

## CLIMATE TALK

### Climate Change and Endangered Species

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For most of my career, I worked as a wildlife biologist or refuge manager. Among the most enjoyable aspects of my job was working in special habitats across the continent. Most assignments included working with endangered species -- the plants and animals that are at risk of extinction -- as well as a diversity of other species that enhance our quality of life. Consequently much of my work involved implementing the provisions of the 1973 Endangered Species Act (ESA). Few other laws have afforded such significant protections to our planet's most vulnerable species.

In 1973 I was in Florida where my office and other federal/state resource agencies were attempting to deal with the environmental effects of that state's ongoing development boom. At that time, our office was primarily concerned with habitat loss, environmental contaminants, and over exploitation. Some of the species with which I worked included: American alligator, Florida panther, Florida manatee, Key deer, and Florida snail kite. Climate change was a distant background issue, not on our radar.

Since then, the concentration of carbon dioxide in our atmosphere has risen from approximately 330 parts per million (ppm), to nearly 402 ppm today. Sea level along the U.S. mid-Atlantic and parts of the Gulf of Mexico coasts has risen more than 8 inches since 1960. The average global temperature on Earth has increased by about 1.4 degrees Fahrenheit since record keeping began in 1880. Two-thirds of that warming has occurred since 1975, at a rate of roughly 0.3 degrees per decade. The National Oceanic and Atmospheric Administration recently reported that for the 19th consecutive year, the annual average temperature for the contiguous U.S. was hotter than the 20th Century average. Last year, 2015, was the hottest (globally) on record, beating the previous all-time global record set in 2014; and was the second hottest year in the contiguous U.S. since record-keeping began.

There were approximately 80 species protected when Richard Nixon signed the 1973 ESA into law. Today, more than 2,200 plant and animal species are listed as endangered or threatened (US and foreign) under the Act. Of these, 1,590 occur in the United States. Most of the currently listed species received ESA protection because of factors such as habitat loss, over

utilization, disease or predation. Not until 2008, with the listing of the polar bear, was a high profile species listed due to factors related to climate change; that being, decreasing sea ice.

Among the several listed species with which I worked in Florida four decades ago, biologists now recognize that climate change is also a threat. For example, although manatees prefer warm water, increasing ocean and estuarine water temperatures are triggering increased toxic algae blooms that has killed many manatees. A large portion of Key deer and Florida panther habitat is lowland that is threatened by inundation due to sea level rise.

Climate science indicates that the underlying cause of projected and ongoing habitat changes is the accumulation of heat-trapping carbon dioxide and other greenhouse gases in the atmosphere. If the rate of greenhouse gas emissions continues, the planet's average temperature is projected to rise an additional 2 to 11 degrees by the end of this century. The climate change will cause increases in lake, river and ocean temperatures, ocean acidification, extreme weather events, variable and/or inconsistent weather patterns, increasing sea levels, and disruption of oceanic food webs.

Certainly there will be winners and losers among species as the effects of climate change are manifest. Some species are more adaptable than others. These will move, adapt or evolve to changing conditions. But, biologists predict there will be too many losers. Many species cannot move or otherwise adapt to such rapidly changing environmental conditions. The ultimate consequence on these plant and animal species is extinction. A recent study found there is a high probability that 16 percent of all plant and animal species on the planet would be threatened by extinction with 4 degrees of atmospheric warming-- a rate 1000 times greater than before human habitation. A National Audubon Society analysis suggests that nearly half (314) of all North American bird species are imperiled by changing climate.

Recent polls indicate a majority of voters in the U.S. believe climate change is real and is human caused. However, many people remain uncertain about how a changing climate will affect them personally, or what they can do about it. What to do? Although the scope of the problem may seem overwhelming, there are energy smart actions that individuals can take, that collectively, can make a difference; such as: Strive to consume less. Be energy smart and efficient in your daily life at home, work and travel. Talk to your children about what we buy, how we get and use our energy, and how it affects them and everyone else. Express your concerns about climate change to your local, state and national government officials and support appropriate legislation to reduce carbon emissions. And, you can be active in organizations committed to helping solve one of the most severe threats that our planet is facing.

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