Animals at risk from heat waves if global temperatures keep rising, says study

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More than 40% of all land vertebrates may be subjected to extreme heat events by 2099 under current maximum estimates of future global temperatures, according to a study published in *Nature*. Prolonged

exposure to high temperatures could be dangerous for the future of many species across the globe.

Extreme thermal events, a period in which the temperature greatly exceeds a historical threshold, have increased in frequency compared to historical records, exacerbated by climate change caused by human activity.

Recurring periods of extreme heat affect wildlife and are associated with increased psychological stress, reduced reproductive output and decreased population sizes, meaning that the continuation of these temperature spikes would pose a substantial threat to future biodiversity.

Previous work to evaluate the consequences of climate change on wildlife has lacked assessments of the short-term dynamics of daily heat stress or the damage that is caused by the variability of temperatures rather than the heat itself.

In their study, Gopal Murali and colleagues map the exposure of around 33,600 land vertebrates to extreme thermal events under various greenhouse gas emissions scenarios by using the projected frequency, duration and intensity of extreme thermal events between 1950 and 2099.

The authors predict that 41% of species will experience extreme thermal events in all three metrics across at least half of their land distribution under a high emissions scenario (in which warming is predicted to reach 4.4 °C).

This percentage is expected to decrease to 28.8% for intermediate–high scenarios (warming to reach 3.6 °C) and 6.1% for low emission scenarios (warming limited to 1.8 °C).

Amphibians and reptiles are likely to be at greatest risk, with 55.5% of amphibians and 51.0% of reptiles expected to experience extreme heat events under high emissions scenarios, as compared with 25.8% of birds and 31.1% of mammals.

Murali and colleagues assert that curbing greenhouse gas emissions would substantially reduce the effect of extreme heat on biodiversity.

More information: Gopal Murali et al, Future temperature extremes threaten land vertebrates, *Nature* (2023). DOI: 10.1038/s41586-022-05606-z

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