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Impact of Climate Change on Animal

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ABSTRACT: Humans are not the only species impacted by our planet's climate crisis. The world's wildlife and habitats will also face profound, sometimes catastrophic, change. Increases in temperature could trigger the collapse of fragile ecosystems and huge waves of extinction. The choices we make today have the power to reduce the suffering of people and animals in the future. The Earth is now about 1.1°C (2°F) warmer than it was in the 1800s. Based on current projections, global temperatures will rise by 2.7°C (4.8°F) by the end of the century. It's impossible to predict exactly how long-term shifts in temperatures and weather patterns will affect our planet's fragile, deeply entwined ecosystems.

KEYWORDS-world, wildlife, climate, change, animal, earth

I.INTRODUCTION

Changes in one area influence changes in other areas and animals will feel the impact. Some of the biggest climate-driven threats for wildlife include:

Habitat loss: Rising temperatures affect vegetation, food sources, access to water and much more. Ecosystems may become uninhabitable for certain animals, forcing wildlife to migrate outside of their usual patterns in search of food and livable conditions, while causing other animals to die off.

For example, if rates of habitat loss and fragmentation due to human development and global warming continue—combined with deaths from poaching—we could lose Africa's elephants in the next 40 years.

Natural disasters: Already today we face a five-fold increase, compared to 50 years ago, in climate and weather-related natural disasters such as droughts, wildfires and hurricanes. These disasters cause catastrophic loss of life and habitat for people, pets and wildlife.

Australia's Black Summer bushfires (2019–20), for example, burned 186,000 square kilometers (72,000 square miles) and are estimated to have killed or displaced three billion koalas, kangaroos and other animals. [1,2,3]

Human-wildlife conflict: Climate change intensifies human-wildlife conflict through habitat loss and extreme climate events, forcing people and wildlife to share increasingly crowded spaces. As ecosystems change, people and wildlife roam farther in search of food, water and resources. Human-wildlife conflict often results in devastating impact for the animals affected.

For example, jaguars sometimes prey on domestic animals and disrupt human livelihoods, leading to retaliatory killings that result in the further decline of already-dwindling jaguar populations.

Extinction: The combination of challenges could cause many animals to go extinct. The world's most vulnerable animals, including those already near extinction, will likely face the biggest threats.

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The North Atlantic right whale, for example, teeters on the brink of extinction, with an estimated 336 individual animals remaining, the lowest count in 20 years. A warming ocean, coupled with a failure to decrease conflicts with humans (vessel strikes and entanglement in fishing gear), could drive this species to extinction.

Thankfully, we have a powerful ally in our fight against climate change: animals and the ecosystems they are part of. The United Nations estimates that healthy ecosystems could account for 37% of the carbon reductions needed to limit global temperature rise.

Healthy ecosystems with abundant plants and trees absorb carbon from the atmosphere and store it. So, preserving or restoring nature is a powerful tool in the race to stop climate change. Healthy ecosystems also filter water, buffer against flooding, reduce the impact of disasters, improve soil health and support rich biodiversity. Keystone species and nearly all animals play vital, sometimes invisible, roles in securing biodiversity and conserving habitats.

For example, whales play a significant role in supporting healthy marine ecosystems. Whale poop provides nutrients to phytoplankton. Like plants, phytoplankton capture large amounts of CO2 and convert it to energy, removing carbon from the atmosphere. When phytoplankton are eaten by other marine animals, such as whales, the carbon continues to pass through the food web, remaining out of the atmosphere and not contributing to global warming.

Elephants play important roles in engineering healthy ecosystems that in turn absorb CO2 and keep it out of the atmosphere. Elephants disperse seeds, fertilize soil, dig wells, create trails for other animals and clear space that encourages new plant growth.[4,5,6]

Pangolins eat ants and termites, keeping those populations regulated, and excavate dens that are used by other animals, both of which are essential in the ecosystems where pangolins live.

Many other animals play equally important roles in the ecosystems where they live.

II.DISCUSSION

Protecting biodiversity is vital in our shared fight against climate change. IFAW's work focuses on shaping a future where both people and animals thrive together in the places they call home. We are working in more than 40 countries around the world across seas and oceans. We partner with local communities, governments, non-governmental organizations and businesses. Together, we pioneer new and innovative ways to help all species flourish.

The Earth and its inhabitants—both human and non-human—depend on a livable climate. Climate change is already having major impacts on wildlife and their habitats, and these impacts are projected to significantly worsen. Unless we immediately act to reduce emissions and help wildlife and ecosystems adapt to the warming already in the pipeline, up to 60 percent of the world's species may go extinct.

Plants remove carbon dioxide from the atmosphere, but the associated animals help maintain plant productivity, diversity, and resilience through pollination, seed dispersal, selective herbivory, pest control, and the enhancement of soil nutrient supply and organic carbon storage. Studies have shown that many wild animals, such as bison, prairie dogs, and wolves, exert outsized control of carbon sequestration by adding 15–250 percent more carbon in plants, soils and sediments compared to where they are absent.

Plants and animals help balance levels of greenhouse gases that heat the Earth. With the help of wildlife, ecosystems can drive the fight against climate change.[7,8,9]

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A Defenders of Wildlife study published in the journal Biological Conservation found that all but one animal species (Oceanic Whitetip Shark) listed as threatened under the Endangered Species Act are sensitive to the effects of climate change. Defenders found similar results for endangered species.

Climate change impacts animals in the wild in numerous ways. It can also amplify the effects of other stressors like land development and invasive species, dimming the prospects of native wildlife.

1. Changing Ecosystems: Impact of Rising Temperatures on Ocean Nutrients

Throughout the world, ecosystems are impacted by changes in temperature, weather, sea level and season duration, as is the wildlife that calls these places home.

For example, rising ocean temperatures in warmer areas restrict the circulation of deep-sea nutrients that feed the phytoplankton, a microscopic marine organism responsible for half of all primary production. According to the U.S. Geological Survey, this means that these creatures, which are essential pieces of the aquatic food chain, are unable to sustainably multiply.

Conversely in colder waters, according to the USGS, rising temperatures are fostering higher populations of these microorganisms because there is less ice to obstruct sunlight.

Habitats are shrinking or disappearing completely, which is forcing plants and animals to live in an imbalanced state.

III.RESULTS

2. Shrinking Habitats

One such animal impacted by decreasing habitat is the salmon in North America.

Salmon are intolerant to water temperatures greater than 65 degrees and require constant flows to reproduce. However, consistent warming temperatures and reduction in water flow are forcing the fish out of historical ranges throughout the West Coast. [10,11,12]

Chinook salmon have notably been hit hard by the effects of climate change. In recent years, the winter-run Chinook salmon that travel the Sacramento River to spawn were unable to successfully reproduce due to high water temperatures. One year, about 95 percent of Chinook eggs and newly hatched salmon were killed by warmed waters. For two years in a row, temperatures of the Sacramento River cooked fish eggs.

These events force salmon to take refuge in any nearby cooler waters, which are usually habitats less likely to sustain historical population numbers. Changes in habitat like the Sacramento River often invite invasive species with far-reaching negative impacts.

3. Animal Health

As changes in weather and temperature alter geographic regions, wildlife may seek out agreeable habitats. This means that invasive species suited to changes in extreme climate may get a foothold in an ecosystem where at-risk native species are unable to hold their place.

With them, nonnative species may bring diseases that native plants and animals are ill-equipped to combat. This reduces biodiversity and adds an additional level of competition for resources in habitats impacted by climate change.

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While some have the ability to traverse to new regions, some are deeply tied to their native ecosystem. In these cases, animals are forced to adapt to unknown seasonal changes, or they won't survive.

4. Phenological Mismatch

Phenology is the study of the relationship between climate and periodic biological phenomena (annual flowers, animal coat changes, etc.). A phenological mismatch is when interacting species change the timing of regularly repeated phases in their life cycles at different rates.

Our changing climate is altering the timing ("phenology") of seasonal events like snowmelt, plant emergence, flowering and food availability. Phenology is the study of the relationship between climate and periodic biological phenomena (annual flowers, animal coat changes, etc.).

For example, the snowshoe hare turns white during the winter to camouflage in the snow. Researchers have found snowshoe hares are still undergoing season color molts as their habitats experience less snowy conditions. Their white fur against the darker coloration of the forest floor increases their exposure to predators.

5. Migration Shifts

Warming temperatures are changing where birds live and when. Birds migrating through North America are traveling at different times and are being found in more northern regions than previously recorded.

Migration is usually matched with nesting and resource availability in the area. As climate change alters ecosystems, however, migratory birds are arriving in locations where seasonal food supplies have already run out.

What you can do to help stop climate change[13,14,15]
Wildlife species around the world are adapting the way they migrate, hunt, and survive to fast-paced climate shifts. Defenders of Wildlife works to combat climate change by being a voice for wildlife and advocating for the best available science to protect native species and habitat from direct threats.

While animals are increasingly at-risk of extinction due to climate change, there is action you can take.

People can help stop the impacts of climate change on wildlife by supporting policies that encourage a diversity of species and donating toward wildlife recovery. Donations made to Defenders support our legal work fighting for wildlife as well as the numerous community projects implemented by field experts that support coexistence work.

Climate change is most definitely a severe issue for planet earth today. Its impacts are being felt around the world, from rising sea levels and more frequent and severe weather events to shifts in ecosystems and biodiversity loss. Among the many groups of living beings affected by climate change, wildlife is particularly vulnerable. Changes in temperature, rainfall patterns, and other environmental factors are affecting the habitats, migration patterns, and populations of many species. As a result, wildlife is facing numerous threats, from habitat loss and fragmentation to species decline and extinction.

The Loss of Habitat

The loss of habitat is one of the most significant impacts of climate change on wildlife. As temperatures rise and rainfall patterns shift, many ecosystems are undergoing profound changes, leading to the loss of habitats for many species. For example, as temperatures increase, polar ice caps are melting, leading to a loss of habitat for animals such as polar bears, walruses, and seals.

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The loss of habitat can have significant consequences for wildlife populations. Many species rely on specific habitats for food, shelter, and reproduction, and changes in these habitats can disrupt these essential activities. For example, if a species loses its habitat due to climate change, it may be forced to migrate to a new area where it may not be able to find adequate food or shelter.[16,17,18]

Furthermore, habitat loss can also lead to habitat fragmentation, which occurs when a habitat is divided into smaller and more isolated fragments. This can make it more difficult for species to find adequate food, mates, and shelter, as well as making them more vulnerable to predation and other threats. Habitat fragmentation can also lead to genetic isolation, reducing genetic diversity and potentially increasing the risk of inbreeding depression.

In addition to the direct impacts on wildlife populations, the loss of habitat can also have wider implications for ecosystems and the services they provide to humans. Ecosystems are complex networks of species and processes that provide essential services such as pollination, nutrient cycling, and water purification.

Changes in Migration Patterns

Climate change is causing significant changes in the migration patterns of many species, from birds and butterflies to marine mammals and fish. Migration is a complex and highly coordinated process that is driven by a range of environmental cues, such as changes in temperature, day length, and food availability. However, with climate change altering these cues, many species are struggling to adapt to the new conditions.

One of the most significant changes in migration patterns is a shift in timing. As temperature is warm, many species are migrating earlier in the year, as the cues that trigger migration occur earlier than they used to be. For example, some bird species arrive at their breeding grounds up to two weeks earlier than they did 30 years ago.

In addition to changes in timing, climate change is also affecting the routes that many species take during migration. For example, warmer temperatures in the Arctic are opening new shipping routes, which are disrupting the migration patterns of many marine mammals, such as bowhead whales and narwhals.

Changes in migration patterns can also have wider ecological implications, as they can affect the interactions between species and the functioning of ecosystems.

The Decline of Species Populations

The decline of species populations is one of the most alarming impacts of climate change on wildlife. As temperatures rise and habitats are lost or fragmented, many species are struggling to adapt, leading to declines in their populations. This can have significant ecological and socio-economic consequences, as it can disrupt ecological processes and reduce the services that ecosystems provide to humans.

The decline of species populations is occurring across a wide range of taxa, from insects and birds to mammals and marine species. For example, the iconic polar bear is facing a significant population decline, as the loss of sea ice is reducing its access to food and breeding grounds. Similarly, marine species such as corals, sea turtles, and fish are facing significant declines in population, as warmer and more acidic waters are disrupting their ability to grow and reproduce.

The decline of species populations can have significant ecological impacts, as it can disrupt the interactions between species and the functioning of ecosystems.

The decline of species populations can also have significant socio-economic impacts, as it can reduce the services that ecosystems provide to humans. For example, declines in pollinators can lead to reduced agricultural productivity and increased food prices.

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Solutions

While the impacts of climate change on wildlife are significant and complex, several solutions can help mitigate these impacts and ensure that wildlife can adapt to the changing conditions. Here are some potential solutions:

Reducing greenhouse gas emissions: One of the most effective ways to address the impacts of climate change on wildlife is to reduce greenhouse gas emissions. This can be achieved through a range of measures, such as transitioning to renewable energy sources, improving energy efficiency, and promoting sustainable transportation options.

Protecting habitats: Another key solution is to protect the habitats of wildlife, such as by establishing protected areas and promoting sustainable land use practices. This can help ensure that species have access to the resources and habitats they need to survive and thrive.

Restoring degraded habitats: In addition to protecting existing habitats, it is also important to restore degraded habitats, such as by replanting forests or restoring wetlands. This can help increase the resilience of ecosystems and improve the ability of species to adapt to changing conditions.

Supporting conservation efforts: Supporting conservation efforts, such as those focused on protecting endangered species, can also help mitigate the impacts of climate change on wildlife. This can involve providing financial and technical support to conservation organizations.

Adapting to changing conditions: Finally, it is important to promote adaptation measures that can help species cope with the changing conditions. This can include measures such as restoring connectivity between fragmented habitats, promoting the use of drought-resistant crops in agriculture, and implementing conservation breeding programs for endangered species.

The impacts of climate change on wildlife are profound and far-reaching. The loss of habitat, changes in migration patterns, and the decline of species populations are just a few of the many ways in which climate change is affecting wildlife around the world. These impacts have significant ecological and socio-economic consequences, including disruptions to ecosystem services and negative impacts on human livelihoods.

However, despite the severity of these impacts, some solutions can help mitigate them and ensure that wildlife can adapt to changing conditions. By reducing greenhouse gas emissions, protecting and restoring habitats, supporting conservation efforts, and promoting adaptation measures, we can help ensure that wildlife can continue to thrive in a changing world.[17,18,19]

Ultimately, addressing the impacts of climate change on wildlife is not just an environmental imperative, but also a moral one. Utilization of resources also gives us a responsibility towards the planet to make it better for other beings as well. By taking action to address climate change and protect the habitats and populations of wildlife, we can help ensure that this responsibility is fulfilled and that we leave a healthy and sustainable planet for generations to come.

IV.CONCLUSION

Changes in climate and extreme weather events have already begun to affect people and nature across the globe. And climate change exacerbates other threats like habitat destruction, overexploitation of wildlife, and disease.

From the shrinking habitat of the polar bear to increased water scarcity driving human-wildlife conflict, these changes will become more pronounced in years to come.

WWF is working to better understand how a changing climate impacts species, and we are developing and implementing solutions to help them adapt to these changes. We are assessing our priority species to determine

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traits that make them resilient or vulnerable to changes in climate, funding projects through our Wildlife Adaptation Innovation Fund, and crowdsourcing data and implementing projects for people and nature.[20]

REFERENCES

1. Usher, M. B. (1986). Wildlife conservation evaluation: attributes, criteria and values. London, New York: Chapman & Hall. ISBN 978-94-010-8315-7.
2. ^ Harris, J. D.; Brown, P. L. (2009). Wildlife: Destruction, Conservation and Biodiversity. Nova Science Publishers.
3. ^ Greenfield, Patrick (September 9, 2020). "Humans exploiting and destroying nature on unprecedented scale – report". The Guardian. Archived from the original on September 9, 2020. Retrieved September 10, 2020.
4. ^ Woodyatt, Amy (September 10, 2020). "Human activity has wiped out two-thirds of world's wildlife since 1970, landmark report says". CNN. Archived from the original on June 10, 2021. Retrieved September 10, 2020.
5. ^ "¿Qué es la CITES? | CITES". cites.org. Archived from the original on 2020-11-14. Retrieved 2020-11-15.
6. ^ CITES 2013. Member countries. CITES Secretariat, Geneva.
7. ^ Izzo, J. B. (2010). "PC Pets for a Price: Combating Online and Traditional Wildlife Crime Through International Harmonization and Authoritative Policies". William and Mary Environmental Law and Policy Journal. 34 (3).
8. ^ Vié, J.-C.; Hilton-Taylor, C.; Stuart, S.N. (2009). Wildlife in a Changing World – An Analysis of the 2008 IUCN Red List of Threatened Species (PDF). Gland, Switzerland: IUCN. ISBN 978-2-8317-1063-1. Retrieved 2 May 2016.
9. ^ Smith KM, Anthony SJ, Switzer WM, et al. (2012). "Zoonotic viruses associated with illegally imported wildlife products". PLOS ONE. 7 (1): e29505. Bibcode:2012PLoSO...729505S. doi:10.1371/journal.pone.0029505. PMC 3254615. PMID 22253731.
10. ^ Smith, KF; Schloegel, LM; Rosen, GE (2012). "Wildlife Trade and the Spread of Disease". In A. Alonso Aguirre; Richard Ostfeld; Peter Daszak (eds.). New Directions in Conservation Medicine: Applied Cases of Ecological Health. Oxford University Press. pp. 151–163. ISBN 978-0-19-990905-6.
11. ^ "Goal 15 targets". UNDP. Retrieved 2020-09-25.
12. ^ Shepherd, Chris R.; Thomas, R. (12 November 2008). "Huge haul of dead owls and live lizards in Peninsular Malaysia". Traffic. Archived from the original on 1 April 2012. Retrieved 14 July 2012.
13. ^ Veggie Revolution: Monkeys and parrots pouring from the jungle Archived 2010-02-09 at the Wayback Machine[self-published source]
14. ^ "Charles Lagus BSC". Wild Film History. Archived from the original on 13 November 2012. Retrieved 14 July 2012.
15. ^ Bélange, Claude (2004). "The Significance of the Eagle to the Indians". The Quebec History Encyclopedia. Marianopolis College. Archived from the original on 3 November 2012. Retrieved 14 July 2012.
16. ^ "Eid Al-Adha 2014: Muslims Observe The Feast Of Sacrifice". Huffington Post. Archived from the original on 21 March 2015. Retrieved 3 March 2015.
17. ^ One or more of the preceding sentences incorporates text from a publication now in the public domain: Herbermann, Charles, ed. (1913). "Animals in Christian Art". Catholic Encyclopedia. New York: Robert Appleton Company.
18. ^ [a b] Scanlon, John (22 June 2017). "The world needs wildlife tourism. But that won't work without wildlife". The Guardian.
19. ^ "How Tourism Benefits Nature and Wildlife - Sustainable Travel International". sustainabletravel.org. 25 January 2021. Archived from the original on 2021-01-25.
20. ^ [a b] Tomasik, Brian (2015-11-02). "The Importance of Wild-Animal Suffering". Relations. Beyond Anthropocentrism. 3 (2): 133–152. doi:10.7358/rela-2015-002-toma. ISSN 2280-9643.

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