



Canyon Nature

Climate change & unforeseen consequences

The climate crisis is causing unprecedented changes, including extreme heat, sickness, rising seas, and bigger storms. The most vulnerable groups are the elderly, underprivileged, and children. Extreme heat strains the electrical grid, increasing the risk of blackouts and heat exhaustion. Crops suffer due to reduced yields and nutritional value, while livestock production suffers from reduced fertility and reduced resilience to disease. Heatwaves also impact food storage and transportation, leading to increased prices for consumers.

Children's educational opportunities are also affected, with 41% of schools lacking adequate cooling or ventilation, leading to early dismissals and cancelled sessions. Heat-related injuries and pausing work for safety increase productivity losses and costs, amounting to up to \$311 billion USD per year. A warmer planet may also lead to higher crime rates, with impoverished communities being most affected. The NOAA is working to ensure resilience in social, ecological, and economic systems as the earth heats.

Plants and animals will also encounter new environmental conditions. For six years I kept track of the snakes I encountered in and around Green Valley and Sahuarita (2015-2020). The most encountered snake was the Western Diamondback Rattlesnake, *Crotalus atrox* and I encountered this species 100 times in six years. Climate change will have many unforeseen consequences for organisms. Ectotherms like reptiles may be active more of the year and require more food. It may alter incubation times, and thus allow females to have more offspring per year. Extreme temperatures may outright kill adult animals.

Embryos incubated at higher than normal temperatures may also have unexpected anomalies. A striped pattern as opposed to blotched pattern is one of those unexpected consequences (see the next page). Snake embryos incubated at higher than normal temperatures will often have a striped pattern. This may have no effect on the survival of the animal - but it could. A striped

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Above the neonate rattlesnake on top has a stripe on the forebody that becomes blotches that have fused and are perhaps on their way to becoming stripes. The neonate (new born) at the bottom has a normal color pattern for a Western Diamondback Rattlesnake resulting from developing at a cooler pattern of blotches.

pattern may make the snake more visible to predators or less attractive to the opposite sex.

Extreme temperatures that exceed the critical maximum temperature for snake species range from 100.4 to 111.2 °F and vary with the species. At the critical maximum the animal cannot function- it cannot turn itself over if it is placed upside down. Many turtles, all crocodilians, and many lizards have their sex determined by the temperature of the embryo at a critical period during development. Climate change will alter the sex ratios of many of these populations. (Continued in the caption below the photos.)