



## **AZA Climate Change Position Paper**

Approved by AZA's Board of Directors July 2021

### **AZA Position**

The Association of Zoos and Aquariums joins the global scientific community in acknowledging climate change to be one of the greatest long-term threats to life on earth. Major shifts in weather patterns are already significantly affecting a host of systems, including polar ice loss and glacial retreat, changes in vegetation structure and subsequent alterations in species composition, and changes in ocean currents and rapid loss of coral reefs to bleaching. An increase in fires, floods, and drought are now clearly connected to this global change in climate, which is now understood to be largely human-induced. These changes are being seen across the planet, from far-flung tropical forests to the high Arctic to our ocean (IPCC 2019a, b, Sala et al. 2021), and impacting the species and habitats that AZA-accredited zoos and aquariums are working to protect and conserve.

Collectively, AZA-accredited zoos and aquariums reach approximately 200 million visitors per year and are trusted, science-based messengers for the natural world (Fraser and Sickler, 2009). AZA recognizes our opportunity to take a leading role in implementing and modeling practices that help mitigate and manage climate impacts, and activating supporters to reduce the threat we all face from climate change. Zoos and aquariums are uniquely positioned to reach a large and diverse community by clearly demonstrating the link between our changing climate and its impact on the natural world through the compelling stories of the animals in our care and our wildlife conservation programs in the field.

### **Rationale**

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate, with 195 countries as members. Their 2018 "Special Report on Global Warming of 1.5C" directly links the past-decade increase in record-breaking storms, forest fires, droughts, coral bleaching, heat waves, and floods around the world to a rise of 1.8 degrees Fahrenheit (1.0 degrees Celsius) in global temperatures (IPCC 2018). The report predicts that these weather events and outcomes will get substantially worse with the predicted rise of 2.7 degrees Fahrenheit of warming, which could occur in as little as 11 years—and almost certainly within 20 years without major cuts in carbon dioxide emissions.

These changes are happening fast, and they affect all of us, not just in the Arctic and in tropical highlands but across the globe, including in the United States (Weiskopf et al. 2020; see also Reed et al. 2020). The disruption of species assemblages and interactions, reduction in native species diversity, increase in invasive species, and alteration and increase of disturbance regimes are already causing major shifts in ecosystem processes and an overall decrease in ecosystem resilience. These impacts also increase the risk to humans and wildlife from disease (increased number of outbreaks and disease vector movement into new environments) and disaster (e.g., increase in floods, fires, and drought). It also affects human lives and livelihoods in many other ways, from agricultural production and access to water, to breakdowns in security as climate-vulnerable communities are impacted disproportionately by biological, economic, and disaster-related shocks (Pecl et al. 2017).

### **AZA Actions**

AZA encourages the following strategies and actions for its members to engage zoo and aquarium audiences and stakeholders in mitigating and adapting to climate change in order to build a more resilient and equitable future where people and wildlife thrive together:

## **Field Conservation**

Current wildlife conservation actions, successful in the short term of five to ten years, may well fail in the long term (25 to 50 years) if we do not consider, plan for, and initiate action to adapt to the impact of climate change on habitats, connectivity, behaviors, and movements. Therefore, there is a need to include climate change adaptation planning into our wildlife conservation projects and programs to ensure long-term conservation and wildlife population sustainability (Watson et al. 2011).

Indigenous people and local communities in many conservation landscapes can also greatly benefit from incorporating climate change adaptation and resilience into program initiatives (Maxwell et al. 2015). Many of these communities live in isolated, poorly supported regions and depend largely on natural resources for their livelihoods and their survival. Climate resilience planning is vitally important to ensure that they can continue to support themselves through ecosystem services – food, water, shelter, and income opportunities – that are provided by the landscapes they live in and share with wildlife.

## **Education, Communications, and Climate Literacy**

AZA facilities should engage visitors, audiences, and the broader community in learning and understanding important information about Earth's climate, impacts of climate change, and approaches to adaptation and mitigation (U.S. Global Change Research Program/Climate Change Science Program 2009). Programs and initiatives may be formal or informal. They should leverage the power of our animal exhibits, our conservation and community programs, and our staff expertise as we work with our audiences. Climate literacy and resiliency should be included in education programs, exhibits, and messaging. Education, engagement, and communications staff should be trained on climate science and strategies for communicating effectively about climate change information. Training in the social sciences, including conservation psychology, may assist in moving audiences to action, while assessment and evaluation will help assure efficacy. Climate change education and messaging should engage a variety of audiences onsite and online through social media and other means to raise awareness and encourage both individual behavior and civic change around climate action.

## **Visitor and Community Engagement**

Zoos and aquariums are uniquely positioned to inspire their visitors and communities to address climate-related issues in their region. Engagement to mitigate climate change and its impacts should go beyond individual actions such as plastic or carbon footprint reductions and support collective action and community-level solutions with impacts at a systems level. AZA organizations can support a network of diverse community stakeholders to implement a shared and inclusive climate action agenda, support climate action, and provide tools and resources for other organizations to do similar work. AZA facilities can nurture community partnerships and strategic project growth that includes youth development, advocacy training, and engagement opportunities. Helping to build climate resilient communities can include promoting climate change mitigation, adaptation, and advocacy strategies and actions; fostering youth-led movements that could lead to and advance development of innovative policy strategies and broader support for clean energy solutions; and mentoring on data organization and management, including participation measures.

## **Climate Justice**

The AZA community recognizes that climate change impacts groups differently, and that disadvantaged communities can be affected disproportionately. This is true at the global level between nations that differ in development levels (Patel and Gebreyes 2020), and within countries -- including the larger communities around our facilities -- where climate change can increase the exposure of disadvantaged groups to adverse effects, increase their susceptibility to damage caused by climate change, and decrease their ability to cope and recover from the damage suffered (Islam and Winkel 2017). AZA organizations should build on their role as an active community member and trusted expert to engage and work with communities, especially disadvantaged ones, to learn what their needs are and help co-develop resources that increase their resilience to climate change.

## **Climate Rescue and Rehabilitation**

Zoos and aquariums around the world are already being asked to take in animals injured, orphaned, or made homeless by climate-driven disasters such as fires, storms, and floods. These climate-related

events are expected to grow in number and intensity, and AZA zoos and aquariums should plan for the possibility that their facility may be asked to serve as a site for refuge or rehabilitation of wildlife.

### **Climate Change Policy**

As a trusted association, AZA has significant strength at the federal level and a voice at the international level, and each of our organizations has a history of connection with local communities and government as a long-standing and trusted cultural institution. This gives us the ability to help educate and engage the public, and even advocate directly for policies related to climate change, along with an unparalleled ability to help people understand the connection between how those policies will affect the natural world and our own lives.

### **Institutional Security for Climate Impacts**

All AZA facilities need to address operational continuity and organizational resilience in the face of climate change. This includes anticipating, preparing for, and responding to impacts from events such as wind storms, heat waves, wildfires and related air quality issues, extreme snowfall or floods, power outages, and supply chain disruptions.

The health and safety of animals, staff, volunteers, and guests are a key concern for AZA facilities in responding to natural disasters. Strengthening generator capacity, systems redundancy (IT, HVAC, phone lines), on-site renewable energy production and storage, water re-use, emergency refuge provision, and supply storage capacity will all form a key part of resilience building.

### **Mitigating Climate Impacts from our Organizations**

As our facilities plan for the future, construction (and refurbishment of existing structures) should have climate resilience and sustainability as part of the design and fabrication processes, with the goals of 1) reducing emissions, and 2) increasing on-site renewable energy capacity.

When possible, organizations should consider construction of buildings that have zero negative impact (net-zero emissions, water, net-zero waste) on the site where they are built — and even buildings that actively improve the ecological health of their physical site by restoring more energy and cleaner soils and water than they consume or impact.

AZA organizations are also encouraged to work with vendors and suppliers to reduce the environmental impacts arising from the specification of materials, goods and services.

Waste is another area where AZA organizations can lead in minimizing our economic and environmental impacts. Reducing materials consumption and waste generation saves production inputs, disposal costs and fuel expenditure, and methane at the landfill.

AZA organizations should also look to reduce the demand for water and stress on storm drainage systems and exploit opportunities for on-site water recycling and capture.

AZA organizations should also explore ways to reduce fossil fuel-based transportation to, from, and within zoo grounds.

Finally, a deeper felt sense of “walking the talk” can also lead to better staff satisfaction and retention rates, while increasing the perception of the organization as a model of sustainability and a climate change leader in the region among stakeholders and guests.

### **Summary**

AZA recognizes the collective power of all of these efforts and their ability to decrease contributions to climate change. By exemplifying how to make choices to mitigate climate change, and adapting to the changes that are already underway, we can reduce the risks and overall impact of climate change on wildlife, communities, and our planet, and empower others to take similar action. These actions by AZA-accredited organizations and their collective audience will help protect wildlife and the global ecosystems upon which all life on Earth depends.

## References

- Fraser, J., & Sickler, J. 2009. Why zoos & aquariums matter: Handbook of research key findings and results from national audience surveys. Retrieved from Why Zoos and Aquariums Matter website: [https://wzam.org/wp-content/uploads/Fraser.Sickler.2008\\_Why-Zoos-and-Aquariums-Matter-Handbook.pdf](https://wzam.org/wp-content/uploads/Fraser.Sickler.2008_Why-Zoos-and-Aquariums-Matter-Handbook.pdf)
- IPCC. 2018. Global Warming of 1.5C. An IPCC special report on the impacts of global warming of 1.5C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Pan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. <https://www.ipcc.ch/sr15/>.
- IPCC, 2019a. Climate Change and Land. An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)].
- IPCC, 2019b. IPCC Special Report on the ocean and cryosphere in a changing climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)].
- Islam, S.N. and J. Winkel. 2017. Climate change and social inequality. United Nations Department of Economic and Social Affairs (DESA) Working Paper No. 152 ST/ESA/2017/DWP/152.
- Maxwell, S.L., Venter, O., Jones, K.R., and Watson J.E.M. 2015. Integrating human responses to climate change into conservation vulnerability assessments and adaptation planning. *Annals of the New York Academy of Sciences*, 1355; 98-116.
- Patel S. and Gebreyes B.Y. 2020. What is effective climate adaptation? Case studies from the Least Developed Countries. IIED, London. <http://pubs.iied.org/10209IIED>
- Pecl G.T., Araújo M.B., Bell J.D., Blanchard J., Bonebrake T.C., I-Ching Chen, Clark T.D., Colwell R.K., Danielsen F., Evengård B., Falconi L., Ferrier S., Frusher S., Garcia R.A., Griffis R.B., Hobday A.J., Janion-Scheepers C., Jarzyna M.A., Jennings S., Lenoir J., Linnetved H.I., Martin V.Y., McCormack P.C., McDonald J., Mitchell N.J., Mustonen T., Pandolfi J.M., Pettorelli N., Popova E. Robinson S.A., Scheffers B.R., Shaw J.D., Sorte C.J.B., Strugnell J.M., Sunday J.M., Tuanmu M-N., Vergés A., Villanueva C., Wernberg T., Wapstra E., and Williams S.E. 2017. Biodiversity redistribution under climate change: Impacts on ecosystems and human well-being. *Science*, 355 (6332), 1-9.
- Reed, K.A., Stansfield, A.M., Wehner, M.F., and Zarzycki, C.M. 2020. Forecasted attribution of the human influence on Hurricane Florence. *Science Advances*, 6(1): eaaw9253 doi:10.1126/sciadv.aaw9253
- Sala, E., Mayorga J., Bradley D., Cabral R.B., Atwood T.B., Auber A., Cheung W., Costello C., Ferretti F., Friedlander A.M., Gaines S.D., Garilao C., Goodell W., Halpern B.S., Hinson A., Kaschner K, Kesner-Reyes K., Leprieur F., McGowan J., Morgan L.E., Mouillot D., Palacios-Abrantes J., Possingham H.P., Rechbergre K.D., Worm B., and Lubchenco J. 2021. Protecting the global ocean for biodiversity, food and climate. *Nature*. <https://doi.org/10.1038/s41586-021-03371-z>
- U.S. Global Change Research Program/Climate Change Science Program. 2009. Climate Literacy: the Essential Principles of Climate Sciences: a Guide for Individuals and Communities. Washington, DC. <https://www.globalchange.gov/browse/educators>

Watson, J.E.M., Cross M., Rowland E., Joseph L.N., Rao M., and Seimon A. 2011. Planning for species conservation in a time of climate change. In: Climate Change - Research and Technology for Adaptation and Mitigation, Dr. Juan Blanco (Ed.).

Weiskopf S.R., Rubenstein M.A., Grozier L.G., Gaichas S., Griffis R., Halofsky J.E., Hyde K.J.W., Morelli T.L., Morisette T., Munoz R.C., Pershing A.J., Peterson D.L., Poudel R., Staudinger M.D., Sutton-Grier A.E., Thompson L., Vose J., Weltzin J.F., and Whyte K.P. 2020. Climate change effects on biodiversity, ecosystems, ecosystem services, and natural resource management in the United States. *Science of the Total Environment*, 733. <https://doi.org/10.1016/j.scitotenv.2020.137782>