we answer some of the other questions that we have asked here. For example, if we select utilitarianism as our theory of moral obligation, then the non-identity problem will not be a problem for us, since we will already accept a theory of wellbeing that allows us to compare good lives across possible futures. Whereas if we select rights theory, then the non-identity problem will, at least on the face of it, be a problem for us, since we will, at least on the face of it, accept a theory of wellbeing that does not allow us to compare good lives across possible futures (though as I have indicated, many rights theorists are working on solutions to this problem). It also depends on where we set the baseline for a life worth living. Why? Because insofar as we think that wild animals do not have lives worth living, the non-identity problem will be less of a problem, since we can say that creating bad lives will cause harm whether or not we can say that creating good lives (instead of great lives) causes harm. However, insofar as we think that wild animals do have lives worth living, the non-identity problem will be more of a

⁴³ See, for example, Tatjana Višak, “Do utilitarians need to accept the replaceability argument?” in Tatjana Višak and Robert Garner (eds), *The Ethics of Killing Animals* (Oxford University Press 2016), pp. 117-35 for discussion.

problem, and we will have to try to find a solution that works for future generations of human and nonhuman animals alike.

The final question concerning our duties to future generations of wild animals that we will consider here (though there are many others as well) is: Does average or total wellbeing matter more?

Of course, ideally we can bring about a future with increased average and total wellbeing for wild animals. But suppose that we have to choose between these outcomes. Either way we run into seemingly implausible results. On one hand, if we say that total wellbeing matters more than average wellbeing, then we seem to be committed to the idea that a world with, say, 10 quintillion “happy insects” (each of whom, we can assume, has a life containing one unit of wellbeing) is better than a world with, say, 10 billion happy, flourishing humans (each of whom, we can assume, has a life containing one million units of wellbeing). Why? Because the insect world would contain 10 quintillion ($1e+19$) units of wellbeing overall, whereas the human world would contain only 10 quadrillion ($1e+16$) units of wellbeing overall.⁴⁴ On the other hand, if we say that average wellbeing matters more than total wellbeing, then we seem to be committed to the idea that a world with, say, 10 billion happy, flourishing humans is better than a world with 10 billion happy, flourishing humans *and* 10 quintillion happy insects. Why? Because the average quality of life in the human-only world would be much higher than the average quality of life in the human and nonhuman world. Intuitively, many of us want to reject both of these commitments. This raises the question: Which, if either, should we reject, and why?

What should we do about this situation? For some philosophers, the solution is to accept one of these conclusions, no matter how implausible it may appear to be. For example,

⁴⁴ See Derek Parfit, *Reasons and Persons* (Oxford University Press, 1984), pp. 381-387 for discussion of this kind of issue.

total utilitarians (the more common type) think that we should accept that total wellbeing matters more than average wellbeing (and therefore that a world with 10 quintillion happy insects is better than a world with 10 billion happy humans all else equal), and average utilitarians (the less common type of utilitarian) think that we should accept that average wellbeing matters more than total wellbeing (and therefore that a world with 10 billion happy humans is better than a world with 10 billion happy humans and 10 quintillion happy insects all else equal). For other philosophers, the solution is to reject the reasoning that leads to both conclusions, sometimes in ways that concern other issues that we have discussed here. For example, if we raise the baseline for a life worth living, then perhaps we can say that these insects are “sad” rather than “happy” and that their lives are adding negative rather than positive value to the world. Of course, we might still face a version of this problem with other kinds of animal in this scenario. For example, even if we are no longer committed to the idea that a world with 10 quintillion insects is better than a world with 10 billion humans, we might still be committed to the idea that a world with, say, 10 quadrillion *squirrels* is better than a world with 10 billion humans. But maybe this bullet is at least a bit easier to bite. (If the squirrels currently living on my windowsill are any indication, for example, a world with 10 quadrillion happy squirrels seems like a pretty good world to me.)

How much depends on whether or not we can avoid these conclusions? Again, it depends on our answers to some of the other questions that we have considered here. For example, if we think that climate change will either increase or decrease average *and* total levels of wellbeing in the wild, then we are less likely to face these issues in the real world. On the other hand, if we think that climate change will increase total levels of wellbeing while decreasing average levels of wellbeing in the wild (or vice versa), then we are more likely to face these issues in the real world, and so it will matter whether or not we have a way out. And recall that we earlier considered plausible scenarios in which climate change

could push in either direction. Thus, for example, if we think that total wellbeing is what matters and that a climate change-induced increase in the proportion of r- to K-strategists in the wild will increase total wellbeing in the wild, then we may be committed to the idea that a climate change-induced increase in the proportion of r- to K-strategists in the wild is good all else equal. Alternatively, if we think that average wellbeing is what matters and that a climate change-induced increase in the proportion of r- to K-strategists in the wild will decrease average wellbeing in the wild, then we may be committed to the idea that a climate change-induced increase in the proportion of r- to K-strategists in the wild is bad all else equal. Meanwhile, different combinations of answers will yield different evaluations of the impact climate change will have on wild animals – and what if anything that we owe wild animals in light of these impacts.

6. Conclusion

My aim in this chapter has been to survey some, but not remotely all, of the connections between nonhuman animals and climate change, as well as some, but not remotely all, of the scientific and philosophical questions that we must ask in light of these impacts. I have not, of course, attempted to answer all of these questions here, though I did come closer to doing that in the case of farmed animals than in the case of wild animals.

In the case of farmed animals: Since industrial animal agriculture is a leading cause of climate change, we should center advocacy against industrial animal agriculture in our efforts to mitigate climate change. The question is whether and how we can do that in an ethical and effective way. I have indicated why I think we can move in this direction without alienating potential allies and doing more harm than good, but much more needs to be said before we can fully evaluate this approach to environmental advocacy.

In the case of wild animals: If climate change will be a leading cause of harm to wild animals in the future, then we should center consideration of wild animals in our efforts to adapt to climate change. How should we do so in particular? We will need to make more progress on the many issues that we have considered here before we can say for sure. However, I think that we can draw two general, provisional conclusions for now.

First, we cannot wait for consensus about the many issues that we have considered here in order to take action. We may never achieve consensus about these issues, yet the fact remains that climate change will have an increasingly massive and pervasive impact on all sentient life on this planet with each passing decade. We need to confront that reality now, whether or not we remain uncertain about some or all of the relevant issues. Otherwise we will be no better, with respect to animals and climate change, than the many politicians who say, “We need another decade of research before we can justify taking action” are with respect to climate change in general.

Second, as we have seen, there are at least two general courses of action that we can take now that will make sense no matter how we answer many of the questions that we have asked here. First, we can make epistemic progress by researching what we should aim for and how we should aim for it. Should we resist or embrace the impact that climate change will have on wild animal populations, and, either way, how can we help surviving animals to flourish as much as possible? And, second, we can make practical progress by advocating for moral and political status for all sentient beings, so that we will have the social and political will necessary for taking the interests of wild animals into account as we recreate human societies in the face of climate change. If we take these steps now, then we will be more likely to know what to do and be able to do it when the time comes – no matter what that happens to be.