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Human Impact on Global Extinction

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Human Impact on Global Extinction

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Abstract

For this project, I wanted to look at how heavily humans are impacting the current rate of global extinction. Many scientists and experts believe that Earth is either on the brink of experiencing a sixth mass extinction or that it is already occurring. The rate of extinction is argued to be happening at a much faster rate than during the Earth's five previous mass extinctions which were before the evolution of humans. This project explores the different ways that humans are impacting global extinction, between a significant contribution to global warming, poaching, deforestation, and other factors. There is a limited amount of time left to try and reverse the effects humans have had on the rate of global extinction, and this project will also look at the different ways that humans can try and slow the global extinction rate.

When most people think of wildlife, they think of lions, zebras, and tigers in their natural habitats, out in the rainforest or in the African savanna. They may think of forests thick with trees and fields of flowers, flowing bodies of water, and places to travel to for the scenery. Many people's favorite activities include visiting a zoo and getting to see so many interesting, wild creatures up close, or going to the beach and fishing off of the coast. It is true that our world's wildlife should be regarded as valued and left untouched as it was when we found it, but as time goes on, nature has become something else entirely. In the last century, our planet has seen a striking increase in our wildlife that are dying out of existence, and it has sparked a conversation among scientists and experts about how it could be happening. In the past, there have been several of mass extinctions that have left the earth with a small fraction of the plant and animal species that it had before, but this was all before the evolution of humankind. While the five mass extinctions we have seen in history have gone underway as a result of adverse climate changes and naturally-occurring events, there is a chance that planet Earth is experiencing its sixth mass extinction, or at least on the brink of reaching it, and humans seem to be the main culprit for the heaviest impacts. Many of the beautiful, wild animals that inhabit our planet are at high risk of being forced out of their environments and possibly becoming extinct. Many of these animals are being hunted to extinction for the sake of entertainment and profit. Forests and natural areas are being torn down and destroyed to make room for the growing human population, and there is only so much space on earth to accommodate for them.

Many scientists and experts are saying that the rate of global extinction is even faster than the background rate of extinction our environment has seen in the past – this is why much of the focus on reducing the weight of these impacts is on humans, but we are not doing an efficient

job. Some of the greatest impacts that our environment is currently seeing is a rapid increase in global warming and the destruction of many of our wildlife's natural environments. The disturbance of ecosystems and food webs within the environment are negatively affecting the earth's rich biodiversity which humans, whether they recognize it or not, are highly dependent upon. The constant and abundant emissions of toxic greenhouse gases are one of the main contributors to the increasing rate of extinction all around the globe, and the gradual rise of temperatures are making it incredibly difficult or even impossible for many animal and plant species to survive in their natural environments. While some greenhouse gases have always been a natural part of the atmosphere, the incredible influx of these gases that are trapping heat within our planet is happening so quickly that many of these animals are not able to adapt to the changes and find sustainable, suitable homes. Each individual species of plant or animal has a specific environmental range that they are adapted to – without being given a significant amount of time to evolve and adapt to new conditions, it is nearly impossible for any species to be able to survive outside of their range. When one species is taken out of its unique ecosystem, the livelihood and welfare of the other animals within that ecosystem will be affected, putting any animal or species within that environment at risk of becoming endangered or even extinct. There are a number of things that we can do as individuals to try and alleviate the situation and put our planet in a better position for the future, such as conserving energy, educating ourselves on environmental issues and concerns, and changing small details about how we live our daily lives that require little to no extra effort or expense. Ideally, in order to make major changes within our environment would require national and global support, and that may be part of the reason why the United States, and even the world as a whole, has not been able to make any significant progress pertaining to global extinction.

At the rate humans are going, wildlife is being decimated faster than we can truly recover. Actions that humankind are taking every day are leaving our wildlife at risk, and it is only predicted to grow exponentially worse and more dangerous for our planet if we continue to go uninformed on the topic and what we are able to do to collectively start making noticeable changes. The purpose of this project and research is to compare the effects that impacted global extinction in history versus the effects that are having an impact on global extinction today and how much of that impact can be traced back to human fault. It is important to acknowledge all of the actions that are being taken that in some way either directly affect the sustainability of our wildlife and how humans are adding to the problems in a number of indirect ways, as well. When more people are aware of what measures they are capable of taking as well as what the potential consequences are if we continue to ignore the growing issue, there is much more room for opportunity to reduce our negative influence and alleviate the harmful impacts that have already happened.

The growing number of animal and plant species that are at risk, threatened, and being decimated to irreversible extinction is a very troubling concern that environmentalists, scientists, ecologists, and experts of all kinds are trying to bring more attention to in order to mitigate the negative effects that are impacting our natural environment. The crisis of global extinction is not something that is often talked about because most people do not understand the importance of biodiversity within our environment and how it not only affects the plants and animals on our planet, it also affects the humans that are largely at fault. One of the most notable reasons that we have not seen much progress in protecting our environment from global extinction is simply because humans do not see how it can feasibly affect them or how making an effort to give back

to the environment could benefit them. Unfortunately, especially in the United States, the opportunity of making a profit off of something almost always outweighs the environmental risks, and often times, the risks are not considered at all. The Millennium Ecosystem Assessment in 2005 examined the connection between the wellbeing of humankind and the existence of biodiversity – this assessment discovered that there are benefits to humans from rich biodiversity in “material welfare, security of communities, resilience of local economies, relations among groups in communities, and human health” (Cresswell & Murphy, 2016). Many people do not realize just how dependent that the human species is upon a healthy ecosystem and the services it provides to them, such as the availability of fresh water, the fertility and stability of soil, pollination, food and medicine – the loss of biodiversity within any given ecosystem can lead to the lack of these services (Shaw, 2018). Some of the loss of biodiversity has put the sustainability of the world’s most important pollinators, bees, at high risk. In 2018, it was observed that bee populations were extremely decimated, and much of this was attributed to toxic pesticides and the loss of their habitats. Bees are incredibly important to nearly every ecosystem because bees are one of the most predominant pollinators that earth has – without bees to pollinate the extensive number of crops and flowers that they normally tend to, there could potentially be a shortage of crops for humans and resources that are used to feed livestock.

An increase in urban developments and invasive farming methods has meant that many of the areas bees once called home no longer exist. These developments are as much a threat to bees as they are to trees and woodland. In the wild, several species of bee nest in hollow trees, so as more trees are destroyed so are the homes these bees live in.

Wildflower meadows and other areas abundant in flowering plants are also in serious decline, meaning that bees lose an important food resource. (Vickers, 2018)

“The destruction of forest ecosystems is responsible for 11 percent of all global greenhouse gas emissions caused by humans, so conserving forests would stop the release of these gases into the atmosphere” (Shaw, 2018). The availability of diverse, natural environments globally has the capacity to regulate or mitigate climate change and keep excess carbon emissions from being released into the environment – plants and trees absorb a lot of carbon dioxide that is released into the air, and it helps protect the environment from excess emissions.

As stated before, humans are incredibly reliant on the availability and consistency of a healthy, diverse natural ecosystem. Every species of plant or animal has its own place or niche within its habitat, and humans are directly or indirectly affected by each species that is taken out of its natural environment, whether the impact seems small or significant. “Different organisms are responsible for controlling invasive or pest species, maintaining soil fertility, pollinating and thereby maintaining diverse vegetation, purifying air and water, detoxifying and decomposing wastes, and regulating climate” (What Can We Do). Locally, nationally, and globally, it is crucial that communities start taking notice to how harmful these effects are and how dire it is that we take care of our wildlife – without the collective effort of humankind, the consequences will only continue to grow more dangerous. Many people are under the impression that taking care of the environment and implementing long-lasting programs and plans to improve the sustainability of our planet’s wildlife is not worth the expenses it may require, but what many people fail to recognize is that much of the world’s economy is dependent on biodiversity, as well. A minimum of 40% of the global economy is derived from biological resources, and if biodiversity continues to diminish at its current pace, food industries as well as commercial forest and ecotourism industries risk losing \$338 billion every year (Shaw, 2018). This is more relative to developed nations, but the loss of biodiversity may be even more traumatic for

countries that are less developed and rely even more heavily upon the availability of biodiversity for their food and resources. The tourism and recreation industries also stand a lot of economic risk at the current rate of the loss of biodiversity – when natural areas continue to be decimated at an increased pace, there will be a limited amount of parks and facilities that support natural wildlife available for people to visit and experience. These areas often provide education to its visitors about wildlife and help people find a connection between themselves and the importance of wildlife. An increasing loss of biodiversity also affects the culture of so many different areas that are highly valuable to its people. “All major religions include elements of nature and 231 species are formally used as national symbols in 142 countries. Unfortunately, more than one-third of those species are threatened” (Shaw, 2018). As time passes, there is more and more of a critical need for humans to start taking action to renew the biodiversity within their communities. Nature is so seldom regarded as what it is – nature, not profit. Education around these environmental issues is important, and some of the most effective steps that an individual can take to help restore the loss of biodiversity is to continue to support natural areas, planting trees and flowers, using more natural products that will lessen any toxic waste being drained into the environment, and leaving as much natural land as possible undisturbed.

The rate at which our planet is experiencing a devastating decrease in biodiversity has many scientists fearing that Earth is undergoing our sixth mass extinction in history, the most recent one having taken place approximately 66 million years ago. There is debate over whether our planet is currently experiencing the sixth mass extinction or not, but there is no negotiation about how close we are to the edge. “According to a recent poll, seven out of ten biologists think we are currently in the throes of a sixth mass extinction. Some say it would wipe out as many as

90 percent of all species living today” (Simberloff, 2000). There is a growing concern that the global extinction we may be currently experiencing is at a rate that is even more severe than the five prior mass extinctions that our planet has faced. Previous mass extinctions were resulting from several different events, such as an ice age, volcanic eruptions, climate changes, and an asteroid. All of these mass extinctions were before the time of human evolution, and it has led scientists and experts to question if the severity of the impact we are seeing today is due to human impact, whether it be direct or indirect. Several studies have been done to try and estimate the most accurate rate of extinction from millions of years ago, but it can be difficult to measure the data, and the results from these studies are often inconsistent. Fossils do not always allow for scientists or ecologists to come up with accurate estimates on the rate of extinction because fossils do not represent all animals – on top of that, fossil records can rarely identify the specific species of the animal that it came from. Lucas Joppa, a renowned scientist at Microsoft Research stated:

The total number of species on earth has not been declining in recent geological history. It is either constant or increasing. Therefore, the average rate at which groups grew in their numbers of species must have been similar to or higher than the rate at which other groups lost species through extinction. (Orenstein, 2014)

Researchers at Brown and Duke Universities initiated a series of studies to try and gather an estimate for what the background extinction rate was, and through three separate data approaches, it was conclusively found that the background extinction rate was around “0.1 million extinctions per million species per year” (Orenstein, 2014). Many scientists, including those researchers at Brown and Duke universities, agree that the modern global extinction rate is about 100 times worse than the background extinction rate, including Daniel Simberloff, a

professor of environmental studies at the University of Tennessee. Daniel Simberloff, who has conducted a number of studies and research on the topic of species extinction, wrote:

Even though it's hard to compare past extinction rates with that of the present, given missing data from the past, we do know how to identify extinction periods: the elevation of extinction rates in those periods are at least a hundred-fold over the slow "background" rate of "normal" extinction. (Simberloff, 2000)

These estimates can be difficult to understand how quickly that extinction is happening every day. To put it into a more direct perspective, it is estimated by many scientists and researchers that 90-99% of all species that have ever existed have already gone extinct – this includes extinctions from the five previous mass extinctions on earth, as well as the mass global extinctions that we are seeing before our eyes today. The U.N. Convention on Biological Diversity stated they believe that nearly 150 species are going extinct every day – this could potentially result in a loss of 10% of our living species every decade (Pearce, 2015). Data on extinctions can be difficult to collect as there are situations of species that have not been seen or observed in a certain amount of time, but they could still exist. Another issue with studying the rate of extinction is that much of the studies are done electronically on computer systems, and there is believed to be an extensive number of animal species that have never been discovered or documented. For example, the Guadalupe fur seal had been thought to have died out a century ago and was categorized as extinct, but researchers are finding, now, that the populations of these seals are collectively over 20,000 (Pearce, 2015). These variables in numbers and inconsistencies have led to varying results in several studies that are searching for the same answers. One thing that can be agreed upon by nearly all scientists and experts is that the global extinction rate is increasing greatly at the hands of humankind, and there is only room for it to continue to rise.

There is also a general agreeance that the rate of extinction is inconsistent and more common in some areas than other areas, depending on the conditions, but one of the most discussed topics is many of the extinctions in species that are living today can be connected to some kind of human contribution. “Earth is currently experiencing a biodiversity crisis. Recent estimates suggest that extinction threatens up to a million species of plants and animals, in large part because of human activities such as deforestation, hunting, and overfishing” (Greshko, 2019). Many scientists also believe that if humans were taken out of the equation in our world today, extinctions would be occurring at a rate that would be hundreds of times slower (Greshko, 2019). On the other hand, many studies have estimated that humans have sped up the rate of extinction by more than 1,000 times what they natural rate would be (Orenstein, 2014). The mass extinctions that Earth has endured in the past can be heavily attributed to major changes in Earth’s carbon cycle and other natural adverse climate conditions – the global climate change that we are experiencing today is everything but natural, and nearly all of it can be tracked back to how humans are living their everyday lives. A lot of the speculation when it comes to a modern mass extinction is concerned with the prolonged climate change – while climate change can go through natural cycles as we have seen in history, the global warming that our planet is currently experiencing is proven to already have had detrimental effects on our environment, and it is only expected to get worse if there is no action taken by the human population to reverse it or slow it down to some degree. “A growing body of evidence indicates that current species extinction rates are higher than the pre-human background rate” (Ceballos, et al., 2015). Human activity is one of the greatest contributors to the gradual warming of our planet which, in turn, has pushed many animal species to the brink of endangerment and many to extinction.

When it comes to the different events that are impacting animals the most heavily, it is without a doubt that global warming is a large contributor for several different reasons. Global warming is the gradual warming of our earth's atmosphere over time – we are finding that planet Earth is getting increasingly more warm every year, and these changes are making it difficult for several plant and animal species to be able to survive in the new climate. “The Earth's atmosphere has warmed by 1.5 degrees Fahrenheit since 1900. The 10 warmest years on record have all occurred since 1998, with 2016 being the warmest year on record” (Climate Change). Many people view the increasing temperatures as a natural cycle that the environment will inevitably endure, regardless of human interaction, but there is striking evidence that much of the impact of global warming is brought on by human actions. While there are some natural greenhouse gases, most of what we are seeing is coming directly from humans – through the excessive burning of fossil fuels and oil, more carbon dioxide is being trapped in the atmosphere, allowing less and less heat to be able to escape. “Since the Industrial Revolution, the burning of coal, oil and natural gas has emitted roughly 500 billion tons of carbon dioxide, about half of which remains in the atmosphere (Climate Change). There are several different industries are impacting the emissions of greenhouse gases – electricity and heat production (the burning of natural gases, oil and coal for the purpose of electricity and heat) is the most impactful industry that makes up about 25% of the global greenhouse emissions (Global Greenhouse Gas). Agriculture, the cultivating of crops and livestock, accounts for approximately 24% of greenhouse gas emissions, industries that burn fossil fuels for energy on-site accounts for 21%, and transportation accounts for 14% based upon 2010 global gas emission estimates (Global Greenhouse Gas). Altogether, in the last 50 years, emissions have increased by around 90% with the largest contributors being China and the United States (Global Greenhouse Gas).

In its Fifth Assessment Report, the Intergovernmental Panel on Climate Change, a group of 1,300 independent scientific experts from countries all over the world under the auspices of the United Nations, concluded there's a more than 95 percent probability that human activities over the past 50 years have warmed our planet. (The Causes of Climate Change)

The dangerous impacts of global climate change are not only limited to the warming of our atmosphere. As the atmosphere is warming, ocean water is expanding and is causing sea levels to rise at a pace that is much more rapid than scientists could have predicted. Rising sea levels can be detrimental to several animal species, but according to recent projections, “2 to 3 degrees Fahrenheit warming could bring about three feet of global sea level rise by 2100” which would result in the displacement of 56 million people that live in 84 developing countries all around the world (Climate Change). One of the most devastating impacts that rising sea levels will have on the human population is that as the sea levels continue to rise, the shorelines will be pushed further inland, forcing many people to relocate – this would result in more areas being overpopulated, and overpopulation is one of the main contributors to the excess greenhouse gas emissions. The increasing rise of sea levels has the potential of completely inundating coastal regions and completely wiping out a number of habitats that so many species rely on. Not only are rising sea levels a result of these changes, but global warming is also partially responsible for the decline in healthy coral reef habitats – many scientists have even deemed parts of the great barrier reef as dead. On top of rising sea levels, global warming onsets a strong decline in the planet’s sea ice. “Since 1979, Arctic sea ice extent in September (when the annual minimum is reached) has declined by more than 30 percent, according to the National Snow and Ice Data Center” (Climate Change). There are several species that are slowly being pushed out of their

homes as our sea ice is melting away with the warming environment – animals such as polar bears have extremely limited options, and this has resulted in a steady, but increasing decline in the number of polar bears that are still living today. Whereas other animal species may have an option to relocate, the rapid loss of sea ice is the most significant threat to the longevity and survival of polar bear populations. The numerous and devastating impacts that global warming has on our environment have already resulted in irreversible damage, but the effects are only predicted to become more harmful to our environment. Not only do the warmer temperatures affect animal species, but it also affects the life cycles of several plant species – with so many animal species relying on plants for nutrition and survival, the disruption of the availability of certain plants could further drive animals away from their natural habitats to try and adapt. This mostly affects animals that are “highly specialized” in their diets and the areas they inhabit – for example, koalas rely mainly upon eucalyptus and live primarily on isolated mountaintops (Dell’Amore, 2014). This puts koalas at high risk if there happens to be any changes to the availability of their habitat or eucalyptus.

The Intergovernmental Panel on Climate Change estimates that 20 to 30 percent of assessed plants and animals could be at risk of extinction if average global temperatures reach the projected levels by 2100. Evolution would have to occur 10,000 times faster than it typically does in order for most species to adapt and avoid extinction. (Cho, 2015)

The rate at which we are seeing the planet’s climate become warmer each year is incredibly too fast for species to be able to properly adapt and overcome the changes. As stated earlier, there are natural greenhouse gases that exist in our atmosphere, but it would not result in the rapid rise of temperatures the way we are seeing now. If we are unable, as a planet and as a country, to work together to mitigate the effects of these changes and possibly slow down the process, there

will come a point where there are no other options. The functionality of every ecosystem depends on stability of its environment and availability of its environment, and there are changes that humans can make to support the survival of our species. There has been very little collective effort within our country to try and help the situation, and unfortunately, there are some species that are already facing the traumatic aftermath of global warming, and many of these animals have been deemed at risk, endangered, or even extinct.

One of the most tragic results of global climate change is a species population becoming so decimated that the species goes completely extinct. This was a reality for multiple different species in the last few decades, and the same patterns are only expected to follow as the temperatures continue to rise and at possibly faster rates. The golden toad, which went extinct in 1989, was a species that lived in Central America – due to drought and other climatic changes, the habitat in which they inhabited, mountaintop cloud forests, had completely disappeared (Dell'Amore, 2014). Some species are being driven out of their only habitats that they are not given an efficient amount of time to relocate, settle into a new, suitable ecosystem, and adapt to any changes in climate, resources, and new predators and prey. There is also the orange-spotted filefish that went extinct in 1988 – the orange-spotted filefish was a species of fish that lived within the coral reef habitats and completely depended on them for survival. The species was “highly sensitive” to warmer water temperatures, and during an episode of rising ocean temperatures, the population of orange-spotted filefish became reduced to the point of absolute extinction (Dell'Amore, 2014). Temperature sensitivity is common among many different species of fish, including the North Atlantic cod – the North Atlantic cod is considered vulnerable and populations of the species have not been able to recover since a sudden crash in the ecosystem where it is estimated that the changes are due to climatic influence (Dell'Amore,

2014). Temperature changes in any ecosystem can affect the species that inhabit it in several different ways – the species itself may not be able to survive in certain temperatures, the prey that a particular species feed on may not be available in certain temperatures, and the oceans are gradually becoming more acidic with the all of the added greenhouse gases in the environment. Another consequence of the increasing greenhouse gases is the frequency of acid rain – this rain can be incredibly toxic for many species that inhabit bodies of water, and without the proper balance of oxygen and other compounds within the water, species may be completely unable to survive.

Climatic changes affect far more species than most people would imagine. It is not always as obviously as the polar climates facing adversity, such as polar bears being driven out of their habitats. According to several studies, there are more than 700 mammals and birds that are presently threatened with extinction as a result of the effects of global climate change – an estimated 47% of land mammals and just over 23% of threatened bird species have already been impacted by the negative effects of climate change in some way (Johnston, 2017). Many primates and marsupials are more at risk against the devastating climate events due to the fact that they have lived in tropical environments that are historically known to have had stable climates for centuries (Johnston, 2017). It is important to recognize that some of the adverse effects of global climate change is adverse weather changes – areas that are not used to experiencing a lot of rain may see heavier rainfall, and areas that are dependent upon their rainfall are susceptible to seeing droughts. Another large concern that comes with these weather pattern changes is the fact that new, invasive species could be potentially be brought into areas that never experienced them before (Climate Change). With these invasive species suddenly becoming a part of any given ecosystem, the animals who currently inhabit within that

environment will not have time to adjust and will likely be forced to migrate away from their homes in order to survive. Although there is a significant amount of strong scientific evidence that global warming is going to affect every form of life in the upcoming years, there are still plenty of people who either do not believe that climate change is real at all, or they question the reality of it actually affecting them personally. There is very little education on the topic, and many government officials have encouraged the American people to believe that climate change does not exist. It is critical that with America being one of the top contributors to the greenhouse gas emissions, we need to start devising a plan on how to reduce these emissions as a country, as well as steps as can take at an individual level that can make a difference.

When it comes to the reversal or at least the slowing of the process of climate change, there are steps that need to be taken at a federal level in order to see any real, positive change. Most of the human-caused greenhouse gas emissions are coming from large industries and companies, not as much on an individual level. That is not to say that humans are not impacting global warming at an individual level because collectively, the human population does make up a considerable amount of these emissions between driving a car, using nonrenewable sources of energy, and wasting valuable resources such as water, for example. Unfortunately, as an individual person, there is no way to single-handedly stop climate change, so we need to begin looking towards our government to make changes within these industries to try and reduce these harmful emissions for the sake of the planet. It needs to be understood and accepted that no there is no possible chance of reducing these emissions to zero, and even if there was, reducing these emissions to zero would not stop global warming for potentially centuries due to the current state of the atmosphere – the changes will only be able to mitigate the effects of global climate change by reducing them through a variety of different channels.

It is realistic to assume that without government support of these changes, the reduction of these greenhouse emissions will never be enough to combat or mitigate the damages that the planet is already facing. With America being the second largest contributor to these emissions, there has to be involvement within our country's government to accept the responsibility of how it is affecting the environment and how we will move forward to try and alleviate our impact. Regrettably, in 2020, there is very little support from our President to collaborate with other countries to try and come together and start making moves. An international collaboration to reduce greenhouse gas emissions, such as the Paris Agreement, would have been a significant opportunity for the United States to start putting some of these changes underway. The Paris Agreement intended on working towards reducing greenhouse gas emissions by aiming to keep the global temperature increase below 2 degrees Celsius above the levels during pre-industrial times (Woodward, 2019). This kind of global response has the potential to make monumental changes to reducing these emissions and slowing down the rate of global warming.

Unfortunately, in 2017, the United States' President Donald Trump announced that America would be pulling out of the agreement, despite the fact that America is the second largest country that contributes to this pollution. "The Paris agreement, adopted on December 12, 2015, set international objectives to cut greenhouse-gas emissions in order to keep Earth's climate from warming more than 2 degrees Celsius by the year 2100" (Woodward, 2019). Trump has made it incredibly clear through a number of statements and social media posts that he does not believe in climate change or the affects that is has on our planet. The repercussions of having the leaders of our country making statements like this are that the American people will begin to conform to the idea that climate change is not actively happening, and less people will try and make changes to help the situation. Trump claims that America remaining a participant in the Paris Agreement

would onset financial hardships for the American people, but Andrew Steer, the CEO of the World Resources Institute, released in a statement that the Trump administration has created a “false dichotomy between climate action and economic hardship” and that through the United States’ withdrawal from this agreement, it shows that they do not care for science or economics” (Woodward, 2019). There have been a series of moves that Donald Trump has made in his presidency that have regressed policies that have been put in place to protect our environment. There have been considerable cutbacks within the US Endangered Species Act and the Environmental Protection Agency’s Clean Water Act (Woodward, 2019). Nearly 70% of American voters disagreed with the decision to withdrawal the United States from the Paris Agreement, and even half of those voters were Republican (Woodward, 2019). One of the most important things that the American people can really do, right now, to influence any kind of government action is to reach out to their state elected officials and express concerns with climate change. While we are definitely stronger as a country than we are when we are divided state by state, any kind of action is the step in the right direction for our planet’s future.

At an individual level, there are small steps we can take every day to try and push this movement forward. One of the most common misconceptions is that making these types of changes in our daily lives will require a lot of effort or considerable financial investments, but that is not necessarily true. As noted earlier, agriculture contributes to a significant amount of these greenhouse gas emissions – the choices that we make when shopping at the grocery store are actually a great way to support the environment. “Livestock—meat and dairy—is responsible for 14.5 percent of manmade global greenhouse gas emissions, mainly from feed production and processing and the methane (25 times more potent than CO₂ at trapping heat in the atmosphere over 100 years)” (Cho, 2018). Choosing to consume more fruits, vegetables, and plant-based

foods is one of the easiest ways to reduce your carbon footprint as an individual, and many of the things we already eat are plant-based anyways. This is not to put pressure on every person to switch to a vegan diet, and even if someone chooses to continue to purchase and consume meat, making one day out of the week a meatless meal day actually makes quite the difference. Any given day that an individual goes without consuming meat and dairy is reducing their carbon footprint by approximately 8 pounds (Cho, 2018). While this is not an option for every person in the United States, shopping for groceries locally rather than at a chain grocery store can also help reduce global greenhouse gas emissions. When shopping locally, the food is sourced from within the country, a lot of the time within the state or possibly even the city that it is purchased from – this helps reduce emissions as there is less of a need for food and resources to be imported by plane which is one of the methods of transportation that greatly contributes to global warming. On top of these choices, it is always smart to try and reduce any waste, such as plastic grocery bags and buying products that utilize minimal packaging – recycling approximately half of your household waste that typically gets thrown into the garbage can reduce carbon dioxide emissions annually by 2,400 pounds (Ten Ways to Reduce).

There are also dozens of miniscule changes that we can make to our everyday lives within our own homes that take no extra time or effort, but they collectively make a notable difference. One of the easiest steps is being sure that you are not wasting any energy in your home – turning off any lights and unplugging electronics when they are not being used are simple ways to conserve unnecessary energy. Switching over to products that help conserve energy is another way to reduce these harmful emissions, and this includes many light bulbs that could easily be substituted into nearly every person's home.

If every household in the United States replaced one regular light bulb with an energy-saving model, we could reduce global warming pollution by more than 90 billion pounds over the life of the bulbs; the same as taking 6.3 million cars off the road. Not only do these actions help support the environment, but they are typically more cost-effective, as well. (How You Can Help)

Other small changes include monitoring your thermostat, keeping it a few degrees cooler in the winter and a few degrees warmer in the summer which translates to a substantial amount of energy conservation, and also, paying attention to which appliances in your home have the Energy Star Label. “If each household in the United States replaced its existing appliances with the most efficient models available, we would save \$15 billion in energy costs and eliminate 175 million tons of heat-trapping gases” (How You Can Help). When it comes time to start looking for new appliances, the upfront cost may be a little more than your standard appliances, but over the course of a couple of years, energy-efficient appliances allow for your home to conserve a sizeable amount of unnecessary energy.

While there is a significant amount of potential to cut down on these toxic greenhouse gas emissions at an individual level, the reality is that the main contributors are the ones that have to put forth the most effort to make any altering changes. Industries are the main contributing factors when it comes to how powerful the impact these emissions have on our planet, and it is more critical now than ever for businesses and companies to start looking at how they can successfully move forward in a more environmentally-friendly manner. Oil and gas companies, such as Shell and BP, have stepped up to the plate by developing new strategies to try and cut down on their carbon footprint. Shell, in 2017, decided to implement a program to reduce its carbon footprint by reducing operational emissions and emissions that are related to

the use of their products, and BP has begun to invest in battery chargers for electric vehicles to cut down on unnecessary, wasted energy (Underwood, 2019). Power providers are also working to try and substitute the fuels that they use to generate electricity by finding ones that are more environmentally conscious. Many consumers do not understand the benefits, for themselves or for the environment, of reducing their carbon footprint, so Natural Grid, a natural gas and electric company, launched an “energy efficiency and solar marketplace” for consumers to have the opportunity to receive rebates when they choose to purchase and install energy-efficient equipment, as well as free quotes and consultations for solar system installations (Underwood, 2019). Auto manufacturers are also recognizing their contribution to these emissions – General Motors has made a commitment to utilize 100% renewable energy sources by 2050, and Toyota, as a part of their “Environmental Challenge 2050”, is striving to eliminate carbon dioxide emissions within their operations and supply chains, as well as using more recyclable materials when it comes to the production of new vehicles to mitigate waste (Underwood, 2019).

The increasing rate of global extinction is a result of a handful of impacts that are often caused directly or indirectly caused by humankind. Global warming has led to the loss of so much biodiversity and wildlife through pushing species out of their natural habitats and into areas where they cannot survive, but there is a significant amount of habitat loss that is unrelated to global warming and much more direct and, often times, can be more devastating. Deforestation is happening all around the globe, and it is taking place at an increasing, alarming rate. While deforestation is something that is happening all over the world, much of it is taking place in tropical forests.

Tropical forests are incredibly biodiverse; they support at least two-thirds of the world's biodiversity despite covering less than 10% of Earth's land surface. Unfortunately, prospects for tropical forests and the biodiversity therein are becoming increasingly bleak owing to unabated deforestation and forest alteration that stem from human activities such as logging, hunting, agricultural expansion, and human settlement. (Giam, 2017)

Much of this destruction is a result of illegal logging and mining operations, and the governments that are supposed to be there to protect these natural areas are not efficiently staffed in order to try and alleviate the problem even though from July 2018 to July 2019, the country of Brazil had seen the highest rates of deforestation in 10 years. (Dwyer, 2019). The Amazon rainforests are home to an incredibly wide variety of animal and plant species, and there is a growing concern among scientists and environmentalists that there are species that have yet to be discovered that are at high risk of being driven to extinction. For these animals that inhabit these soon-to-be destructed areas, there is no warning or attempt to move these animals out gradually – to accomplish this would take far too much time and effort, and when it comes to the decimation of these natural areas, the safety of the animals is not a high priority. The loss of so many trees and vegetation leaves a number of species at risk of having no resources, and for many species, the tree coverage helps with regulating the heat that passes through the trees. Habitat loss is something that happens very quickly, sometimes overnight, leaving many animals with little to no options to relocate in a short period of time – many of these animals cannot survive with such little time to adapt to a new home.

In the last century, the human population has grown at a rapid pace with a significant rise in the Earth's population, and with that increasing population comes a need for more space to accommodate. Some of the most common reasons for habitat loss for so many species are

agriculture, land conversion for development, water development, and pollution (Habitat Loss). The places that used to serve as habitats for wildlife have been converted to shopping malls, industry sites, office parks, roads, apartment complexes, and parking lots – one of the indirect effects of habitat loss is that the wildlife that surrounds these developed areas, especially within bodies of water, are at risk of being polluted from chemicals, acid rain, and fertilizers which only worsens the original impact. Many natural areas are also being destroyed in order to develop cropland and areas for livestock – “80% of deforestation comes from small-scale agriculture and cattle ranching” (Effects of Deforestation). Over time, there is becoming less and less suitable land for agriculture purposes, and one of the cycles of removing so many trees is that it leaves less water in the air that is able to be returned to the soil – in turn, the soil becomes much more dry and results in even less land to grow crops (Effects of Deforestation). The rate of global warming, also, is fastened by the removal of so many trees – these trees are responsible for much of the oxygen that is in our atmosphere, and by destroying so many of these natural, untouched areas, there is only more room for the harmful greenhouse gases to be emitted (Effects of Deforestation).

When it comes to measuring or determining the causes behind the loss of so much wildlife and biodiversity, one of the most visible impacts that humans directly contribute to the devastation is poaching and hunting. Poaching is the term that refers to the illegal killing, taking, or trapping of animals or plants from areas that are protected or certain private property. Originally in the 17th and 18th centuries, poaching was mostly consisting of subsistence poaching where those with less resources and impoverished peasants would hunt for game or fish to add to their insubstantial diet (Poaching). While it was still illegal, this kind of poaching was motivated

by survival, but modern day poaching has become something entirely different. Most of the poaching that we are seeing today is done with the purpose of selling the game that is killed or trapped for profit. One of the strongest motivators for poachers is to obtain trophies from these animals, such as ivory tusks from elephants, to sell within the black market as many of these trophies are highly sought after for their medicinal value. Another example of these trophies that poachers hunt for is the rhino horn – rhino horns are often used in Asian medicines, and they are sold for anywhere between \$15,000 to \$30,000 in places such as Vietnam, considered the largest hub for rhino horn export, and many other areas (Poaching Deaths Visualized).

Poaching is one of the primary reasons why a wide variety of animals are at risk of facing endangerment and even extinction. “This is the case with the African elephant, more than 100,000 of which were killed between 2014 and 2017 for ivory. Poaching has also had a catastrophic impact on rhinos, with more than a thousand slaughtered a year for their horns” (Actman, 2019). There are thousands of animals that are classified as endangered that die every year at the hands of poachers in Africa alone (Poaching Deaths Visualized). Within the last two centuries, we have found that several animals have been hunted to extinction, and there are nearly 20,000 species of animals and plants that are at a very high risk to become extinct – some of these animals include the West African black rhinoceros, Tasmanians tigers, bubal hartebeests, Javan tigers, Caribbean monk seals, and many more (Gerken, 2013). Many of these animals have been hunted into extinction, but there are many poachers who kill certain species in order to protect their land from any crop damage or protect their livestock from being consumed. On top of that that, there are plenty of hunters who kill game or capture game just for fun. Many poachers will travel to hunt for exotic animals to keep as pets or to have preserved and displayed in their homes to show off. There are a number of species that are dangerously close to becoming

extinct, including the entirety of black rhinos, vaquitas, red-fronted macaws, pangolins, addaxes, and Asian elephants – sadly, the vaquitas are not even a target to be poached, but they are still critically endangered as they get caught up in the nets while hunters illegally catch totoabas, and there currently only 10 known vaquitas in the population (Actman, 2016).

If some nations have seen modest improvements in poaching figures, the future of threatened species remains unfortunately grim. While estimates suggest elephant poaching will remain relatively stable through 2030, the fate of rhinos seems direr.

Indeed, our data suggest rhino poaching will increase by about 356 percent between 2015 and 2030. (Poaching Deaths Visualized)

On top of the animals that are being hunted to extinction, plants are also at risk of being poached for a variety of different reasons. When we think of poaching, we tend to not think about the plant side of wildlife, but there are several species in nature that are valuable and highly sought after for the purpose of making a profit. “Even when forests are not completely cleared, particularly valuable trees such as rosewood or mahogany may be illegally logged from an area, eliminating both the tree species and all the animals that depend on it” (Poaching). The removal of certain species in nature will be detrimental to the livelihood and survival of the animals that have limited sources of food. Those who poach plants may not think that there is as much impact as there would be if they were hunting or trapping game, but it is still creating an imbalance in the food web, as well as potentially killing off several animal species.

Poaching, though, is not unique to only Africa – while a good fraction of poaching activity takes place in this continent, there is poaching of all kinds of species taking place across the globe that often go unnoticed, and many of those poachers travel outside of their own country in order to travel, kill, and return to their country with their game to sell. There are many hunts,

also, in which people are travelling for that are completely legal and regulated by government agencies, but the prices are costly and argued to be beneficial to conservation and local communities. Big-game hunting or sport hunting is something that people go out of their way to do to as a source of entertainment, and often, they will post photos of themselves with the game that they have killed as a memory or trophy. These types of hunt require expensive permits as a way for the government to profit, where hunts cost tens of thousands of dollars, sometimes hundreds of thousands for just one kill – in some countries of Africa, \$200 million is annually spent on these permits (Weisburger, 2017). Many hunters combat any backlash they receive from taking part in these hunts by claiming that the money they have spent gets put back into the community and into conservation efforts, but some of these legal hunts are allowing or animals that are already categorized as threatened or endangered to be killed. Some perfectly healthy animals are hunted under the guise that it will stimulate breeding within a population. “Black rhinos are listed as critically endangered, with only 5,000 individuals remaining in the wild. Yet the Namibian government maintains an annual hunting quota of five post-breeding males, to stimulate population growth by allowing younger males to breed” (Weisberger, 2017). The alternative could be donating these animals to zoos, rescues, or sanctuaries for them to continue to live full lives rather than killed for profit. Most people believe that spending hundreds of thousands of dollars to kill one animal and claiming that it aids conservation efforts is redundant – the money could easily be donated towards these efforts directly without having to kill an animal that is more than likely already at risk or vulnerable to extinction.

Despite the high levels of poaching, there is a significant amount of effort that goes into protecting our nature’s wildlife and the areas they live in – for rangers out in the wild, that job can be incredibly dangerous. Between the years of 2009 and 2016, nearly 600 rangers were

gunned down while on the job, and in the Democratic Republic of the Congo's Virunga National Park alone, which is considered to be the most dangerous park in the republic, at least 170 rangers over the past two decades have also lost their lives to poachers while protecting wildlife (Actman, 2019). "Poaching has been linked to armed militia groups in Africa suspected of trafficking ivory to fund their operations, and it often occurs alongside other crimes including corruption and money laundering" (Actman, 2019). While poaching is punishable by prison and many poachers are caught and sent to serve their time, it does not seem to act as a strong deterrent for those who are still out, illegally hunting for game. Some countries have gone so far as to ban trophies, such as elephant tusks and rhinoceros horns, from being brought back from these hunts to try and discourage their people from taking part in these hunts, even the legal ones, and keep out the trafficking of these products. Unfortunately, the United States seems to be regressing, in some part, from protecting these species from being poached and hunted – in 2018, President Donald Trump lifted a ban that had previously prevented Americans from game hunting and bringing back their trophies from elephants and lions from certain countries in Africa. Members of the Trump family take part in hunting for sport and "trophy" hunting, and all that lifting that ban will accomplish is encouraging the American people to continue to take part in these hunts and continue to diminish the populations of these animals.

There are many indirect contributors when it comes to the destruction of biodiversity and the abundance of species on our planet. They are not as obvious as other contributors, such as poaching or global warming, but they can still heavily impact the rate of global extinction. One of the important topics to recognize when considering global extinction is trophic cascades –

trophic cascades are interactions that have the capacity to control entire ecosystems, and they occur when “predators limit the density and/or behavior of their prey and thereby enhance survival of the next lower trophic level” (Silliman & Angelini, 2012). In a perfect world, the food web would always be in balance, but trophic cascades are the result of an imbalance between the predator and their prey. For example, if a particular animal were to go extinct or become endangered for any reason, any predators that consume that animal as food would either become endangered for any reason, any predators that consume that animal as food would either begin to die off from starvation, or that predator would have to look for another source of food. It becomes an entire chain reaction where any animal that is taken out of the food chain is going to affect their predators and the species they prey upon.

“In many instances, trophic cascades have been initiated by human persecution and harvesting of top carnivores, such as wolves and big cats in terrestrial ecosystems and sharks, tunas, and game fish in aquatic ecosystems” (Carpenter, 2019). There are some cases where trophic cascades can be considered natural and out of the hands of human impact, but a lot of the resulting damage that they cause can be argued to be caused by the actions of humankind. The hunting and killing of these larger animals not only affects that particular species, but it affects the entire structure that lies beneath. Even for species that are less connected to the food web than others, any changes made within the ecosystem affects every species within that habitat. With the larger predators being taken out of the equation, we are often left with an abundance of smaller predators, a more simplified plant community, less diversity within our songbird community, and an increased population of large herbivores (Carpenter, 2019). There was a series of experiments conducted to observe the effects of trophic cascades, and it was discovered that trophic cascades have the ability to control “biomass and production of

phytoplankton, recycling rates of nutrients, the ratio of nitrogen to phosphorus available to phytoplankton, activity of bacteria, and sedimentation rates” (Carpenter, 2019).

“The loss of large carnivores is now being recognized as possibly ‘humankind’s most pervasive influence on nature’, in part because the fear (perceived predation risk) they inspire in other animals may constitute a significant “ecosystem service” critical to conserving biodiversity and ecosystem function” (Suraci, Clinchy, Dill, Roberts, & Zanette, 2016). Some species are considered less interactive than others – of course, species that are not as connected within the food web will not experience the effects that other species do. Some species are known as “strongly interactive” when in the event of its absence, significant changes within the ecosystem that it inhabits will take place – some of those changes include structural ecosystem changes, an imbalance of the import and export of nutrients, and importantly, a decrease in native species diversity (Keystone Species). It goes further than just the species of animals that exist within an ecosystem – for example, when gray wolves in Yellowstone National Park went extinct locally, there was significant increase in the number of elk which then led to changes in vegetation structure (Keystone Species). It was not until the wolves were restored and reintroduced back into the park that the vegetation was given the opportunity to recover and vegetative patterns were able to return to their original state. The removal of any kind of species, whether it be an incredibly interactive animal species or a less interactive producer species, will onset a numerous amount of changes within the biodiversity within its unique ecosystem. It is important to acknowledge all of the indirect impacts that humans have upon the planet, and paying attention to how each small action invites a number of following consequences gives us the chance to observe those changes and find ways to mitigate the negative effects.

When so many different species are going extinct at the rate they are, it can be perplexing to consider what steps that humans are capable of making to try and slow down global extinction and how they are able to do it. Something that many people do not understand about zoos and aquariums is that they actually provide a ton of resources and support when it comes to the conservation and protection of endangered species. It would be false to claim that every zoo in the United States, much less across the globe, is following every law and guideline that is set in place to protect animals that are in the wild – although it is incredibly illegal for an institution to take an animal from the wild and put them on display in their zoo, it has been done in the past and will more than likely continue to happen behind the scenes, unfortunately. At the sake of making a profit, there will probably always be individuals who forgo the welfare of their animals for the quality of the zoo and quantities of their species. With all of that being said, most zoos contribute a great deal of effort to helping with animal conservation and repopulating at risk and endangered species. The Association of Zoos and Aquariums (Vernon, 2019) was established in 1971 alongside growing worries and concerns for animal care within the United States – the “Accreditation Commission” includes trained experts with a plethora of experience in operations, those that are well-trained in animal husbandry as well as veterinary medicine (About AZA). When the AZA was initially founded, it was voluntary for zoological parks and aquariums to obtain accreditation while still maintaining AZA membership, but in 1985, AZA made it a requirement to become accredited – even after a striking drop of 75% in AZA membership, they held onto that policy in order to try and raise the bar for these institutions across the country (About AZA).

U.S. agencies such as OSHA and the USDA consider AZA standards as the “national” standard, and they refer to AZA standards when evaluating institutions. AZA’s rigorous,

scientifically based and publicly-available standards examine the zoo or aquarium's entire operation, including animal welfare, veterinary care, conservation, education, guest services, physical facilities, safety, staffing, finance, and governing body. (About AZA)

Nearly all of the top zoos and aquariums in our country, now, are members with the AZA to provide the best care for our nation's wildlife and support the conservation and protection of our species.

In more than 100 countries annually, AZA-accredited zoos and aquariums and participating and supporting more than 2,500 conservation projects (Vernon, 2019). There are several ways that these institutions are working to support our wildlife, such as implementing breeding programs, efforts to reintroduce certain species back into the wild, habitat conservation, educating the public, and more.

Zoos and aquariums are an essential part of the recovery program for many endangered species listed under the Endangered Species Act. Without the help of keepers, veterinarians, researchers, and educators working for and with zoos and aquariums, many recovery programs would not have the tools and resources they need to prevent extinction. (Vernon, 2019)

Between 2016 and 2017, \$200 million were spent in order to fund these projects and also fund research programs that are run by these AZA-accredited institutions – AZA also has a Conservation Grants Fund (CGF) which provides support, financially, for a number of these projects, such as Gorilla Conservation Efforts in Rwanda and Lemur Conservation Efforts in Madagascar (Vernon, 2019).

Zoos and aquariums, especially within the AZA, are there to support each other. One year, there could be a particular species at a zoo that is not there the next year as zoos, aquariums, and similar facilities are always opening new exhibits, transferring their animals to other exhibits to better their wellbeing or the sustainability of their species, or releasing animals back into the wild. Species Survival Plans (SSPs) are coordinated by the AZA, and often times, there are some species that only have populations within captivity (Schwantes). In these cases, zoos have to work in partnership with each other to find another institution that may have a mate for an animal that lives at another location to put that species in the best environment for it to breed and repopulate. Ideally, the goal is to take these animals from a state of endangerment to no longer being at risk. This is a lengthy, complex process that requires the time and effort of several teams and committees, but the AZA currently has 115 reintroduction programs in place which includes over 40 programs for species that are currently categorized as threatened or endangered (Zoo and Aquarium, 2019). Some zoos are going to have more advanced breeding centers than others, so sometimes, it is necessary for the welfare and longevity of a particular species for them to be moved from one space to another – when you are at the zoo and notice that a certain exhibit has been taken down, it is likely that the animal is in a place of more advanced care for their species or possibly even in their natural, wild habitat.

Some zoos, such as the Smithsonian National Zoo in Washington D.C., actually charge zero cost for visitors to come to their facility to get an up-close experience with so many different species. Many of these institutions provide educational information about the different species at each exhibit and even tell you if the species is not at risk, at risk, endangered, or extinct in the wild. Education is an extremely impactful tool when it comes to helping the public understand the position our wildlife is in and how they can help. Many of these facilities accept

donations that go towards conservation efforts and research projects, so it is a great way for people to support these projects. Without areas such as these zoological parks and aquariums, our country would not see a fraction of the advancement in repopulating species. It is true that an animal's natural environment is the most ideal place for it to live and thrive, but it has come to a point where the wild is often not as safe, available, or secure as captivity. In many cases, the only opportunity that a species has to survive is within captivity and under the care of one of these facilities. It is also important to note that when it comes to at risk, vulnerable, or endangered species, they are often killed more frequently when they become sick or injured. Many zoos, sanctuaries, and reserves are the only places that these animals can potentially go to be protected and nursed back to health. Many animals that are living in captivity have been rescued by these organizations, and without the opportunities that these facilities provide, there would be a considerably higher number of animals that would have been killed – this, in turn, just increases the rate of extinction. When you go to the zoo, there are plenty of animals that are visibly handicapped or disabled, and the fact that these unique animals are in captivity is the only reason that they were given any chance at life – most zoos have tenured veterinary staff on site for the sake of the caretaking of these animals and any emergencies that may come up. While many zoos, aquariums, sanctuaries, and other facilities do make a profit off of their visitors, it is necessary to acknowledge that without having the ability to charge, many of these animals would not have a comfortable home with convenient care. Often times, people have the misconception that zoos and similar facilities pull all of their animals from the wild for the sake of making a profit, but a lot of this money goes into conservation projects, the care of these animals, and the staff that contribute to the welfare and sustainability of the species that are in their care.

It is evident that every ecosystem, and our entire planet as a whole, is incredibly dependent on a rich, biodiverse environment in order to be efficient and functional. Every ecosystem is exceedingly complex, and each individual species within its environment has its own niche that it is uniquely adapted to fill. For our wildlife to live and thrive in its natural environment, it is dependent on the availability of a variety of resources, and if those resources are taken away, it directly affects the entire habitat. The removal of any particular species has the potential to throw off the entire structure and cause trophic cascades – if one species goes extinct, it may leave another species with no sources of food. This could lead to several species within a single ecosystem with a lack of resources, forcing them out of their natural habitats in order to find a new environment that will be more suitable. Sometimes, this process happens so quickly that many animals do not have the opportunity to move or adapt. When it comes to the crisis of the rising rate of global extinction, there is no easy explanation or simple solution, and everything is very interconnected. There are endless numbers of contributors that affect so many different facets of wildlife sustainability, and every consequence has the ability to bring other negative effects with it.

It is safe to say that after looking at the heaviest, most negative impacts upon the environment, humans are responsible for a substantial majority of the detrimental consequences that we have seen in the last few centuries. When it comes to the strongest impacts that humans have on global extinction, it is greatly attributed to global warming and habitat destruction. This is not to say that if humans were taken out of the equation that no animals would go extinct – planet earth has endured several natural mass extinctions in the past, prior to the event of human evolution, and humans will more than likely not be the singular cause of every mass extinction that will follow. Industries that burn coal, oil, and natural gas for energy are of the largest

contributors to the harmful emissions alongside electric and heat production, transportation, agriculture, and several other industries. In the past few centuries, humans have had a sizeable influence on the gradual rising of the earth's temperatures, but a majority of the increase in carbon dioxide emissions has happened in the last century and will only continue to rise if there is no interference or commitment to changing our behaviors. Humans even more directly impact the increasing rates of habitat loss in so many different ecosystems – between deforestation for the purpose of obtaining its resources or with intention or build infrastructure in its place, millions of animals are being forced to try and find new inhabitable environments.

One of the other leading contributing factors to the rapidly growing rate of extinction is poaching and illegal hunting of million of animals every year. While there is a growing amount of effort in the countries where poaching is most prevalent, poaching is continuing to happen at a growing rate, and with the populations of these targeted animals becoming more and more decimated, the demand for these animals is also growing, resulting in the situation becoming more dangerous and tragic. Many of these animals that are targeted for their trophies to sell, such as rhinoceros horns or elephants tusks, are already critically endangered and more heavily protected, but unfortunately, these are the species that are most often hunted for with the motivation of selling those trophies for profit. Ideally, federal governments would be putting more laws and regulations into place to discourage people from hunting, especially in the United States where wealthy citizens travel to hunt, but there has not been much successful progress on that front.

On the bright side, the reality is that there are many individuals and organizations that are looking to try and reduce these impacts and support the conservation of our wildlife. Zoos and aquariums implement hundreds of programs annually in order to protect our at risk, vulnerable,

and endangered species by providing many species an environment to live in cases where they may not have been able to survive in the wild. Many Americans are changing their every day lifestyle to lower their carbon footprint and conserve energy in order to be more environmentally-conscious so try and mitigate the effects of global warming, as well. The United States, as a whole, is not making a significant amount of progress that is desperately needed in order to help the crisis that our planet is current facing. There must be more emphasis on the education of these environmental issues, and with more collective effort among Americans and among people all around the globe, we will start to see sizeable changes for our future. The sustainability and livelihood of our wildlife is incredibly dependent on humankind to start making changes, and the sooner that we start taking action, the more productive and effective those changes will be for our environment.

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