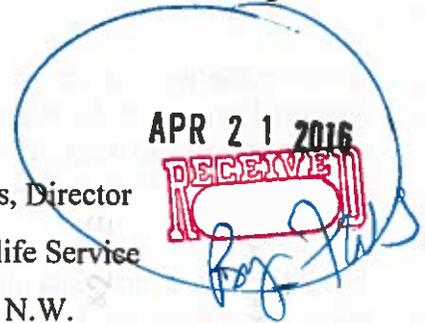


TOPIC: The American Pika

PETITION TO:

Sally Jewell, Secretary
Department of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Steven A. Williams, Director
U.S. Fish and Wildlife Service
1849 C Street, N.W.
Washington, D.C. 20240



PETITION FROM:

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Figure 1a: Young *Ochotona princeps*



Figure 2b: Mature *Ochotona princeps*

I. Introduction

My name is Timothy Eng and I am a junior at Byram Hills High School in Armonk, NY. I am writing to bring to your attention the crisis facing the American pika (*Ochotona princeps*, see figures 1a and 1b) which is directly related to the global warming/climate change crisis. I am also petitioning to get the American Pika listed as endangered under the Endangered Species Act. I was first introduced to the American pika when I saw them in their habitat in the Rocky Mountains, and I have realized how important they are to the ecosystem and biodiversity.

The American pika species and its subspecies are in more trouble than other species that are listed, and yet they are not being protected. A notable petition from the Center for Biological Diversity was submitted in Oct. 2007; however, a press release in 2010 stated that Endangered Species Act protection for the American pika was not warranted. The International Union for Conservation of Nature also assessed the pika in 2011 and declared that the pika was a species of "least concern". The petition included useful information about the pika itself and thus I will refer to it throughout my petition. It has been nearly a decade since the petition was submitted and the studies provided in the petition were not enough evidence to get the pika listed. However, since many new studies and reports have made regarding global warming and the threat to the American pika, the data produced by more recent studies will hopefully demonstrate that there is a much larger threat to the American pika compared to a decade ago.

As some background, I will provide information that was included in the CBD 2007 petition, in addition to some of my own. The American pika is a small mammal related to rabbits and hares that inhabits high elevation talus fields in alpine and subalpine areas throughout western North America. Pikas are solitary creatures and spend little time interacting with other animals, including members of their own species and even family; as early as four weeks old the young become intolerant of and spend little time in contact with their siblings and mother. For most of the summer, they gather hay/grass piles and hide them in the talus slopes to eat throughout the winter; these same holes in between rocks also serve as their home. They have thick fur coats that help keep them warm during the winter. During the summer,

however, the fur coat can become a problem. Pikas are extremely temperature-sensitive and are restricted to cool, moist microhabitats on higher peaks, mainly at heights of 8,000 to 13,000 feet. In the northern part of its range, the pika is found at elevations from near sea level to 3,000 meters. In the southern limits of its distributional range, American pikas are rarely found at elevations lower than 2,500 meters.

It is important to note that *although American pikas can live around 6-7 years, many die after 3 or 4 years*. This death rate is due to the two main threats to the American pika: **global warming**, which leads to the second threat, **habitat loss**.

According to the 2007 CBD petition, the impacts of global warming on pika populations include:

- 1) higher summer temperatures may inhibit successful juvenile dispersal and preclude midday foraging, preventing pikas from gaining sufficient body mass and collecting enough vegetation to successfully overwinter
- 2) diminished snowpack is lowering the protective insulation for the pika during the coldest winter conditions
- 3) temperature and precipitation changes may alter the composition and relative abundance of vegetation in and around talus areas to a mix of plant species which are less favorable for pikas
- 4) the pika's meadow foraging habitat is shrinking as timberlines move upslope due to rising temperatures
- 5) reductions in alpine permafrost may lead to degradation and eventual loss of talus habitats
- 6) changing climate conditions may make pikas more susceptible to predators and disease
- 7) rising summer temperatures may exceed the low thermal limits of the pika and make the talus habitat inhabited by pikas so hot that they can no longer survive

Note that the last three impacts are all related to habitat loss. Pikas cannot survive if they are exposed to temperatures above 25.5°C (77.9°F); they will die *within six hours*. The ones that are better adapted will be able to survive closer to six hours, however, and will be able to move to cooler temperatures. If they do, they must move further up the mountain to do so, because moving down leads to warmer temperatures. However, they will eventually *run out of mountain to climb up*. When they do, the subspecies of pika stranded on little island-like mountaintops, and eventually the overarching American pika species, will die out.

II. Drastic Global Warming changes turns for the worse between 2007 and the present

I would now like to present more recent evidence that will show that dramatic changes have occurred between the time the 2007 CBD study and the present; since changes have occurred with the environment that affects the pika, then a change should be made reevaluating the pika as qualified to be listed under the Endangered Species Act.

To answer the question, "*Should the pika be listed under the Endangered Species Act?*", it is required of course to look at the following criteria and see if at least one of the following is happening:

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms;
- (E) other natural or manmade factors affecting its continued existence.

To get to the crux of the issue, I will analyze the criteria and show that this is true for the pika. First off, global warming has become increasingly more of a threat over the past decade.

According to the Carbon Dioxide Information Analysis Center, in 2007, the time the CBD petition was written, carbon dioxide emissions were about 8,532 million metric tons. According to Energy.gov, in February of 2016, the carbon dioxide emissions were about 11,970 million metric tons. This is *an increase of 3,438 million metric tons over 9 years*. When comparing this to the change in emissions over 9 years in the past, like 1993-2002, or 2002-2011, *there was only an increase of 859 or 2,457 million metric tons, respectively*. This is a *2579 or 981 million metric ton difference in the increases, respectively*.

For comparison, as a reminder, according to the EPA, one metric ton of CO₂ is released to the atmosphere for every 103 gallons of gasoline used; or, using up 40 barbeque propane canisters is the equivalent of releasing a ton of carbon dioxide into the atmosphere.

This increase in emissions most likely led to 2015 becoming the hottest year on record. A New York Times article published in September 2015 stated that it “was the hottest September on record, and in fact took the biggest leap above the previous September that any month had displayed since 1880.” The temperature increase from 2014 to 2015 was about 1.5 degrees Fahrenheit, whereas 2013 to 2014 was about 1.2-1.3 degrees Fahrenheit (see fig. 2). Relatedly, NASA also stated in the November of 2015 that carbon dioxide emissions had risen above levels not seen in hundreds of thousands of years. This clearly demonstrates that within even the last year, temperature increase, which is one of the biggest threats to the pika, has changed drastically compared to years past.

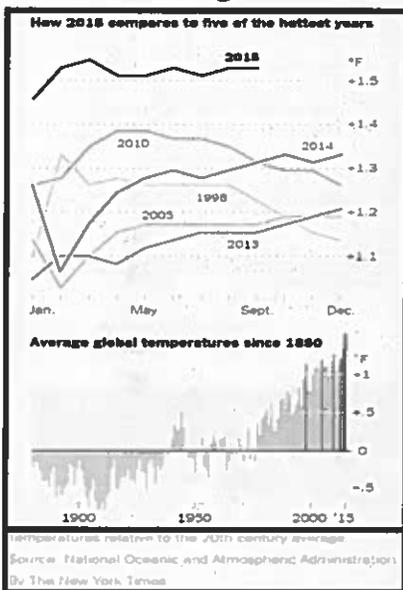


Figure 2: NOAA chart demonstrating annual temperature changes

In addition, various models have produced scenarios regarding temperature change that will most likely affect the pikas. A 2009 model from the United States Global Change Research Program (USGCRP) predicts that there will be an increase of about 8-10 degrees Fahrenheit by the end of the century. A different model, a 2013 Intergovernmental Panel on Climate Change (IPCC) prediction scenario, shows that the temperatures in the regions inhabited by the pikas (Rocky Mountains and westward to the Pacific) will experience an increase of about 15 degrees Celsius/30 degrees Fahrenheit in the next 100-200 years. (see figures 3 and 4 on next page). However, all the models mostly agree regarding the fact that *a major temperature increase will occur*. I will return to more climate models later.

There are also many discrepancies between models and the actual observed amount of emissions during a given year. For example, according to a model from the US Energy Information Administration, by the end of the century, global carbon emissions in 2010 would have been 10 billion tons of carbon dioxide. However, the *actual emissions were three times more- 30 billion tons* of carbon dioxide (see figure 5 on next page). It is apparent here that the predictions are far off from the actual emissions. This trend has also occurred with other models too. This will most likely occur also with current models, which means that by the end of the next century or two, temperature increase will most likely be significantly more compared to the predictions, including those I described above.

Projected Temperature Change (°F)

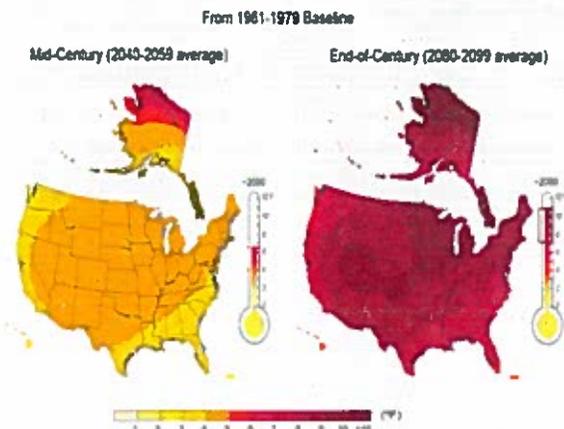


Fig. 3 USGCRP 2009 model

Annual mean surface air temperature change

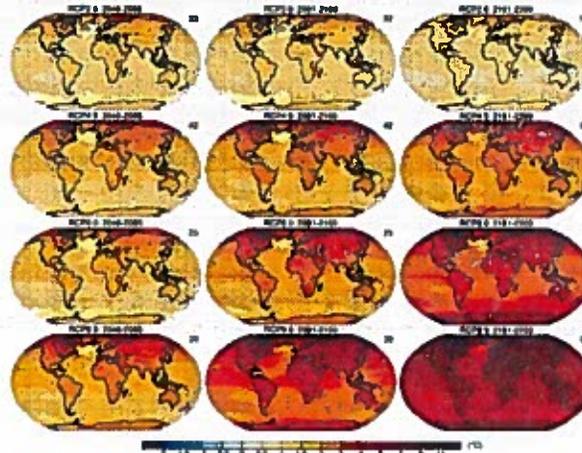


Fig. 4 IPCC 2013 model

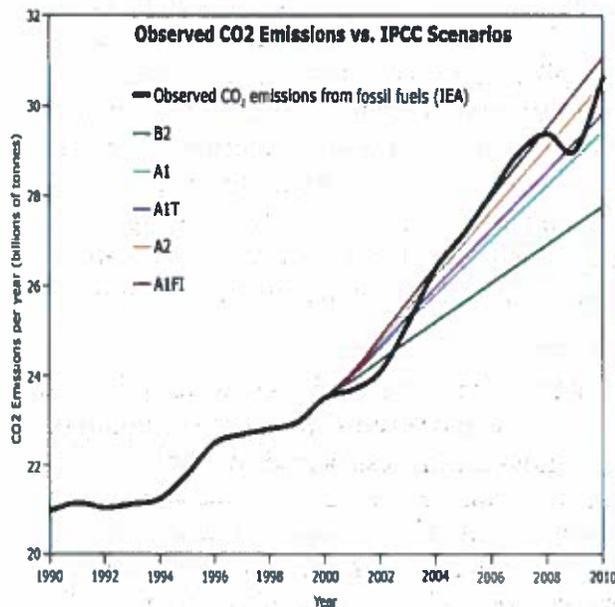


Fig. 5 Model discrepancies from the actual

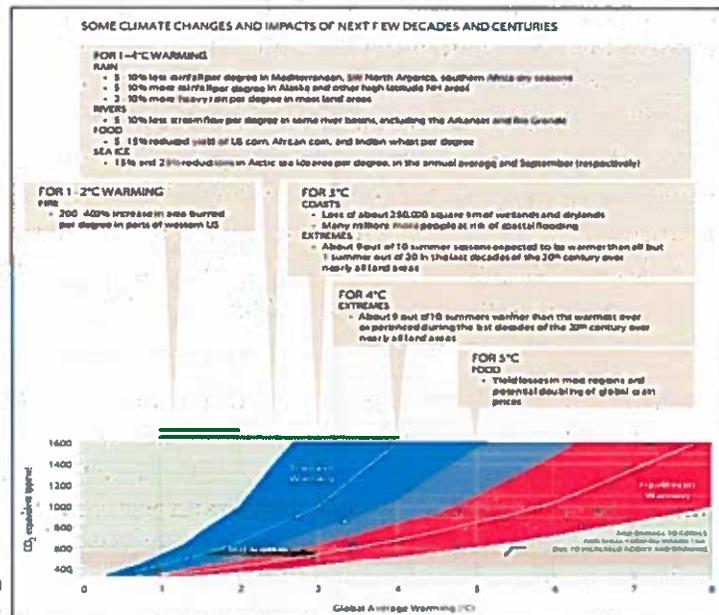


Fig. 6 NRC global warming predictions by increase in temperature (°C)

Climate change will also affect levels of precipitation, most importantly the amount of snow. According to a 2011 NRC report (Climate Stabilization Targets: Emissions, Concentrations, and Impacts Over Decades to Millennia), Northern Hemisphere snow cover will decrease by about 15% by 2100. It also stated that the snow season will continue to shorten, and snowpack will decrease in many regions. For more impacts, see figure 6. In addition, according to the EPA, “between 1972 and 2014, the average portion of North America covered by snow decreased at a rate of about 3,100 square miles per year”.

III. How the pika is impacted by global warming

I will now analyze the effects on the pika of the global warming changes described above. I will mainly focus on criteria (A), which asks if there is the present or *threatened* destruction, modification, or *curtailment* of its habitat or range, and criteria (E), which asks if there are other *natural or manmade factors* affecting its *continued existence*. I will also show that the decision made regarding the 2007 CBD study was correct, but now, the pika should be reevaluated.

First, the increase in carbon dioxide emissions and its impact on temperature change. As I mentioned on the top of page three, there was a difference of 2579 or 981 million metric tons between the increase over three different sets of nine-year periods. This shows that the more recent time frames have greater increases in carbon dioxide emissions. Given this trend, it will be highly likely that there will be greater emissions in the upcoming decades. Humans have, as I said earlier, exceeded carbon dioxide contents in the air *from hundreds of thousands of years ago, before the Chicxulub asteroid*.

This increase in carbon dioxide emissions will lead to higher temperature increases than predicted. This point is also strongly supported by the fact that I mentioned earlier that models involving climate change often underestimate, such as the US EIA's model that estimated 1/3 the actual emissions. Higher temperatures increase will also definitely harm the pika populations. Current temperatures in the regions that the pikas live in are around a little bit above freezing (0-10 Celsius, 30-40 Fahrenheit). The current models predict temperature increase that will get close to the pika's survival threshold. Increases of about 20-30 degrees Fahrenheit in the next century or two will bring temperatures in the pikas' range to around 70-80 degrees, which is the highest temperatures that they can survive at. In addition, there have been trends in the past, as I showed earlier, that the models were not correct; and that they were underestimates of the real values (be it temperature, carbon dioxide emissions, etc.). So, it is highly likely that the temperature increase *within the next century or two* will be enough to push temperatures in the regions where the pikas are living *above the survival threshold*. This means that pikas will be threatened in the near future.

Returning to the decrease in snowfall, it will cause loss of habitat for pikas also. Snow, which of course is associated with winter and the cold, help the pika survive because more snow means the bringing of the cool temperatures that the pika is better adapted for. Less snow means less periods of cool temperature. Less periods of cool temperatures means hotter temperatures. Longer periods with hot temperatures means more stress on the populations. More stress means higher mortality rates, and eventually communities will die out, especially the ones at lower elevations on the mountains where there is less snow. When communities die out, this will lead to entire subspecies that is comprised of only a few communities going extinct. *9 out of 25 subspecies have already disappeared*.

Looking at criteria A, it is evident that there is definitely curtailment of the range of the pika. Snow levels will decrease, and the temperature threshold is rising. *The pikas are running out of room to run*. Looking at criteria E, you can see that this is true also. *Manmade factors are threatening the pikas' continued existence, namely, greenhouse gases such as carbon dioxide*.

So the answer to the question regarding the pika is Yes! It is *scientifically supported, by mainly climate models*, that the American pika, *Ochotona princeps*, qualifies to be listed under the Endangered Species Act.

IV. Why being listed will help the pika (and other species) the most

The US Fish and Wildlife Service has classified *Ochotona princeps barnesi*, *Ochotona princeps cinnamomea*, *Ochotona princeps clamosa*, *Ochotona princeps lasalensis*, *Ochotona princeps moorei*, *Ochotona princeps nigrescens*, and *Ochotona princeps wasatchensis* as species of concern. However, it would be beneficial to the American pika species as a whole if all of the subspecies would not just have their populations monitored but also be protected as threatened under the Endangered Species Act.

Of course, a possible solution to the threat to the pika (and the threat to every other species on the planet) would be to decrease/lessen global and gases emissions, but of course this is not feasible nor practical. A more useful and immediate solution would be to get the pika classified as endangered and thus be under the protection of the Endangered Species Act.

Since one of the notable protections is that the Endangered Species Act protects against “interfering in vital breeding and behavioral activities or degrading critical habitat” (NWF), the federal government would technically have to more strictly regulate gas or temperature-raising chemical emissions. To use the words of the 2007 CBD petition, this “immediate greenhouse gas reductions at the state and federal level”, *would help the pika and other species as well, along with the human race and the entire planet.* Since the pika is one of the first species that would require direct regulation of greenhouse gases, this regulation would help benefit future species also. To use two other important benefits of Endangered Species Act protections in the CBD petition, it would involve “facilitating pika adaptation to climate change, and monitoring pika populations and their habitat,” to make sure that the populations would recover and hopefully increase again.

V. Conclusion

The pika is an extremely important part of biodiversity. They both provide sustenance for the predatory species such as weasels, stoats, and various hawks, and they also control the grass populations. They are fun to watch run around and collect grass. I have seen it in its natural habitat and watched it interact with the environment. I first saw the pika at Rocky Mountain National Park. Over the years I have gone to RMNP a total of three times, and each successive time I have seen firsthand the decline in populations. The pikas at RMNP live in a certain location on the mountain side, and every time I have gone, I have seen the decline in pikas. The first time I went, there were at least 20-30. The second time, 15-20. The most recent time, maybe 10 at most. The pika as a species really help to show to people that visit national parks how important nature is and protection of the environment is. If actions are not taken, then the pika species will go extinct, adding it to the minimum 10,000 species that go extinct year, many of which we don't even know about. The World Wildlife Foundation sums up the danger of extinction:

If there are:
 - 100,000,000 different species on Earth
 - and the extinction rate is just 0.01% / year
 - *at least* 10,000 species go extinct every year

Figure 7. WWF estimate for species extinction

The loss of biodiversity, *including the pika*, will weaken the planet and everyone on Earth, human or not.

Again, I urge you reevaluate the American pika for listing under the Endangered Species Act.

Yours sincerely,

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