Study finds that one in six species are in danger of extinction due to climate change

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25 June 2015

An article published this past April in the journal *Science* predicts that up to one in six animal and plant species on earth are in danger of extinction due to climate change. The study, authored by Mark Urban, an ecologist at the University of Connecticut, concludes that as the global climate warms, the rate of extinction, already high, will accelerate.

Previous studies, dating back more than a decade, have already shown that global warming, which has increased earth's temperature by an average of 1.5 degrees Fahrenheit (0.8 degrees Celsius) since the Industrial Revolution, has had notable effects on species distributions. It pushes species to higher latitudes and higher altitudes, following the cooler temperatures to which they are adapted. Scientific projections indicate that the rate of warming is accelerating, and global temperatures may rise at least 8 degrees F. (4.5 degrees C.), if present trends continue.

Such drastic changes in climate would far outpace the rate at which species could adapt by evolutionary mechanisms. Many would, quite literally, run out of room, reaching the tops of mountains or the far reaches of the northern and southern hemispheres, where ecological crowding and differing environmental settings would drive many to extinction.

Urban's research was based on a reanalysis (known as a meta-analysis) of data from 131 previous studies of species extinction from around the world. He concludes that the rate of increase in extinctions would be greater if temperatures reach the higher end of predicted ranges. With a rise of 3.6 degrees F. (2.0 C.), 5.2 percent of species would become extinct, but with an increase of 7.7 degrees F. (4.3 C.) the extinction rate would rise to 16 percent. Larger changes in temperature can be expected to have even more severe consequences.

It must be remembered that these estimates represent global averages. Regional variations are likely to produce a range of results. For example, studies have revealed that the polar regions are warming at notably more rapid rates than are the lower latitudes. As temperatures in these areas increase, cold-adapted species will simply have no place to go.

Another complicating factor is that there are likely to be synergistic effects. Complex, dialectical interrelationships exist between species in a given ecological setting. In- or out-migration, differing migration rates, or local extermination of key species would quite probably disrupt delicate balances of interdependence, causing a downward cascade of consequences for other species, likely making their situations more fragile and prone to extinction.

Less mobile species and those limited to restricted geographic ranges will be especially vulnerable. According to Urban, the highest rates of extinction are likely to occur in South America (23 percent), and Australia and New Zealand (14 percent each).

The danger is not merely that of the loss of individual species, or even large numbers of species, but of the collapse of entire ecosystems, with incalculable, but no doubt very severe consequences for humans.

Urban's study clearly demonstrates the need for a substantial increase in research on the effects of climate change on species and ecosystems. However, no amount of such research will ameliorate the causes of these extinctions. Furthermore, Urban points out that even species that do not go extinct will suffer major, mostly detrimental consequences due to climate change.

Massive extinctions due to naturally induced climate changes have occurred repeatedly in the past (see: *The Sixth Extinction* by Elizabeth Kolbert). There is a

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widespread scientific consensus that human activity, if present trends continue, is likely to cause disruptions on a similar scale.

However, despite clear warnings of dire consequences, including massive disruptions to human society, business interests and the political structures that represent them have prevented any meaningful efforts to address the activities that are driving the process (see: Climate report warns of “severe, pervasive and irreversible impacts”).

A massive, coordinated scientific and technological effort is needed to avert an otherwise inevitable environmental disaster. That will only be possible, however, if control of the economy is taken away from super-rich corporate interests, whose overriding motivation is short-term profit regardless of the consequences. Only a rationally planned socialist program based on the interests of the working class, including the need for a livable planet, can address this crisis.

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