

PETITION

**TO THE
WORLD HERITAGE COMMITTEE
REQUESTING INCLUSION OF**

WATERTON-GLACIER INTERNATIONAL PEACE PARK



**ON THE LIST OF
WORLD HERITAGE IN DANGER
AS A RESULT OF CLIMATE CHANGE AND FOR
PROTECTIVE MEASURES AND ACTIONS**

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To: The World Heritage Committee
c/o The Secretariat, World Heritage Centre
United Nations Educational, Scientific, and Cultural Organization
7 Place Fontenoy, 75352, Paris 07 SP, France

Notice of Petition

The International Environmental Law Project and other petitioners request the Secretariat and members of the Intergovernmental Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value (World Heritage Committee) to list Waterton-Glacier International Peace Park on the List of World Heritage in Danger pursuant to its authority under Article 11, paragraph 4 of the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention).

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Petition to List Waterton-Glacier World Heritage Site as World Heritage in Danger Due to Climate Change

**Prepared by the International Environmental Law Project
Lewis & Clark Law School
February 16, 2006**

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Executive Summary

This petition is a request to include Waterton-Glacier International Peace Park on the List of World Heritage in Danger. Petitioners are concerned that climate change threatens the features of the site that warranted its World Heritage listing in 1995. Of utmost concern is the rate at which the renowned glaciers in Glacier National Park are melting. In fact, less than one fifth of the park's glaciers still exist—and those precious few that remain are melting rapidly due to human-induced climate change. As a Party to the World Heritage Convention, the United States is obligated to “do all it can . . . to the utmost of its own resources” to protect and conserve the natural heritage situated within its boundaries.¹ A listing on the List of World Heritage in Danger highlights the threat of climate change to mountain ecosystems generally and to Waterton-Glacier International Peace Park specifically and also provides impetus for actions by the United States to curb its greenhouse gas emissions to slow the damaging effects of climate change.

The World Heritage Committee identified six characteristics of Waterton-Glacier International Peace Park warranting its listing as a World Heritage Site. Of these, four face serious and specific ascertained dangers due to climate change. First, Waterton-Glacier's distinctive climate system is threatened with rising temperatures and decreasing precipitation. Average summer temperatures have increased 1.66°C between 1910 and 1980, and precipitation levels have decreased by as much as twenty percent in the area around Waterton-Glacier. Second the loss of more than eighty percent of the park's glaciers is the result of climate change. Since 1850, the area covered by glaciers in the park has decreased by seventy-three percent and continues to decrease. The mountain ecosystems of Waterton-Glacier, including the park's glaciers, were a primary reason for its World Heritage listing. Due to the receding glaciers, Waterton-Glacier's unique tri-ocean hydrological system is threatened. The loss of the glaciers will result in a loss of streamflow, which affects all animal species dependent on the park's water resources. Further, the species that compose the vast biological diversity of Waterton-Glacier's mountain and prairie ecosystems are threatened by climate change. Increasing temperatures triggers species redistribution and causes regional extinctions. Already, scientists have noted that alpine treelines are moving upward. Finally, the culmination of all these effects detracts from the cultural and aesthetic values of Waterton-Glacier.

Moreover, Waterton-Glacier faces the potential danger of inadequate management because the park managers—on the U.S. side, the National Park Service—do not have the authority to address the cause of the ascertained dangers facing Waterton-Glacier—namely, greenhouse gas emissions. As such, the Parties to the World Heritage Convention, and especially the United States, should reduce global greenhouse gas emissions in order to fulfill their obligation to pass world heritage on to future generations.

A program of “corrective measures” is an important result of a World Heritage in Danger listing. Petitioners suggest that these corrective measures should focus on reductions in U.S. greenhouse gas emissions because the glaciers, which are so rapidly melting, are within the

¹ Convention Concerning the Protection of the World Cultural and Natural Heritage, art 4, *signed* Nov. 16, 1972, *entered into force* Dec. 17, 1975, 15 U.N.T.S. 511.

U.S.'s territory, implicating the obligation of the World Heritage Convention to conserve and protect natural and cultural heritage within a Party's boundaries. Petitioners suggest several measures that could be effective parts of such a program.

Because electricity generation accounts for thirty-nine percent of all carbon dioxide emissions, a program of corrective measures should include a plan to reduce reliance on coal to produce electricity through the promotion of alternative energy sources, like wind power. In addition, a significant corrective measure could be regulation of emissions from coal-fired power plants; this could be achieved efficiently and economically with a cap-and-trade program for carbon dioxide emissions. Moreover, a program of corrective measures could achieve significant progress toward reducing greenhouse gas emissions if it included transportation sector reductions, including increases in fuel efficiency standards, regulation of tail-pipe emissions, and increased reliance on non-petroleum-based fuels, like ethanol and biodiesel. Finally, the World Heritage Committee could also include programs aimed at achieving greater energy efficiency through appliance efficiency standards.

Waterton-Glacier's status as an International Peace Park underscores the importance of the international nature of environmental treasures and the cooperation necessary to protect it. That cooperation is needed now, more than ever, and Petitioners urge the World Heritage Committee, the global community, and especially the United States and Canada to work together to preserve the natural and cultural heritage of Waterton-Glacier International Peace Park. If action is not taken, scientists predict the glaciers will have disappeared by 2030. As former U.S. Secretary of the Interior Bruce Babbitt said in 1998, "It's increasingly hard to understand why it's called Glacier National Park, because the glaciers are getting hard to find."

I. Introduction

The International Environmental Law Project and other petitioners request the Secretariat and members of the Intergovernmental Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value (World Heritage Committee or the Committee) to list Waterton-Glacier International Peace Park on the List of World Heritage in Danger pursuant to its authority under Article 11, paragraph 4 of the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention).² Due to climate change, Waterton-Glacier World Heritage Site faces serious and specific ascertained and potential dangers that are threatening the characteristics for which the park was listed as a World Heritage Site.

In 1932, Canada and the United States combined Waterton National Park in Alberta, Canada and Glacier National Park in northwestern Montana to create the first International Peace Park. Waterton-Glacier is traversed by the Lewis Mountain Range, the narrowest section of the Rocky Mountains, and contains twenty-seven glaciers and many more perennial snowfields, outstanding glacial lakes, and prairie, forest, and alpine habitats. The park supports an exceptional diversity of plant and animal species and is home to many predators, such as grizzly bears, wolves, and mountain lions. In fact, the Glacier National Park portion of Waterton-Glacier is the only area in the contiguous forty-eight United States where all of these species still occur naturally.³ The park's position in the western Cordillera of North America⁴ has led to the evolution of unique plant communities and ecosystem complexes that do not occur anywhere else in the world.⁵

The uniqueness of Waterton-Glacier led the World Heritage Committee to designate it as a World Heritage site in 1995 for a number of reasons. For example, Waterton-Glacier exists at a climatological crossroads where Pacific weather systems mingle with warm air masses from the south and east and cold weather from the north. These weather systems contribute to the unique flora found within Waterton-Glacier. In addition, Waterton-Glacier contains adjacent mountain and prairie ecosystems. The park's glaciers, once numbering 150, provide Waterton-Glacier with tremendous scenic and aesthetic value, which contributed to the park's World Heritage status. Finally, the status of Waterton-Glacier as the first International Peace Park is culturally significant because the designation not only "promote[s] peace and goodwill between nations, but also underscore[s] the international nature of wilderness and the co-operation required in its protection."⁶

² Convention Concerning the Protection of the World Cultural and Natural Heritage, art 11.4, *signed* Nov. 16, 1972, *entered into force* Dec. 17, 1975, 15 U.N.T.S. 511; *see also* UNESCO, Operational Guidelines for the Implementation of the World Heritage Convention, § III (Feb. 2005).

³ *See* <http://www.cr.nps.gov/worldheritage/glacier.htm>.

⁴ The western Cordillera describes the series of mountain ranges that comprise the Rocky Mountains in the United States and Canada and the Sierra Madre in Mexico.

⁵ United States and Canada, World Heritage List Nomination: Waterton Glacier International Peace Park, 44 (1994) [hereinafter Waterton-Glacier Nomination].

⁶ Parks Canada: Canada World Heritage Sites, http://www.pc.gc.ca/progs/spm-whs/itm2-/site11_E.asp. "It was the Rotary Clubs of Alberta and Montana that proposed, in 1931, uniting Waterton Lakes National Park in Alberta and Glacier National Park in Montana as the Waterton-Glacier International Peace Park, the first such park in the world." *Id.* The General Management Plan for Glacier National Park recognizes: "The two national parks, their international designations and recognition and the magnificent natural and heritage resources shared by the

The characteristics that led the Committee to designate Waterton-Glacier as a World Heritage site are being significantly and adversely affected by climate change. The glaciers are melting: the park's glaciers have been reduced from 150 to 27, and the remaining 27 glaciers are drastically retreating. This has altered water flows and water temperatures which have in turn affected Glacier's hydrological systems. This in turn has altered the distribution of temperature-sensitive organisms, such as members of the caddis fly family. Moreover, changes in air temperature are causing species to migrate, significantly changing the distribution of species within Waterton-Glacier.

For these and other reasons described at length in Section IV, petitioners respectfully request assistance from the Committee. Petitioners request that the World Heritage Committee list Waterton-Glacier on the List of World Heritage in Danger and, as described in Section V, establish a program of corrective actions to address these threats.

II. The Legal Framework: Authority for Present Petition

Article 11.4 of the World Heritage Convention directs the World Heritage Committee to establish and maintain a "List of World Heritage in Danger" "of which major operations are necessary and for which assistance has been requested under this Convention."⁷ The List of World Heritage in Danger may include only those sites that are "threatened by serious and specific dangers."⁸

The World Heritage Committee has identified two broad categories of the types of danger facing World Heritage sites that may warrant listing a site on the List of World Heritage in Danger: ascertained danger and potential danger. The Operational Guidelines for the Implementation of the World Heritage Convention define ascertained and potential dangers that might threaten natural properties as follows:

180. In the case of natural properties:

peace park region offer an opportunity for the two countries to promote and encourage environmental stewardship as these resources become more prized and attractive." U.S. Department of Interior and U.S. National Parks Service, General Management Plan Glacier National Park, 7 (1999).

⁷ World Heritage Convention, *supra* note 1, at art. 11.4. The full text of Article 11.4 reads:

The Committee shall establish, keep up to date and publish, whenever circumstances shall so require, under the title of "List of World Heritage in Danger," a list of the property appearing in the World Heritage List for the conservation of which major operations are necessary and for which assistance has been requested under this Convention. This list shall contain an estimate of the cost of such operations. The list may include only such property forming part of the cultural and natural heritage as is threatened by serious and specific dangers, such as the threat of disappearance caused by accelerated deterioration, large-scale public or private projects or rapid urban or tourist development projects; destruction caused by changes in the use or ownership of the land; major alterations due to unknown causes; abandonment for any reason whatsoever; the outbreak or the threat of an armed conflict; calamities and cataclysms; serious fires, earthquakes, landslides; volcanic eruptions; changes in water level, floods and tidal waves. The Committee may at any time, in case of urgent need, make a new entry in the List of World Heritage in Danger and publicize such entry immediately.

⁸ *Id.*

a) **ASCERTAINED DANGER** - The property is faced with specific and proven imminent danger, such as:

i) A serious decline in the population of the endangered species or the other species of outstanding universal value for which the property was legally established to protect, either by natural factors such as disease or by man-made factors such as poaching.

ii) Severe deterioration of the natural beauty or scientific value of the property, as by human settlement, construction of reservoirs which flood important parts of the property, industrial and agricultural development including use of pesticides and fertilizers, major public works, mining, pollution, logging, firewood collection, etc.

iii) Human encroachment on boundaries or in upstream areas which threaten the integrity of the property.

b) **POTENTIAL DANGER** - The property is faced with major threats which could have deleterious effects on its inherent characteristics. Such threats are, for example:

i) a modification of the legal protective status of the area;

ii) planned resettlement or development projects within the property or so situated that the impacts threaten the property;

iii) outbreak or threat of armed conflict;

iv) the management plan or management system is lacking or inadequate, or not fully implemented.⁹

In addition to finding ascertained or potential dangers, the World Heritage Committee must also consider whether the threats facing the site are amenable to correction by human action when determining whether to add a site to the “In Danger” list; it also may consider a list of supplemental factors:

181. In addition, the factor or factors which are threatening the integrity of the property must be those which are amenable to correction by human action. In the case of cultural properties, both natural factors and man-made factors may be threatening, while in the case of natural properties, most threats will be man-made and only very rarely a natural factor (such as an epidemic disease) will threaten the integrity of the property. In some cases, the factors threatening the integrity of

⁹ UNESCO, Operational Guidelines for the Implementation of the World Heritage Convention, §IV(B) ¶¶ 178, 180 (Feb. 2005) [hereinafter Operational Guidelines].

a property may be corrected by administrative or legislative action, such as the cancelling of a major public works project or the improvement of legal status.

182. The Committee may wish to bear in mind the following supplementary factors when considering the inclusion of a cultural or natural property in the List of World Heritage in Danger:

- a) Decisions which affect World Heritage properties are taken by Governments after balancing all factors. The advice of the World Heritage Committee can often be decisive if it can be given before the property becomes threatened.
- b) Particularly in the case of ascertained danger, the physical or cultural deteriorations to which a property has been subjected should be judged according to the intensity of its effects and analyzed case by case.
- c) Above all in the case of potential danger to a property, one should consider that:
 - i) the threat should be appraised according to the normal evolution of the social and economic framework in which the property is situated;
 - ii) it is often impossible to assess certain threats - such as the threat of armed conflict – as to their effect on cultural or natural properties;
 - iii) some threats are not imminent in nature, but can only be anticipated, such as demographic growth.
- d) Finally, in its appraisal the Committee should take into account any cause of unknown or unexpected origin which endangers a cultural or natural property.¹⁰

Taken together, Article 11.4 of the World Heritage Convention and these provisions of the Operational Guidelines include four elements for inscribing a property in the List of World Heritage in Danger:

- 1. It is a World Heritage Site;**
- 2. It is threatened by specific and serious dangers, whether ascertained or potential, that are amenable to correction by human action;**
- 3. Major operations are necessary for its conservation; and**
- 4. Assistance under the Convention has been requested for the property.**

As described in the following sections of this petition, Waterton-Glacier meets these four elements for inclusion in the List of World Heritage in Danger. Section III first provides general background on climate change and evidence that greenhouse gas emissions arising from human

¹⁰ *Id.* at §IV(B) ¶¶ 181–182.

activity are the leading cause of climate change. Section IV then identifies Waterton-Glacier International Peace Park as a World Heritage Site, describes the ascertained and potential dangers facing Waterton-Glacier, and addresses the four discretionary supplementary factors. Section V suggests major operations that are necessary to conserve the natural heritage of Waterton-Glacier as part of a program of corrective measures.

III. Global climate change is occurring because of human-induced emissions of gases that accumulate in the atmosphere causing the greenhouse effect.

In 1988, the United Nations Environment Programme and the World Meteorological Organization established the Intergovernmental Panel on Climate Change (IPCC) to assess the science and impacts of, and elaborate response strategies, to climate change. In 2001, the IPCC published its Third Assessment Report (TAR), assigning percentage confidence ranges to nearly all the key findings. Some of the key findings on temperature increases are set out below:

- The global average surface temperature (over land and sea) has increased over the 20th century by $.6^{\circ}\text{C}$, $\pm .2^{\circ}\text{C}$, with most warming occurring between 1910-1945 and 1976-2000.¹¹
- Most of the observed warming over the last fifty years is due to the increase in greenhouse gas concentrations (67%-90% confidence).¹²
- Globally, the 1990s were the warmest decade in the Northern Hemisphere on record (90-99% confidence).
- The temperature increase in the 20th century is the largest of any century in the last 1,000 years (67-90% confidence).¹³
- Warm episodes of the El Nino-Southern Oscillation (ENSO) phenomenon, which alters precipitation and temperature patterns over much of the tropics and sub-tropics, have occurred more persistently and more intensely since the mid-1970s than over the previous 100 years.¹⁴
- The global average surface temperature is projected to increase by 1.4 to 5.8°C from 1990-2100. This is much larger than the observed changes during the 20th century and is without precedent during at least the last 10,000 years (90-99% confidence).¹⁵

These findings indicate that the earth's climate system has demonstrably changed since the pre-industrial era.

¹¹ Intergovernmental Panel on Climate Change (IPCC), *Third Assessment Report (TAR): Climate Change 2001: The Scientific Basis*, §2.2.2.1 (2001) [hereinafter *The Scientific Basis*], available at http://www.grida.no/climate/ipcc_tar/wg1/052.htm#2221.

¹² *Id.* at Chapter 12 (Executive Summary), available at http://www.grida.no/climate/ipcc_tar/wg1/440.htm.

¹³ *Id.* at §2.3.5, available at http://www.grida.no/climate/ipcc_tar/wg1/071.htm#235.

¹⁴ *Id.* at Chapter 2 (Executive Summary), available at http://www.grida.no/climate/ipcc_tar/wg1/049.htm.

¹⁵ *Id.* at Chapter 9 (Executive Summary), available at http://www.grida.no/climate/ipcc_tar/wg1/339.htm.

The IPCC further indicates that “[t]here is new and stronger evidence that most of the observed warming over the last 50 years is attributable to human activities.”¹⁶ Humans contribute to climate change by discharging greenhouse gases, such as carbon dioxide, methane, and nitrous oxides, which trap radiation emitting from earth’s surface. As a result, the gases prevent the planet’s heat from escaping. Human activity has increased concentrations of greenhouse gases in the atmosphere throughout the 20th century.¹⁷

Of the gases that cause the “greenhouse effect,” human generated CO₂ emissions are the most problematic because of the massive quantities of CO₂ that humans emit.¹⁸ The IPCC reports that atmospheric levels of carbon dioxide have increased by thirty-one percent since the pre-industrial era and that atmospheric levels of methane, the second most problematic human generated greenhouse gas, have increased by 151 percent between 1750 and 1998.¹⁹ Additionally, the World Conservation Monitoring Center (WCMC) warns that atmospheric levels of CO₂ will double during this century if current emission trends continue.²⁰

The United Nations Framework Convention on Climate Change (UNFCCC) recognizes the human influence on climate change and even defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.”²¹ The UNFCCC further articulates the need for humans to take action against climate change by setting out the objective of the Convention as:

stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.²²

The scientific evidence and consensus confirm that climate change is occurring and that humans have the capacity to abate climate change and the adverse effects of climate change by reducing greenhouse gas emissions. The global community thus has the ability to slow or reverse the climate-change-induced damage to Waterton-Glacier’s resources of outstanding universal value.

¹⁶United Nations Framework Convention on Climate Change (UNFCCC) & United Nations Environment Programme, *Climate Change Information Kit, Climate Change Information Sheet*, 1, ¶ 2 (2002), available at <http://unfccc.int/resource/iuckit/cckit2001en.pdf>.

¹⁷ IPCC, *TAR: Climate Change 2001: Synthesis Report (Summary for Policymakers)*, Q2.4-5, available at <http://www.ipcc.ch/pub/un/syrenq/spm.pdf>.

¹⁸ World Conservation Monitoring Center (WCMC), Biodiversity and Climate Change Programme, Facts and Figures, (noting CO₂ emissions cause an estimated 70% of human-induced global warming), <http://www.wcmc.org.uk/climate/background.htm>.

¹⁹ *The Scientific Basis*, *supra* note 11, at §4.1.1, Table 4.1a (listing abundance in 1750 as 700 parts per trillion (ppt) and abundance in 1998 as 1745 ppt).

²⁰ WCMC, Biodiversity and Climate Change Programme, Human Influences on Climate, <http://www.wcmc.org.uk/climate/background.htm>.

²¹ United Nations Framework Convention on Climate Change, art. 1 §2, *signed* May 9, 1992, *entered into force* Mar. 21, 1994.

²² *Id.* at art. 2.

IV. Waterton-Glacier World Heritage Site meets the requirements and supplementary factors for inclusion on the List of World Heritage Sites in Danger.

A. Waterton-Glacier International Peace Park is on the World Heritage List.

The World Heritage Committee inscribed Glacier National Park in the United States and Waterton Lakes National Park in Alberta, Canada as one World Heritage Site in 1995.²³ Article 2 of the Convention describes the inscription criteria for natural heritage sites:

natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view;

geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation;

natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty.²⁴

The World Heritage Committee designated Waterton-Glacier International Peace Park as a World Heritage Site based on two of the more detailed criteria of the Operational Guidelines that interpret the Convention's criteria. First, the Committee found Waterton-Glacier to "contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance." Second, the Committee found the two parks to "be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals."²⁵ The World Heritage Committee identified six specific characteristics of Waterton-Glacier in deciding to include the park in the World Heritage List:

1. Waterton-Glacier exists at a climatological crossroads where Pacific weather systems mingle with warm air masses from the south and east and cold weather from the north.
2. Waterton-Glacier contains adjacent mountain and prairie ecosystems.
3. Waterton-Glacier has tremendous scenic and aesthetic value.
4. The status of Waterton-Glacier as the first International Peace Park is culturally significant because the designation not only "promote[s] peace and goodwill between

²³ World Heritage Committee, WHC-95/CONF.203/16, § VIII(A.1) (Jan. 31, 1995), *available at* <http://whc.unesco.org/archive/repcom95.htm#354>.

²⁴ Convention Concerning the Protection of the World Cultural and Natural Heritage, art. 2, *signed* Nov. 16, 1972, *entered into force* Dec. 17, 1975, 15 U.N.T.S. 511.

²⁵ Operational Guidelines, *supra* note 9, at § II(D)(vii, ix)(¶ 77). These criteria were formerly presented as two separate sets of criteria: criteria (i)-(vi) for cultural heritage and (i)-(iv) for natural heritage. The 6th extraordinary session of the World Heritage Committee decided to merge the ten criteria (Decision 6 EXT.COM 5.1). The criteria on which Waterton-Glacier World Heritage Site was listed are now vii (formerly natural heritage iii) and ix (formerly natural heritage ii).

- nations, but also underscore[s] the international nature of wilderness and the co-operation required in its protection.”²⁶
5. The waters of Waterton-Glacier flow into watersheds linked to the Pacific, Atlantic, and Arctic ocean systems.
 6. Waterton-Glacier is physiographically significant because it contains examples of Precambrian rock formations.²⁷

B. Waterton-Glacier World Heritage Site is threatened by serious and specific ascertained dangers that are amenable to correction by human action.

Climate change poses a serious and specific ascertained danger to the first four of these characteristics that resulted in the listing of Waterton-Glacier as a World Heritage Site. Indeed, the management authorities of Waterton Lakes National Park and Glacier National Park admit in their 2004 *Report on the State of Conservation of Waterton Glacier International Peace Park* for the World Heritage Committee that climate change is damaging aspects of the park that make it worthy of its World Heritage designation. The report states:

Climate change has and will continue to have important impacts to the International Peace Park [sic] natural resources. Scientific data collected in Glacier indicates that park glaciers have shrunk dramatically over the past century; that the park’s tree line is creeping higher in elevation; that the alpine tundra zone is shrinking, and that subalpine meadows are filling in with tree species. The ecological significance of losing the park’s glaciers is likely affecting stream baseflow in late summer and increasing water temperatures thus influencing the distribution and behavior of aquatic organisms and food webs.²⁸

As the management authorities of Waterton Lakes National Park and Glacier National Park indicate, climate change threatens the unique climate system of Waterton-Glacier, and, consequently, such change also threatens the park’s glaciers and hydrological features, as well as its ecosystem diversity, scenic beauty, and cultural significance—all outstanding universal values for which Waterton-Glacier was listed as a World Heritage Site.

1. Climate change is altering Waterton-Glacier World Heritage Site’s unique climate system.

Due to temperature increases and fluctuations in precipitation, climate change is already jeopardizing the complex climate of Waterton-Glacier’s “distinctive climate,” one of the

²⁶ Parks Canada: Canada World Heritage Sites, http://www.pc.gc.ca/progs/spm-whs/itm2-/site11_E.asp. “It was the Rotary Clubs of Alberta and Montana that proposed, in 1931, uniting Waterton Lakes National Park in Alberta and Glacier National Park in Montana as the Waterton-Glacier International Peace Park, the first such park in the world.” *Id.*

²⁷ WHC-95/CONF.203/16, *supra* note 23, at § VIII(A.1) (generally describing six characteristics).

²⁸ United States Department of the Interior and Parks Canada, Periodic Report on the Application of the World Heritage Convention, Report on the State of Conservation of Waterton-Glacier International Peace Park, § 5b (considered by the World Heritage Committee July 2005) [hereinafter State of Conservation Report], available at <http://www.nps.gov/oia/topics/Waterton-Glacier.pdf>.

principal reasons the World Heritage Committee designated the park as a World Heritage Site.²⁹ Waterton-Glacier's climate is especially distinctive because, southwest of the park, the Columbia Plateau creates a gap in the North American Cordillera that allows Pacific maritime weather systems to enter Waterton-Glacier and modify the park's climate.³⁰ The result is heavy precipitation and strong winds that, coupled with the park's complex topography and other weather influences from the north, south, and east, create a mosaic of microclimates in Waterton-Glacier that has led to the development of complex and unique ecosystems.³¹

However, in Waterton-Glacier, the climate is changing. Data from Glacier National Park indicate that the local summer mean temperature increased 1.66°C between 1910 and 1980.³² In addition, since 1900, precipitation levels in the region around Glacier National Park have decreased by as much as twenty percent.³³ These changes in Waterton-Glacier's climate drive other changes occurring in the park, such as glacial melt, changes in hydrological systems, and species migration, all of which, in turn, impact Waterton-Glacier's scenic beauty and cultural value.

2. Climate change is causing the rapid retreat of the glaciers in the Waterton-Glacier World Heritage Site.

Waterton-Glacier's receding glaciers provide tangible evidence that current climate-change patterns harm its natural features. Glacial retreat in Glacier National Park, where all of Waterton-Glacier's glaciers exist, is occurring particularly rapidly and is scientifically linked to climate change.

Compared to many of the world's glaciers, Glacier National Park's glaciers are small and therefore have responded relatively quickly to climate change.³⁴ Today there are only twenty-seven glaciers remaining in Glacier National Park,³⁵ less than one fifth of the approximately 150 glaciers that existed within the current park's boundaries in 1850.³⁶ Since 1850, the area covered by glaciers in the park decreased by seventy-three percent.³⁷ As U.S. Secretary of the Interior Bruce Babbitt observed in 1998, "[i]t's increasingly hard to understand why it's called Glacier National Park, because the glaciers are getting hard to find."³⁸ Indeed, projections indicate that if

²⁹ WHC-95/CONF.203/16, *supra* note 23, at § VIII(A.1).

³⁰ Waterton-Glacier Nomination, *supra* note 5, at 45.

³¹ *Id.* at 48.

³² Myrna H.P. Hall & Daniel B. Fagre, *Modeled Climate-Induced Glacier Change in Glacier National Park 1850-2100*, 53 BIOSCIENCE 131, 131 (2003) [hereinafter *Climate-Induced Glacier Change*].

³³ Environmental Protection Agency, Climate Change and Montana, EPA 230-F-97-008z, 2 (Sept. 1997) [hereinafter *Climate Change and Montana*], available at [http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BUTHT/\\$File/mt_impct.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BUTHT/$File/mt_impct.pdf).

³⁴ U.S. Geological Survey, Northern Rocky Mountain Science Center, Crown of the Continent Ecosystem, ¶ 5, available at <http://www.nrm-sc.usgs.gov/research/ecosystem.htm>.

³⁵ U.S. National Parks Service, Glacier National Park, Resources. Geology, Glaciers, available at <http://www.nps.gov/glac/resources/geology.htm>.

³⁶ U.S. National Park Service, Glacier National Park, Environmental Management Plan, 5 (Aug. 2004), available at <http://www2.nature.nps.gov/air/features/docs/GlacFinalEMS200408.pdf>.

³⁷ *Id.*

³⁸ Bruce Babbitt, U.S. Secretary of the Interior, October 7, 1998, *quoted at* U.S. Environmental Protection Agency, Global Warming—Impacts: Western Mountains website, available at

present warming rates continue, all of the park's glaciers will disappear by 2030.³⁹

Climate change is responsible for the disappearance of the park's glaciers. Climate change has led to global temperature increases, which have hastened glacial retreat at a pace unparalleled during past warming trends.⁴⁰ Glaciers are "excellent barometers of climate change, because they respond directly to trends in temperature, precipitation, and cloud cover."⁴¹ Scientists are able to trace the drastic glacial retreat in Glacier National Park to climate change both because few other anthropogenic forces exist locally that could influence climate patterns and because ample past data is available for comparison with current data. As Dr. Daniel Fagre, the Global Change Research Coordinator at the U.S. Geological Survey Research Center in Glacier National Park made clear, "Losing the glaciers in Glacier National Park is a supreme irony, one that should tell us that global warming is real."⁴²

The impact of climate change on glaciers has implications far beyond the boundaries of Glacier National Park, as ten percent of earth's land (15,000,000 square kilometers) is covered with ice,⁴³ and seventy-five percent of the earth's freshwater is stored in those glaciers.⁴⁴ WCMC and IPCC report that glacial retreat is widespread. Glacial retreat has altered fresh water flow quantities, rates, routes, and availability, while also contributing, along with icecap melt, between 0.2 and 0.4 millimeters per year to overall sea-levels during the last century.⁴⁵ Although this figure includes melting icecaps, scientists indicate that "[d]uring the 20th century, the areas and volumes for mountain glaciers decline much more than for the icecaps and contribute nearly all the [sea level rise]."⁴⁶ To put the amount of worldwide glacial melt in perspective: since the early 1960s, mountain glaciers have lost 4,000 cubic kilometers of water, which is more than one year's worth of discharge from the Orinoco, Congo, Yangtze, and Mississippi Rivers combined. Furthermore, in the 1990s, the rate at which glaciers melted more than doubled compared to the rates of previous decades.⁴⁷

Given the rapid glacial retreat in Glacier National Park and the advent of glacial retreat worldwide, the international community must recognize that climate change is responsible for the retreat of Glacier National Park's glaciers. Further, the baseline studies and ongoing scientific research, as well as the research facilities at Glacier National Park, will enable the

<http://yosemite.epa.gov/oar/globalwarming.nsf/content/ImpactsMountainsWesternMountains.html#changingeco>.

³⁹ *Climate-Induced Glacier Change*, *supra* note 32, at 137.

⁴⁰ See Andrew C. Revkin, *The Big Melt: A Cycle of Warming; No Escape: Thaw Gains Momentum*, N.Y. TIMES F1 (Oct. 25, 2005) (reporting that extracted cores of Arctic glaciers demonstrate that the warming of the last decade is different than past warm periods).

⁴¹ *Climate-Induced Glacier Change*, *supra* note 32, at 131.

⁴² Tom Yulsman, *Meltdown*, AUDUBON MAGAZINE (Dec. 2003), available at <http://magazine.audubon.org/truenature/truenature0312.html> (interview with Dr. Daniel Fagre).

⁴³ United Nations Environment Programme, GLACIERS AND THE ENVIRONMENT 3 (1992).

⁴⁴ *Id.* at 4.

⁴⁵ IPCC, *TAR: Climate Change 2001: The Scientific Basis (Full Report)*, § 11.3.2.2, Table 11.10, available at http://www.grida.no/climate/ipcc_tar/wg1/425.htm; see also UNEP, *supra* note 43, at 5 (indicating glacial melt is responsible for one third of sea level rise).

⁴⁶ Sarah C. Raper & Roger J. Braithwaite, *Low Sea Level Rise Projections from Mountain Glaciers and Icecaps Under Global Warming*, 439 NATURE 311, 312 (Jan. 2006).

⁴⁷ World Wildlife Fund, *Going, Going, Gone, Climate Change and Global Glacier Decline*, 2 (Sept. 7, 2005), available at www.panda.org/downloads/climate_change/glacierspaper.pdf.

global community to monitor its success in combating glacial retreat induced by climate change. The global community must take action to stop the glacial retreat in Waterton-Glacier both for the benefit of the park and for all natural heritage areas threatened by glacial retreat due to climate change.

3. Climate-change-induced glacial retreat is adversely affecting Waterton-Glacier's hydrological systems.

Glacial retreat is not only in and of itself an adverse impact of climate change, but it is also a signal of other less obvious climate change effects, such as alterations in the hydrological systems of Waterton-Glacier.⁴⁸ For example, glacial melt induced by climate change alters streamflows. The IPCC explains that a glacier in equilibrium releases the same amount of water through summer melt as it accumulates through winter precipitation; in contrast, a glacier in retreat releases more summer melt than it accumulates through winter precipitation.⁴⁹ Thus, flows initially increase in rivers and streams fed by spring and summer glacier melt due to global warming and increased melt. As a glacier shrinks, however, summer flows decline because of decreases in glacial melt. The period of increased flows varies with glacier size and the rate of melt. Smaller glaciers like those in Waterton-Glacier have a shorter period of increased flows. Thus, summer flows in Waterton-Glacier will decline more quickly, because of its small glaciers.

Snow and snowmelt, including glacial melt, influence many hydrological and ecosystem processes in Waterton-Glacier. Seventy percent of annual precipitation in the park falls as snow at high elevations,⁵⁰ feeding the snowpack and glaciers that, in turn, melt into Waterton-Glacier's many streams and rivers that flow into three separate drainage systems, each of which empties into a different ocean. The World Heritage Committee designated Waterton-Glacier International Peace Park as a World Heritage Site, in part, because of this tri-ocean hydrological divide.

However, the stability and unique drainage features of Waterton-Glacier World Heritage Site are at risk because of a "trend toward later maximum snowpack accumulation . . . [and] earlier snowmelt, potentially creating more intense spring run-off and flooding."⁵¹ U.S. Geological Survey scientists have recently reestablished a stream flow monitoring station specifically to help measure the effects of glacial recession at the creek flowing out of one of

⁴⁸ "[T]he most significant aspect of glacial retreat may be that it is tangible and intuitive evidence of broader environmental changes that are more difficult to measure." *Climate-Induced Glacier Change*, *supra* note 32, at 131.

⁴⁹ *IPCC, TAR: Climate Change 2001: Impacts, Adaptation and Vulnerability*, § 4.3.11, available at http://www.grida.no/climate/ipcc_tar/wg2/174.htm#4311.

⁵⁰ Daniel J. Selkowitz, et al., *Interannual Variations in Snowpack in the Crown of the Continent Ecosystem*, 16 *HYDROLOGICAL PROCESSES* 3,651, 3,653 (2002). The waters in the park flow ultimately to either the Pacific Ocean, the Arctic Ocean, or the Atlantic Ocean.

⁵¹ Daniel B. Fagre, *Glacier National Park Biosphere Reserve: Its Suitability for the Mountain Research Initiative*, 5–6 (prepared for Global Change Research in Mountain Biosphere Reserves Launching workshop held in Entibuch Biosphere Reserve Nov. 10-13, 2003), available at www.unesco.org/mab/mountains/Fagre_org.doc_Supplemental_Result.

Glacier National Park's better known glaciers, Grinnell Glacier.⁵²

Increased snow and glacial melt also causes fluctuations in water temperatures that destabilize aquatic ecosystems. Studies conducted in McDonald Basin in Glacier National Park indicate that several species of the temperature-sensitive caddis fly family, *Hydropsycidae*, have increasingly shifted out of their previously well-defined distribution areas, thus demonstrating that stream temperatures have begun to increase.⁵³ Furthermore, the U.S. Geological Survey designed a computer-modeling program that has predicted, based on the slight temperature increase that has occurred thus far, even more significant changes in Glacier National Park's natural water cycles. As the National Park Conservation Association's *Waterton Glacier International Peace Park Resource Assessment* warns: "The greatest future threat to the park's aquatic resources may arise from alterations associated with global climate change."⁵⁴ Although the climate-change effects on the hydrological systems of Waterton-Glacier are not as obvious as the impacts on the glaciers themselves, changes are occurring and will only accelerate with continued global climate change. As the caddis fly demonstrates, climate change is also triggering species redistribution.

4. Climate Change is disturbing the balance of Waterton-Glacier's ecosystem.

Climate change presently harms—and will continue to harm—the remarkably rich species diversity of Waterton-Glacier by driving species out of their historical geographical ranges and even eliminating some species from the park entirely. Species diversity in Waterton-Glacier is especially vulnerable to climate change because many of the park's species depend on the particular climatic balance in the park and cannot adapt to even minor changes in climate. Consequently, populations of these species will not successfully make range adjustments and will, instead, fragment and perish.⁵⁵

Waterton-Glacier currently boasts vast biological diversity. The World Conservation Union (IUCN), in its evaluation advocating the listing of Waterton-Glacier International Peace Park as a World Heritage Site, emphasized that even though Waterton-Glacier is only one-fifth the size of the Canadian Rockies World Heritage Site, it has an equivalent number of vascular plant species.⁵⁶ Two major continental biomes and five major floristic provinces converge

⁵² See U.S. Geological Survey, Real-Time Data for Montana: Streamflow (showing real-time data for streamflow near Grinnell Glacier), *available at* http://waterdata.usgs.gov/mt/nwis/uv/?site_no=05013900&PARAMeter_cd=00060,00065,00010.

⁵³ Daniel B. Fagre, et al, *Watershed Responses to Climate Change at Glacier National Park*, 33 JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION 755, 764 (Aug. 1997).

⁵⁴ National Parks Conservation Association, *Waterton Glacier International Peace Park, State of the Parks Resource Assessment*, 15 (Nov. 2002) *available at* http://www.npca.org/across_the_nation/park_pulse/glacier/glacier.pdf.

⁵⁵ In Glacier National Park, "many species exist at the limits of their biogeographic ranges. Some of these sensitive species will directly respond to minor climatological changes; others will respond to climate-induced habitat changes. The effects will be evident ... in range shifts detected first as local extinctions, and ultimately as invasions by new species." U.S. Geological Survey, Northern Rocky Mountain Science Center, *Crown of the Continent Ecosystem*, ¶ 7, *available at* <http://www.nrmssc.usgs.gov/research/ecosystem.htm>.

⁵⁶ IUCN, *Glacier and Waterton Lakes National Park Technical Evaluation*, World Heritage Nomination, §2, ¶ 10 (Nov. 1995) (based on the 1993 and 1994 nominations submitted by the Government of the U.S.A. and Canada). "Five large ecoregions are found within the Waterton Glacier complex: Alpine Tundra, Subalpine Forest,

within Glacier National Park's boundaries.⁵⁷ Of the more than 1,400 plant species in Glacier National Park, twenty-eight do not grow anywhere else in the state of Montana.⁵⁸

The IUCN indicates that “any global warming will have major impact on mountain flora and fauna” and explains that increasing temperatures force species already confined to narrow vegetation zones at high altitudes to migrate to more compact and higher elevation areas.⁵⁹ The loss of mountain-dwelling plant species poses a serious concern since mountain ecosystems are both home to extensive biodiversity and highly vulnerable to adverse impacts of human activities. In fact, mountain ecosystems contain half of the world's twenty-four designated biodiversity “hot spots,” areas that are particularly rich in endemic plant species diversity but are also seriously threatened with plant habitat loss.⁶⁰ As a pristine mountain protected area, Waterton-Glacier is highly sensitive to species loss caused by climate change.

Climate change jeopardizes Waterton-Glacier's species diversity because it forces species to adjust their geographical range, which may force many species outside the protective boundaries of the park.⁶¹ An increase in global temperatures of one degree Celsius causes a shift in temperature zones of approximately 160 kilometers (100 miles). A temperature increase of three degrees Celsius will thus drive Waterton-Glacier's plant and animal species as many as 500 kilometers (300 miles) north or 500 meters (1600 feet) upwards in elevation.⁶²

Plant species are already on the move in Glacier National Park. Repeat photography in the park visually documents changes in the alpine areas, and digital aerial photography has documented the expansion in area, and increase in biomass, of the alpine treeline area.⁶³ As one researcher reports, “[a]lpine treelines are moving upward and increasing in biomass.”⁶⁴ With

Montane Forest, Aspen Parkland, and Fescue Grassland. A number of vegetation types have been identified for this area which are undescribed elsewhere: these include extensive Fir Whitebark forests, large areas of Limber Pine scrub, and ‘intermediate’ alpine meadow associations. In all, some 1258 vascular plant species and 275 lichens have been identified from Glacier, including 18 which are found only in the park and its immediate environs. Six vascular plant species found in Waterton Lakes are classified as rare in Canada. Sixty mammal species have been recorded for the two parks, including a population of over 200 grizzly bear and more than twice as many black bear.” IUCN & WCMC, *World Heritage Nomination: Glacier and Waterton Lakes National Parks (USA – Canada)*, §3, ¶ 2 (Nov. 1995).

⁵⁷ “Given the physical diversity of Glacier National Park, it is not surprising that tremendous biological diversity exists there as well. Glacier encompasses an interface of 2 major continental biomes and 5 major floristic provinces, ranging from the mesic boreal forest and alpine tundra to semi-arid grassland. Numerous plant communities and over 1,000 plant species, reflect the unique convergence of these provinces. The faunal diversity reflects that of the floral diversity.” U.S. Geological Survey, Northern Rocky Mountain Science Center, Crown of the Continent Ecosystem ¶ 7, *available at* <http://www.nrm-sc.usgs.gov/research/ecosystem.htm>.

⁵⁸ EPA, Climate Change and Montana, *supra* note 33, at 4.

⁵⁹ IUCN, World Commission on Protected Areas Mountains, Key Issues ¶ 5, *available at* <http://www.iucn.org/themes/wcpa/biome/mountain/issue.htm>.

⁶⁰ *Id.* at ¶ 2. Hotspots by definition contain at least 1,500 species of vascular endemic plants that have lost a minimum of 70% of their original habitat. Conservation International, Hotspots Defined, ¶ 2, http://www.biodiversityhotspots.org/xp/Hotspots/hotspotsScience/hotspots_defined.xml.

⁶¹ See e.g., “Six rare alpine plant species that are at the southern border of their geographic range would be especially vulnerable to climate change.” EPA, Climate Change and Montana, *supra* note 33, at 4.

⁶² Karen J. Schmidt, *Glacier National Park Biodiversity Paper #7*, at ¶ 13, *available at* <http://www.nps.gov/glac/resources/bio7.htm>.

⁶³ Fagre, *supra* note 51, at 7.

⁶⁴ Selkowitz, et al., *supra* note 50, at 3,651.

increasing temperatures, species may quickly move outside the protective limits of the relatively small Waterton-Glacier World Heritage Site protected area. The IUCN evaluation of Waterton-Glacier submitted to UNESCO to advocate for the listing of the park as a World Heritage Site acknowledged this issue, stating: “One expert reviewer has compared the data on fauna and concluded that the main concern was the ecological integrity and population viability of [Waterton-Glacier World Heritage Site] the size of which is a limiting factor.”⁶⁵ Waterton-Glacier’s small size makes the park proportionately rich in plant species but also especially vulnerable to species loss.

Additionally, because many of the species in Waterton-Glacier lack the ability to adapt, climate change will likely cause regional extinctions.⁶⁶ Factors such as small population size, small range, and whether a species already lives at the limit of its range weigh heavily against a species’ capacity to successfully redistribute itself.⁶⁷ These limiting factors are common among the species of Waterton-Glacier because so many of its species rely on the particular ecosystem balance in the park for their survival. As the 1994 nomination of Waterton-Glacier International Peace Park summarized, “The presence of disjunct and endemic species in a site of environmental complexity and geographic discontinuity renders Waterton Glacier International Peace Park highly significant as a centre of genetic diversity and ecological community development, especially in the context of global climate change.”⁶⁸ Climate change thus results in cascading negative effects on the park’s many prized features, beginning with increasing temperatures and melting glaciers that make stream flows and temperatures volatile, driving species out of their ranges. These cascading effects of climate change combine to detract from the scenic and cultural value of the park.

5. Climate change is reducing the scenic appeal and cultural value of Waterton-Glacier.

The degradation of the park’s resources injures the status of Waterton-Glacier World Heritage Site as a culturally significant International Peace Park that symbolizes the universally recognized importance of natural resources. Canada and the United States combined Glacier and Waterton to form the world’s first international peace park because “[e]cological values and processes are independent of legal and political boundaries.”⁶⁹ Waterton-Glacier World Heritage Site is thus a symbol of the culturally significant concept that ecological values transcend political boundaries. The global community should therefore safeguard the park’s resources both to adhere to the principle that ecological values transcend borders and to protect the particular cultural significance of Waterton-Glacier World Heritage Site. The principle that the world shares certain ecological values is hollow unless the global community—and regarding Waterton-Glacier, particularly the United States and Canada—act to preserve the Waterton-Glacier World Heritage Site and its natural resources of outstanding universal value.

⁶⁵ IUCN and WCMC, World Heritage Nomination: Glacier and Waterton Lakes National Park Technical Evaluation, §2, ¶ 7 (Nov. 1995) (based on the 1993 and 1994 nominations submitted by the Government of the U.S.A. and Canada) [hereinafter Technical Evaluation].

⁶⁶ *Id.*

⁶⁷ Schmidt, *supra* note 62, at ¶ 13.

⁶⁸ Waterton-Glacier Nomination, *supra* note 5, at 50.

⁶⁹ Technical Evaluation, *supra* note 65, at § 3 ¶7.

Glacier National Park and Waterton Lakes National Park both received national park designations due to “their superlative mountain scenery, their high topographic relief, glacial landforms, pristine lakes, and an abundant diversity of wildlife and wildflowers.”⁷⁰ Waterton-Glacier World Heritage Site’s scenic appeal wanes as the landscape becomes more homogenous, with snowcapped mountains and plant diversity diminishing and glaciers, lakes, and streams shrinking.

The most rapidly occurring and significant climate-change-induced effect on the park’s scenic value is the unceasing retreat of the park’s glaciers. Glacier National Park has lost seventy-three percent of its glacial coverage.⁷¹ In announcing the need to protect mountain areas, IUCN reiterated that Glacier National Park “will be without its icefields by 2030.”⁷² The vanishing glaciers similarly prompted former vice-president of the United States Al Gore to comment at the U.N. World Environment Day conference in June 2005 that within twenty years Glacier National Park will be the park “formerly known as Glacier.”⁷³

As world-wide concern demonstrates, the scenic quality of Waterton-Glacier World Heritage Site deteriorates as the glaciers that are the namesake of Glacier National Park rapidly disappear. The loss of Waterton-Glacier World Heritage Site’s resources constitutes a global problem that may be corrected if the global community takes action. As the management authorities of Waterton-Glacier World Heritage Site submitted to the World Heritage Committee: “While managers of the International Peace Park are not in a position to affect global climate change through their management actions, the extensive monitoring occurring within Glacier National Park will help clarify the impacts of climate change on the park and thus help prompt action by State Parties to slow or reverse this global problem.”⁷⁴ The global community and particularly the State parties that act as stewards of the Waterton-Glacier World Heritage Site—the United States and Canada—must act to slow or reverse global climate change. The World Heritage Committee can take the first step by recognizing Waterton-Glacier as “In Danger” due to climate change.

C. Waterton-Glacier faces potential danger due to inadequate management.

In addition to the ascertained dangers described above, Waterton-Glacier also faces potential dangers due to inadequate management that warrant the park’s listing on the List of World Heritage in Danger. The Operational Guidelines state that potential danger exists when a natural World Heritage site faces “major threats which could have deleterious effects on its inherent characteristics.”⁷⁵ Examples of these threats include management plans or systems that are “lacking or inadequate, or not fully implemented.”⁷⁶ The Operational Guidelines also state

⁷⁰ *Id.* at 51.

⁷¹ See *supra* note 37 and accompanying text.

⁷² IUCN, Protect Mountains—Save the World’s Water Towers Mountain Protected Areas, *available at* <http://www.iucn.org/congress/documents/press/2004-11-18-mountains.htm>.

⁷³ Cecilia M. Vega, *Warning from Gore on Future Global Warming Called an Emergency*, SAN FRANCISCO CHRONICLE, June 5, 2005, at A17, *available at* <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2005/06/05/GORE.TMP>.

⁷⁴ State of Conservation Report, *supra* note 28, at §5b.

⁷⁵ Operational Guidelines, *supra* note 9, at §IV(B)(180)(b).

⁷⁶ *Id.* at §IV(B)(180)(b)(iv).

that management of World Heritage sites “should ensure that the outstanding universal value . . . at the time of inscription [is] maintained or enhanced in the future.”⁷⁷ Management systems that do not ensure that outstanding universal values are maintained are inadequate and pose a potential danger to the World Heritage sites they govern.

While numerous management plans cover Waterton-Glacier World Heritage Site, none adequately address the dangers of climate change. Moreover, an integrated management plan does not exist for Waterton-Glacier.⁷⁸ Instead, Parks Canada manages Waterton Lakes National Park and the U.S. National Park Service separately manages Glacier National Park. United States law obligates national park managers to create management plans that govern operations in national parks. The Operational Guidelines state that regulatory and legislative measures at local and national levels should protect the property against change that could have negative impacts on its outstanding universal value or integrity.⁷⁹ Climate change is causing negative impacts, including the loss of glaciers and changes in the park’s climate, hydrology and ecosystems. Though the park managers recognize the need to manage for threats occurring because of climate change, they are incapable of adequately addressing these ascertained dangers because the causes of these threats—high rates of greenhouse gas emissions—occur nearly entirely outside the park’s boundaries. Nonetheless, proper management of climate change by the United States, which emits about twenty-five percent of global greenhouse gas emissions, could significantly protect Waterton-Glacier’s World Heritage values. Yet, the United States has yet to undertake meaningful steps to reduce its emissions of greenhouse gases. For this reason, park management is currently inadequate but remains amenable to corrective actions.

1. Site-specific management plans are inadequate to address global threats like climate change.

Despite twenty years of U.S. government reports documenting the dangers facing Glacier National Park,⁸⁰ the National Park Service (NPS) has failed to adequately address the threats attributable to climate change.⁸¹ A 1993 report stated that to adequately manage for environmental concerns, NPS needs the capacity to respond to “climate change caused by increased greenhouse gas concentrations in the atmosphere.”⁸² The NPS, however, does not have this capacity because its authority is largely limited to the confines of national parks. Thus,

⁷⁷ *Id.* at §II(F)(96).

⁷⁸ State of Conservation Report, *supra* note 28, at 7.

⁷⁹ Operational Guidelines, *supra* note 9, at §II(F)(98).

⁸⁰ In 1980, NPS produced the *State of the Parks* report, which was the first review of threats facing the entire park system. The report indicated that Glacier was among the most threatened of the national parks. Office of Science and Technology, *National Park Service, U.S. Dept. of Interior, State of the Parks – 1980: A Report to the Congress*, App. III (May 1980).

⁸¹ The National Park Service, which administers all properties within the United States designated as national parks, is charged with managing and preserving the parks for the enjoyment of future generations. 16 U.S.C. §1 (2000). Congress designated Glacier National Park in 1910. 16 U.S.C. §161 (2000).

⁸² *The Vail Agenda* noted that “[e]cologically sound management requires active management and a vision which looks beyond artificial boundaries at environmental concerns, whether they originate locally, regionally, nationally, or internationally. [NPS] must have the capacity to respond to threats, whether they come from a dam at the park boundary, air pollution from a facility 100 miles away, or climate change caused by increased greenhouse gas concentrations in the atmosphere.” William J. Briggles, et al., *National Parks for the 21st Century: The Vail Agenda*, 106 (1993) [hereinafter *The Vail Agenda*].

any management it undertakes within the park boundaries, though laudable, is inadequate to address the looming consequences of climate change in Waterton-Glacier.⁸³

Because Glacier National Park's managers recognize that the park is "experiencing major impacts from a warming climate right now,"⁸⁴ they have taken steps to reduce greenhouse gas emissions within Glacier. These efforts include using alternative fuel buses as shuttles for employees and increasing energy efficiency in park buildings.⁸⁵ The Environmental Management Plan also calls for increasing the availability of shuttles for visitors to Glacier in an effort to reduce the number of visitors' vehicles traveling through the park.⁸⁶

However, localized efforts alone cannot adequately address the dangers facing Waterton-Glacier. Any plan to effectively reduce the rate of glacial loss must involve efforts that go well beyond the confines of the park. In 2004, greenhouse gas emissions within Glacier National Park were only a minute fraction of U.S. emissions. A report prepared for the NPS in 2004 stated that Glacier's greenhouse gas emissions were 7,298.5 metric tons of carbon equivalents.⁸⁷ According to a report issued by the U.S. Environmental Protection Agency (EPA), net greenhouse gas emissions for the entire United States in 2003 totaled 6,072.2 teragrams of carbon dioxide equivalent.⁸⁸ By comparison, the emissions from within Glacier National Park are approximately 0.027 teragrams of carbon dioxide equivalent or about four millionths of one percent of the total U.S. greenhouse gas emissions in 2003.⁸⁹ Reducing GHG emissions within Glacier National Park, or even more generally the Waterton-Glacier World Heritage Site, will never have a substantial effect on the dangers posed to the park by climate change because even if the site was successfully managed under a zero emissions policy, it would not sufficiently reduce those dangers. Because the emissions within Glacier National Park account for a tiny fraction of all U.S. emissions, the United States must develop an adequate national plan to protect this World Heritage Site from the dangers posed by climate change.

2. Current management at the national level is also inadequate.

Current U.S. efforts to curb GHG emissions are not sufficient to protect the Waterton-Glacier World Heritage Site from the dangers of climate change. However, national reduction efforts could have measurable impacts on global emissions. The United States is the largest emitter of greenhouse gases; it accounts for nearly twenty-five percent of global greenhouse gas

⁸³ "[T]he mountain glaciers that gave Glacier National Park its name are predicted to disappear within 30 years." National Park Service, *Glacier National Park Environmental Management Plan*, 4 (2004), available at <http://www2.nature.nps.gov/air/features/docs/GlacFinalEMS200408.pdf>.

⁸⁴ *Id.* at 5.

⁸⁵ *Id.* at 8–10.

⁸⁶ *Id.* at 8–9.

⁸⁷ National Park Service, *Greenhouse Gas Emissions Inventory, Glacier National Park*, 3 (April 19, 2004), available at <http://www2.nature.nps.gov/air/features/docs/GlacFinalGHGInventory.pdf>.

⁸⁸ Environmental Protection Agency, *In Brief: The U.S. Greenhouse Gas Inventory*, 7 (2005) [hereinafter *U.S. Inventory*], available at [http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/RAMR5CZKVE/\\$File/ghgbrochure.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/RAMR5CZKVE/$File/ghgbrochure.pdf).

⁸⁹ One teragram of carbon dioxide equivalent is equal to one million metric tons of carbon equivalent multiplied by forty-four twelfths (44/12). *Id.* at 8. (Note that the Glacier GHG inventory is measured in metric tons, not millions of metric tons.)

emissions.⁹⁰ EPA reports that nationwide emissions increased in all but one year between 1995 (when Waterton-Glacier was added to the List of World Heritage) and 2003.⁹¹ In addition, NPS has recognized that alleviating the threats of climate change requires national and even international cooperation. Despite these facts, the United States has failed to ratify the Kyoto Protocol and has taken few, if any, steps to adopt a meaningful plan to reduce CO₂ and other greenhouse gas emissions. The United States' failure to reduce, or even seriously commit to reducing greenhouse emissions, represents inadequate national management.

The United States has failed to allow the regulation of carbon dioxide under the Clean Air Act (CAA) and is actively fighting the states in their legal efforts to regulate carbon dioxide. In 2003, EPA's General Counsel stated that greenhouse gases, including carbon dioxide, are not air pollutants and are not subject to regulation under the CAA.⁹² Additionally, the U.S. federal government has resisted the states' efforts to seek judicial review of the EPA's decision not to regulate greenhouse gases.⁹³ This reluctance to regulate greenhouse gases is antithetical to managing for the reduction of greenhouse gas emissions.

Further, the United States is not aggressively pursuing alternative energy sources. While the United States allotted \$5.09 billion in federal funding to climate change in 2004, only \$352 million (approximately seven percent) of this was earmarked for renewable energy.⁹⁴ The energy plan released by the Bush administration in 2001 calls for continued reliance on coal, oil, and nuclear technologies while doing little to promote renewable energy.⁹⁵ Continued reliance on fossil fuels will result in continued increases in greenhouse gas emissions and exacerbate the effects of climate change.

If the United States managed for significant reductions of national GHG emissions, such action would not only measurably reduce global emissions but would also significantly strengthen the international efforts to slow the effects of climate change. The United States has not managed for reductions in GHG emissions and therefore has not ensured that the outstanding universal values of Waterton-Glacier will be maintained in the future.

The management plan in place locally for Glacier National Park is inadequate because it lacks authority over the sources of greenhouse gas emissions that threaten the park.⁹⁶ National

⁹⁰ Earth Policy Institute, Eco-Economy Indicators, *available at* http://www.earth-policy.org/Indicators/CO2/CO2_data.htm#fig4.

⁹¹ *U.S. Inventory*, *supra* note 88, at 7 (2005).

⁹² Memorandum from Robert E. Fabricant, EPA General Counsel, to Marianne L. Horinko, EPA Acting Administrator 10 (Aug. 28, 2003), *available at* <http://www.epa.gov/airlinks/co2petitiongcmemo8-28.pdf>.

⁹³ *See* Commonwealth of Massachusetts, et al. v. Environmental Protection Agency, 415 F.3d 50 (D.C. Cir. 2005) (Twelve states, New York City, American Samoa, and the District of Columbia sued the EPA seeking regulation of CO₂ and other greenhouse gases).

⁹⁴ Government Accountability Office, *Climate Change, Federal Reports On Climate Change Funding Should Be Clearer and More Complete* 3 (August 2005), *available at* <http://www.gao.gov/new.items/d05461.pdf>.

⁹⁵ Booth Gunter, *Bush-Cheney Energy Plan: Plunder, Pollute, Price-Gouge and Profiteer*, Common Dreams Progressive Newswire (May 17, 2001), *available at* <http://www.commondreams.org/news2001/0517-08.htm>.

⁹⁶ Recognizing that NPS generally lacked the authority to protect the National Parks from climate change and other transboundary threats, *The Vail Agenda* noted that many of its recommendations for resource stewardship and protection would "require legislative action by Congress." *The Vail Agenda*, *supra* note 82, at 34.

efforts that would protect Waterton-Glacier from damage caused by climate change are lacking or not fully implemented as evidenced by continued increases in GHG emissions. The combination of these inadequate efforts poses a potential danger to the outstanding universal value of Waterton-Glacier World Heritage Site. Climate change is the chief cause of glacial loss in the park.⁹⁷ The continued failure to adequately address the effects of climate change on Waterton-Glacier will lead to further damage to the park's outstanding universal values through glacial loss and other ensuing effects, such as hydrological shifts and species migrations.

D. Supplemental Factors

1. The decision of the World Heritage Committee can often be decisive if it can be given before the property becomes threatened.

Unfortunately, Waterton-Glacier is already threatened with serious and specific ascertained dangers. However, the park is also threatened with potential danger—if the park continues to be inadequately managed, the ascertained dangers already identified will worsen and more will ensue. The World Heritage Committee's advice could motivate the United States and Canada to actively manage and ameliorate the dangers to Waterton-Glacier caused by climate change.

2. In the case of ascertained dangers, deteriorations should be judged by the intensity of their effects and analyzed on a case-by-case basis.

The ascertained danger of climate change and its implications for Waterton-Glacier, including deleterious effects on the park's climate, its glaciers, its hydrology, and its species, as well as its scenic and cultural values, is the most intense threat facing the outstanding universal values of the Waterton-Glacier World Heritage Site. With decisive action, however, some, if not all, of Waterton-Glacier's values can be preserved for future generations.

3. The World Heritage Committee should consider certain factors for appraising potential dangers.

The Operational Guidelines suggest that in the case of potential danger, the World Heritage Committee should consider the threats within normal evolutions of social and economic frameworks, note the impossibility of ascertaining certain threats, such as armed conflict, and realize that some threats are not imminent. None of these factors apply. The threat of climate change to the outstanding universal values of Waterton-Glacier is well-documented: the park's glaciers are melting rapidly and scientific authorities within the park have been assessing and monitoring the threats to the park caused by climate change. These threats are imminent in nature and have had a real effect on the park.

4. The Committee should take into account any cause of unknown or unexpected origin.

⁹⁷ Carl H. Key, et al., *Glacier Retreat in Glacier National Park, Montana*, in *Glaciers of the Coterminous United States*, U.S. Geological Survey Professional Paper J375 (Richard S. Williams & Jane G. Ferrigno eds., 1999).

The cause of the dangers in the Waterton-Glacier World Heritage Site is known: climate change. The only unknown is the speed and extent of further deterioration due to climate change.

V. Major Operations are Necessary for Waterton-Glacier's Conservation.

Climate change is a global concern, causing deterioration to World Heritage Sites worldwide. Consequently, all State parties to the World Heritage Convention are affected by climate change and a program of corrective actions must call upon State parties to reduce greenhouse gas emissions. The preamble of the Convention makes this clear, stating that it is incumbent on the international community as a whole to participate in the protection of heritage of universal value. Further, Article 6, para. 1 states that State parties "recognize that such heritage constitutes a world heritage for whose protection it is the duty of the international community as a whole to cooperate." This suggests that all State parties have an obligation to protect the outstanding universal values of Waterton-Glacier World Heritage Site that are currently threatened by climate change. Finally, Article 6, para. 3 provides that "[e]ach State Party . . . undertakes not to take any deliberate measures which might damage directly or indirectly the cultural and natural heritage . . . situated on the territory of other States Parties." The World Heritage Convention calls upon all Parties, to address the climate change threats facing Waterton-Glacier, and all other similarly threatened World Heritage Sites.

In addition to protecting natural and cultural heritage worldwide, Parties also have a special responsibility to protect and conserve world heritage within their territories. Article 4 of the World Heritage Convention makes this clear:

Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation, and transmission to future generations of the cultural and natural heritage . . . situated on its territory, belongs primarily to that State. [The State] will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain.

Thus, the United States and Canada must take action to protect and conserve the world heritage of Waterton-Glacier. Recognizing that the United States is home to the glaciers in Waterton-Glacier and that it is the leading emitter of greenhouse gases, Petitioners submit that a program of corrective measures should primarily focus on limits in U.S. greenhouse gas emissions.⁹⁸ The Kyoto Protocol sets greenhouse gas reduction targets with the aim of preventing dangerous anthropogenic interference with the climate system. Thus, these targets should be initial guidelines for a program of corrective measures addressing the causes of climate change.

⁹⁸ In 2000, the United States contributed 6.928 million tons of carbon dioxide equivalent (MtCO₂), amounting to 20.6% of total world greenhouse gas emissions. Canada, on the other hand, contributed 680 MtCO₂, amounting to 2% of total world greenhouse gas emissions. Kevin A. Baumert, et al., *Navigating the Numbers: Greenhouse Gas Data and International Climate Policy*, 12 (World Resources Institute 2005).

Under the Kyoto Protocol, the United States, if a Party, would be required to reduce greenhouse gas emissions to seven percent lower than 1990 emissions by the year 2012, with demonstrable progress to be shown by 2005. The United States is not on target to meet this goal. Indeed, U.S. emissions increased two percent in 2004 and 15.8 percent over 1990 levels.⁹⁹ Nonetheless, the following suggested course of corrective actions would significantly reduce U.S. greenhouse gas emissions and thereby fulfill the duty to protect and conserve the world heritage situated in its territory.

In 2002, carbon dioxide accounted for eighty-three percent of all U.S. greenhouse gas emissions, when all emissions are weighted on a carbon equivalent basis.¹⁰⁰ Of these carbon dioxide emissions, ninety-seven percent were generated by the combustion of fossil fuels.¹⁰¹ The majority of carbon dioxide emissions generated by the combustion of fossil fuels occurs primarily from coal-burning electricity generation and petroleum consumption within the transportation sector. As such, the following sections briefly summarize measures the United States could take to reduce these carbon dioxide emissions. For both electricity generation and transportation, this could mean either substituting renewable energy sources or regulating carbon dioxide emissions under existing and/or proposed U.S. laws. In addition, a program of corrective measures could include continued efforts to increase energy efficiency in the United States.

A. Electricity generation

The United States Environmental Protection Agency (EPA) reports that electricity generation is the single largest contributor to carbon dioxide emissions in the United States, accounting for thirty-nine percent of all carbon dioxide emissions.¹⁰² Thus, any program of corrective measures should consider both reducing reliance on coal to produce electricity (because coal-burning is an extremely carbon-intensive energy source) and regulating carbon emissions to the extent that coal-burning continues to be used for electricity generation.

Increased reliance on renewable energy sources could greatly reduce the amount of electricity generated from coal-burning, which could tremendously reduce the United States' total carbon dioxide emissions. The Union of Concerned Scientists (UCS) suggests that increasing electricity from renewable energy sources, including the use of wind, biomass, and geothermal and solar production, to even just twenty percent of all electricity generation by 2020, along with other renewable energy incentives, could lead to reductions in carbon dioxide emissions from power plants equal to two-thirds of emissions resulting from a business-as-usual scenario.¹⁰³ This type of increased reliance on alternative energy sources is similar to legislation

⁹⁹ Dep't of Energy, Energy Information Administration, *Emissions of Greenhouse Gas in the United States 2004*, xi (Dec. 2005).

¹⁰⁰ Bureau of Transportation Statistics, Greenhouse Gas Emissions, *available at* http://www.bts.gov/publications/transportation_statistics_annual_report/2004/html/chapter_02/greenhouse_gas_emissions.html (citing EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2002* (Apr. 2004)).

¹⁰¹ *Id.*

¹⁰² EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2003*, 60 (Apr. 2005).

¹⁰³ Union of Concerned Scientists, *Clean Energy Blueprint: A Smarter National Energy Policy for Today and the Future*, 4, 20 (Oct. 2001).

proposed in the United States, suggesting that these types of changes are both politically palatable to many Americans, technologically feasible, and economically wise.¹⁰⁴

Among renewable energy sources, wind power may be one of the most significant. Currently, the United States invests in wind power, but increasing these investments could save billions of tons of carbon dioxide emissions. EPA estimates that “[e]very megawatt-hour (1,000 kilowatt-hours) of electricity generated by a wind turbine offsets the equivalent of 1,100 to 2,200 pounds of carbon dioxide, depending on the type of fuel used to generate the electricity.”¹⁰⁵ The American Wind Energy Association estimates that using wind instead of coal to produce electricity could reduce carbon dioxide emissions by ninety-nine percent, even when the emissions from the manufacture of the wind turbines and the building of wind plants is included.¹⁰⁶ It also suggests that “[i]f wind energy were to provide 20% of the nation’s electricity—a very realistic and achievable goal with the current technology—it could displace more than a third of the emissions from coal-fired power plants.”¹⁰⁷ Certainly, any program of corrective measures should include proposals for tax incentives, research and development funding, direct investments in renewable energy sources, and other means of promoting renewable energies, especially wind power.

In addition to promoting alternative energy sources, a program of corrective measures could encourage the United States to regulate carbon dioxide emissions from coal-fired electricity production facilities. A national cap-and-trade program for carbon dioxide could provide an economically efficient means to control carbon dioxide emissions from coal-fired power plants, among other sources. In fact, many states and even the U.S. Congress support these types of programs. For example, under the Regional Greenhouse Gas Initiative (RGGI),¹⁰⁸ seven northeastern states will undertake, beginning in 2009, to maintain steady carbon dioxide emissions levels from the power generation sector through 2015 when emissions will begin to decline, achieving a ten percent reduction by 2019.¹⁰⁹ Additionally, the U.S. Senate included as an amendment to its version of the Energy Policy Act of 2005 a statement promoting “a comprehensive and effective national program of mandatory, market-based limits and incentives on emissions of greenhouse gases that slow, stop, and reverse the growth of such emissions.”¹¹⁰

¹⁰⁴ The standard is similar to one proposed in The Renewable Energy and Energy Efficiency Investment Act of 2001. See *id.* at 4 (highlighting proposal by James Jeffords (I-VT), Diane Feinstein (D-CA), Joseph Lieberman (D-CT), John Kerry (D-MA), and Olympia Snowe (R-ME)).

¹⁰⁵ EPA, *Climate Change Technologies: Wind Energy*, available at [http://yosemite.epa.gov/oar/globalwarming.nsf/uniqueKeyLookup/SHSU5BWK54/\\$file/windenergy.pdf?OpenElement](http://yosemite.epa.gov/oar/globalwarming.nsf/uniqueKeyLookup/SHSU5BWK54/$file/windenergy.pdf?OpenElement).

¹⁰⁶ American Wind Energy Association, Wind Web Tutorial, How does wind stack up on greenhouse gas emissions?, available at http://www.awea.org/faq/tutorial/wwt_environment.html#How%20does%20wind%20stack%20up%20on%20greenhouse%20gas%20emissions.

¹⁰⁷ American Wind Energy Association, Wind Web Tutorial, What are the Environmental Benefits of Wind Power?, available at http://www.awea.org/faq/tutorial/wwt_environment.html#What%20are%20the%20environmental%20benefits%20off%20wind%20power.

¹⁰⁸ See Regional Greenhouse Gas Initiative, <http://rggi.org>.

¹⁰⁹ Regional Greenhouse Gas Initiative, *Frequently Asked Questions*, 3 (2005) available at www.rggi.org/docs/mou_faqs_12_20_05.pdf.

¹¹⁰ See Sen. Pete V. Domenici and Sen. Jeff Bingaman, *Design Elements of a Mandatory Market-Based Greenhouse Gas Regulatory System (White Paper)*, 1 (Feb. 2006) (setting forth the Senate’s statement).

Certain states have already taken important steps to reduce carbon dioxide emissions from coal-fired power plants, and political will exists to create and implement a national cap-and-trade program for carbon dioxide emissions. Thus, a program of corrective measures could encourage the United States to regulate carbon dioxide emissions, including the bulk of these emissions which result from coal-fired power generation, through an economically efficient cap-and-trade program.

B. Transportation

In 2003, the transportation sector in the United States contributed 25.6 percent of all carbon dioxide emissions resulting from fossil fuel combustion,¹¹¹ the second largest contributor behind electricity generation. Decreasing carbon dioxide and other greenhouse gas emissions in the transportation sector could occur via three different means—increased fuel efficiency, tail-pipe emission regulations, and alternative fuel choices. A program of corrective measures should include a combination of these methods to ensure drastic reductions in carbon dioxide emissions resulting largely from automobile use.

1. Fuel Efficiency Standards

The United States regulates fuel economy in newly manufactured vehicles by establishing a minimum standard for Corporate Average Fuel Economy (CAFE).¹¹² The standard for passenger vehicles is set at 27.5 miles per gallon (mpg),¹¹³ and the standard for light trucks is currently 21.6 mpg¹¹⁴ but set to increase to 22.2 mpg for the automotive model year 2007.¹¹⁵ The standard for passenger vehicles has not increased since 1985.¹¹⁶

According to the Union of Concerned Scientists (UCS), each gallon of gasoline that is consumed results in the release of “approximately 24 pounds of global warming pollutants.”¹¹⁷ If the United States increased its fuel economy standard to 40 mpg over the next decade, UCS estimates that the United States would reduce its annual GHG emissions by 106 million tons for

¹¹¹ EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2003*, 42 (Apr. 2005).

¹¹² “[CAFE] is the sales weighted average fuel economy, expressed in miles per gallon (mpg), of a manufacturer’s fleet of passenger cars or light trucks Fuel economy is defined as the average mileage traveled by an automobile per gallon of gasoline (or equivalent amount of other fuel) consumed[.]” National Highway Traffic Safety Administration, CAFE Overview, *available at* http://www.nhtsa.dot.gov/portal/site/nhtsa/template.MAXIMIZE/menuitem.d0b5a45b55bfbe582f57529cdba046a0/?javax.portlet.tpst=f2d14277f710b755fc08d51090008a0c_ws_MX&javax.portlet.prp_f2d14277f710b755fc08d51090008a0c_viewID=detail_view&javax.portlet.begCacheTok=token&javax.portlet.endCacheTok=token&itemID=199b8facdcfa4010VgnVCM1000002c567798RCRD&viewType=standard#1.

¹¹³ 49 U.S.C. §32902(b).

¹¹⁴ Department of Transportation, Summary of Fuel Economy Performance 3, (March 2005), *available at* <http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/Vehicle%20Safety/Articles/Associated%20Files/SummaryFuelEconomyPerformance-2005.pdf>.

¹¹⁵ 49 C.F.R. §533.5; *see also* National Highway Traffic Safety Administration, Laws/Regulations, *available at* <http://nhtsa.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/>.

¹¹⁶ Department of Transportation, Summary of Fuel Economy Performance 3 (Mar. 2005), *available at* <http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/Vehicle%20Safety/Articles/Associated%20Files/SummaryFuelEconomyPerformance-2005.pdf>.

¹¹⁷ Union of Concerned Scientists, Questions and Answers on Fuel Economy, *available at* http://www.ucsusa.org/clean_vehicles/fuel_economy/questions-and-answers-on-fuel-economy.html#6.

the year 2015.¹¹⁸ In addition, the Natural Resources Defense Council suggests that by increasing the standard to 40 mpg by 2015 and then to 55 mpg by 2025, carbon dioxide emissions could be reduced by 660 million metric tons.¹¹⁹ These stricter standards would, in the year 2025, reduce the amount of global warming pollution produced by passenger vehicles by thirty-five percent.¹²⁰

Increasing the CAFE standard is technically feasible considering what has been accomplished by other nations. Several nations regulate automobiles for either fuel economy or GHG emissions.¹²¹ A report prepared for the Pew Center on Global Climate Change shows that the United States has the lowest fuel economy averages both currently and throughout the projected future among the nations the report compared.¹²² Canada has proposed a standard of 32 mpg by 2010; the E.U. is projected to achieve an average of 44.2 mpg by 2008; Japan is projected to achieve an average of 48 mpg by 2010; and China is projected to achieve an average of 36.7 mpg by 2008.¹²³ U.S. manufacturers could comply with heightened standards, such as these, by increasing fuel economy generally, or by increasing that portion of their fleets composed of high efficiency vehicles.

2. Tail-pipe Emissions Regulations

The U.S. Clean Air Act (CAA) enables programs that significantly reduce carbon dioxide emissions from transportation-related fossil fuel combustion. Under the CAA, EPA sets national emissions standards for new motor vehicles, but California has unique authority to set its own stricter standards for new vehicles.¹²⁴ Other states, in turn, may implement plans to meet either the federal standards or California's stricter standards. Recently, California adopted new standards that now regulate carbon dioxide emissions.¹²⁵ The seven states that have adopted California's standards will also begin regulating carbon dioxide emissions.¹²⁶ New York State's Department of Environmental Conservation estimates that the state's adoption of the California standards will reduce light and medium duty vehicle GHG emissions by 14,855,500 carbon

¹¹⁸ *Id.*

¹¹⁹ Natural Resources Defense Council, A Responsible Energy Plan for America 6 (April 2005), *available at* <http://www.nrdc.org/air/energy/rep/rep.pdf>.

¹²⁰ *Id.*

¹²¹ Most of these nations, like the United States, base their regulations on sales-weighted averages of corporate vehicle fleets. China is a notable exception and regulates individual vehicles rather than fleets. Feng An & Amanda Sauer, Comparison of Passenger Vehicle Fuel Economy and Greenhouse Gas Emission Standards Around the World 21 (Dec. 2004), *available at* <http://pewclimate.org/docUploads/Fuel%20Economy%20and%20GHG%20Standards%5F010605%5F110719%20.pdf>.

¹²² *Id.* at 24. (The nations compared were United States, Canada, European Union, Japan, Australia, and China.). Conversion was required because of the different methods used to measure fuel economy—some nations measure kilometers traveled per liter of fuel consumed (km/L), others measure liters of fuel consumed per 100 km traveled (L/100km), while the EU measures grams of carbon dioxide emitted per km traveled (g/km). *Id.* at 18–22.

¹²³ *Id.*

¹²⁴ 42 U.S.C. §§ 7543(a)–(b).

¹²⁵ *Id.* §7507.

¹²⁶ Pew Center on Global Climate Change, State and Local Net Greenhouse Gas Emissions Reduction Programs: Greenhouse Gas Standards for Vehicles, *available at* <http://www.pewclimate.org/states.cfm?ID=51>.

dioxide equivalent tons per year in 2020.¹²⁷ A program of corrective measures could emphasize building on this initiative and creating a uniform national policy for automobile emissions.

3. Alternative Fuels

Increases in efficiency standards and tail-pipe emission regulations may be the least environmentally disturbing means of reducing the transportation sector's greenhouse gas emissions, but U.S. policy has been moving toward increased use of alternative fuels.¹²⁸ The large quantities of carbon dioxide emissions from the transportation sector could be mitigated through increased reliance on either substitutions for petroleum-based fuels or fuel additives that decrease the percentage of petroleum-based fuel consumed. Although the combustion of biofuels—biodiesel and ethanol—also emits greenhouse gases, the carbon released during the consumption of these biofuels is recycled during crop regeneration, generally causing no net addition of carbon dioxide to the atmosphere.¹²⁹ In 2003, in the United States, more than 2.8 billion gallons of ethanol was blended with gasoline, and in 2004, ethanol was blended into more than thirty percent of all U.S. gasoline; however, this accounted for only 2 percent of all the gasoline consumed in the United States in 2004.¹³⁰ Increasing this percentage could drastically reduce carbon dioxide emissions from the United States' transportation sector. The U.S. Department of Energy (DOE) suggests that “[b]y 2020, based on bioethanol production of 9.5 billion gallons per year, between 64.6 and 80.2 million metric tons of [carbon dioxide] emissions will be avoided each year.”¹³¹ Potentially, comprehensive use of bioethanol would emit 90 percent less net carbon dioxide than the reformulated gasoline currently in use.¹³² According to DOE, “[t]his reduction would have a tremendous impact on global [carbon dioxide] levels, making bioethanol an important component in U.S. efforts to reduce the threat of global climate change.”¹³³

Biodiesel, usually made from soybean oil or recycled restaurant grease, is another substitute for petroleum-based fuel. Biodiesel is primarily used by fleet operators, but more and more retail service stations are offering this type of fuel. Like ethanol, biodiesel recycles carbon dioxide and thus results in a net reduction of carbon dioxide emissions compared to fossil fuels. DOE predicts that producing biodiesel from soybeans reduces net emissions by nearly eighty percent.¹³⁴ A program of corrective measures could achieve significant carbon dioxide emission reductions if it incorporated incentives to both manufacture automobiles that could support either

¹²⁷Press Release, New York State Department of Environmental Conservation, State Environmental Board Approves New Vehicle Emissions Standards (Nov. 9, 2005) *available at* <http://www.dec.state.ny.us/website/press/pressrel/2005/2005131.html>.

¹²⁸See BBC News, *Europe Biofuel Plans Under Fire* (Jan. 12, 2006), *available at* <http://news.bbc.co.uk/1/hi/business/4607258.stm>.

¹²⁹EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2003* 51 (Apr. 2005).

¹³⁰Dep't of Energy, Energy Efficiency and Renewable Energy: Biomass Program: Biomass FAQs, *available at* http://www1.eere.energy.gov/biomass/biomass_basics_faqs.html.

¹³¹Dep't of Energy, *Biofuels: Bioethanol—the Climate-Cool Fuel*, *available at* <http://www.nrel.gov/docs/legosti/fy98/23761.pdf>.

¹³²*Id.*

¹³³*Id.*

¹³⁴Dep't of Energy, Energy Efficiency and Renewable Energy: Biomass Program: Environmental Benefits, *available at* <http://www1.eere.energy.gov/biomass/environmental.html>.

high ethanol blended gasolines or biodiesel and to make these alternative fuels readily available to consumers.

C. Appliance Efficiency

In addition to alternative energy sources or regulation of emissions, a program of corrective measures could include measures to reduce energy consumption generally. The United States already has a program called Energy Star that promotes energy efficiency, but this program could be strengthened to gain even further reductions in greenhouse gas emissions. In 2004, this program saved enough energy to power twenty-four million homes and avoided greenhouse gas emissions equivalent to the emissions from twenty million cars.¹³⁵ EPA expects to prevent 50 million metric tons of carbon dioxide equivalent in greenhouse gases per year over the course of the next decade.¹³⁶ A cornerstone of the Energy Star program is its standards for appliance efficiency. However, two products with the largest potential energy savings have yet to be included in DOE's proposed new energy efficiency standards for appliances—refrigerators and furnace fans.¹³⁷ Continued efforts to build on and expand energy efficiency in the United States could be recommended as a significant part of a program of corrective measures.

VI. Conclusion

Waterton-Glacier's status as an International Peace Park underscores the importance of the international nature of environmental treasures and the cooperation necessary to protect it. That cooperation is needed now, more than ever, and Petitioners urge the World Heritage Committee, the global community, and especially the United States and Canada to work together to preserve the natural and cultural heritage of Waterton-Glacier International Peace Park. If action is not taken, scientists predict the glaciers will have disappeared by 2030. As former U.S. Secretary of the Interior Bruce Babbitt said in 1998, "It's increasingly hard to understand why it's called Glacier National Park, because the glaciers are getting hard to find."

¹³⁵ EPA, *Investing in Our Future: Energy Star and Other Voluntary Programs: 2004 Annual Report 3* (Sept. 2005), available at http://www.energystar.gov/ia/news/downloads/annual_report2004.pdf.

¹³⁶ *Id.*

¹³⁷ American Council for an Energy Efficient Economy, *Coalition Praises DOE for First Step Toward Setting New Energy-Saving Appliance Standards: But Proposed Schedule Ignores 2 Key Products, Must be Made Binding* (Feb. 1, 2006) (press release), available at <http://www.aceee.org/press/0602doeasapsched.html>.