

Climate Change documents from the Conservation Breeding Specialist Group, SSC, IUCN (Reprinted with permission from CBSG)

The Conservation Breeding Specialist Group has brought out two papers which provide excellent information to address one of the most frightening current threats to our entire world, e.g. climate change.

In the zoo context WAZA, the World Association of Zoos and Aquariums set up a Task Force in 2009 with key organisations such as IUCN, CBSG, BGCI (Botanical Gardens Conservation International) and ZSL (Zoological Society of London) as per logo below. WAZA sponsored a petition supported by 200 zoos that officially signed on to this initiative and crafted a Position Statement. A list of WAZA and CBSG Climate Change inputs is included on pp. 15-17.

Zoos and other GO's and NGO's as well as some industries around the world have taken up the challenge of confronting, researching, publicizing and attempting to tackle the problems created by this phenomenon.



Climate Change & Wildlife

Compiled by CBSG

There is a strong consensus among climate scientists that the climate on Earth is changing and that humanity's burning of fossil fuels is the leading cause. Not only does climate change affect humans, but it impacts the world's plant and animal species as well. Climate change has already influenced nature in many ways, and as it progresses it will become a primary driver of species extinction.

The following is a list of ten concerns related to climate change for nature and species. These threats are often interconnected and can exacerbate the many other existing threats to wildlife such as habitat loss and fragmentation, invasive species, and disease.

Ocean Acidification

We can only blame ourselves for the 30% drop in the pH of oceans—they absorb nearly a third of the carbon released into the atmosphere through human activity. This acidification renders some crustaceans and coral unable to produce their protective shells and skeletons. Coral reefs, which serve as habitat for 1000's of marine species, are being destroyed by bleaching due to ocean acidification. This destruction of marine life is a threat to the entire ecosystem . . . humans included!

Extreme weather events

We've all seen the headlines. 2012 was the hottest year on record in the US. Massive heat waves and drought have already grown more prevalent across the globe, expected to become more severe if the warming trend continues. In drought areas, habitats are altered, and plants and forests suffer from the lack of water. Increased wildfire activity due to hot, dry conditions poses a risk for safety of wildlife. It destroys important wildlife habitats, like the nesting habitat for Mexican spotted owls and forest habitat of endangered Amur tigers and critically endangered Amur leopards in Russia. Stronger and more frequent storms affect the distribution and concentration of the low links on the

marine food chain—plankton and krill—thus having a domino effect on many ocean species.

Melting Sea Ice

Arctic temperatures are rising twice as quickly of the rest of the world and sea ice is melting at an alarming rate. Some of the world's iconic species like polar bears, ringed seals, emperor penguins, and beluga whales all experience distinct pressures due to melting sea ice. For these and other species, disappearing ice disrupts the food chain, hunting habits, reproduction, protection from predators, and the ability to travel long distances--in other words, the foundations of their existence.

Sea-Level Rise

Sea level rise as a result of expanding warm seawater and melting glaciers will cause disappearance of coastal habitats for birds and sea turtle nesting sites. Whole islands could disappear under the sea, taking terrestrial species with them. For example, the low-lying Florida Keys habitat of the Key deer may be completely swallowed by the sea. Human-constructed defenses against sea level rise will impact habitat of coastal species like the West African Manatee.

Disease and Pests

Not only does climate change affect disease in human populations, it also alters the disease behavior in animals as well. The devastating amphibian disease chytrid fungus, likely exacerbated by warmer temperatures, has left many amphibian populations dwindling or extinct. Seasonal pests, like bark beetles in the US, breed longer in warmer weather and thirsty, drought-affected trees are more susceptible to infestation.

Range Shift

Ecological communities of plant and animal species—called "biomes"—are shifting as the planet warms. Some species are able to adapt and move while others cannot, and these will disappear with their disappearing habitat. Those that shift upslope to follow shifting habitats, like the American pika and mountain gorilla, can only go on so far before they reach the summit.

New Species Interactions

The climate-induced variation of species' range and related biome shifts cause previously unacquainted species to come into contact with each other. This results in competition for resources and changes in the way predators interact with their prey. For example, red foxes have moved northward toward a warming tundra and compete for prey with native Arctic foxes.

Invasive Species

Climate change and invasive species are two major threats to biodiversity. Put them together and the repercussions are projected to be widespread. Climate change will provide new ways for invasive species to encroach on new territory. Natural disasters like storm surges and high winds, which increase in number and severity as the earth warms, spread non-native plants and insects to new territories. For example, the winds of the 2005 hurricane season likely introduced cactus moths to Mexico, where their presence threatens endemic cactus species.

Interrupted Seasonal Cycles

So many species are dependent upon climate to guide the patterns of their lives—like mating, reproduction, hibernation, and migration, to name a few. As these patterns shift to reflect changing climate, it causes a ripple effect and hampers the health of the entire ecosystem. The altered timing of animal behaviors that are guided by

weather—such as migration by birds, hibernation for bears, bats, and even alligators—will result in mismatched timing between species and their food sources. For example, caribou migration patterns have been disrupted by an earlier flowering season of their plant food source, leading to food shortage late in the season and depleted number of offspring.

Changes in Human-Nature Interactions

Melting sea ice opens the Arctic for oil drilling, bringing ships into previously untouched territory of Pacific walrus. Expansion of agriculture and the need for water will lead humans to infringe on native wetlands, destroying habitat of countless plant and animal species. Increased drought activity will force koalas out of the safety of eucalyptus trees in search of water, exposing them to risk of death from road traffic.

This list provides evidence of the significant effects on nature resulting from climate change. Although these facts are frightening and the journey ahead challenging, there is hope. By taking the difficult but necessary steps to decrease carbon emissions, we can give the world's species hope of a livable planet. (Special thanks to our friends at the Conservation Breeding Specialist Group for compiling this factsheet).

Brown Polar Bears, Oh My!

Sally Walker

This short note has been culled (poached) from an article by Bob Weber, from the Canadian Press, 15 March 2013. Photograph by: John Lucas, Edmonton Journal (on another page). See and read it all (and weep) at http://www.edmontonjournal.com/story_print.html?id=8102444&sponsor=

Recently documented research indicates that some clusters of polar bears might turn brown as a result of their changing habitat due to climate change. It is not known exactly how polar bears became white in the first instant but scientists poking around in the evolutionary history of bears, as such, have been hoping to learn why the colours black, brown, and white natural to bears showed up where they did and how. Beth Shapiro, one of the authors of the study published in the journal PLOS Genetics, opines that colour changes could occur in contemporary bears as their habitat changes due to climate changes.

There is a group of brown bears that might suggest a link. They are called ABC bears because they live in the Admiralty, Baranof and Chichagof Islands on coastal Alaska. Earlier studies of the ABC Brown bear DNA indicates that polar bears are more closely related to them than other brown bears. Using DNA analysis they determined that the ABC bears were more related to polar bears because they used to BE polar bears, e.g. a vestige of the last Ice Age population of polar bears. When the Ice Age ended that group was separated from other polar bears and as the weather warmed up male brown bears swam across the waters from the Alaska mainland and found the trapped polar bears with whom they mated.

Simplifying the scientific explanation to its bare bones and playing with scientific fire, these polar bears didn't have enough of the right stuff, DNA, to maintain their racial qualities and they morphed into brown bears. What make this very interesting is whether we fully follow the science or not is that climate change is melting sea ice and over time (a lot of time perhaps) changes polar bear habitat to brown bear habitat and the polar bears are just going to become brown bears. Shapiro comments on the adaptability of polar bears that permits them to hybridize with the brown bears. Instead of being a good thing all around, as adaptability is normally considered, it is a "kind of a shame" for polar bears, says Shapiro. NOT just polar bears! Also for people who love polar bears. Something magical and miraculous will leave the world along with the polar bears.