TESTIMONY SUBMITTED

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TO THE

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SUBCOMMITTEE ON PRIVATE SECTOR AND CONSUMER SOLUTIONS TO GLOBAL WARMING AND WILDLIFE PROTECTION

FOR THE

GLOBAL WARMING AND WILDLIFE HEARING

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The National Wildlife Federation appreciates the Senators' efforts today to take an in-depth look at the impacts of global warming on wildlife. The National Wildlife Federation is America's largest wildlife conservation organization, representing more than 4 million members and supporters throughout the United States, including nearly 750,000 hunters and anglers. The National Wildlife Federation includes 47 affiliated state and territorial conservation organizations, which in turn support hundreds of local clubs across the nation. We are a non-partisan organization, and our membership mirrors the political diversity of Americans everywhere.

The National Wildlife Federation represents a 'big tent' of wildlife enthusiasts – gardeners, hunters, anglers, birdwatchers, naturalists, educators, children, and others – who are united by our mission of protecting wildlife for our children's future. Our signature children's publication, *Ranger Rick*, is an American icon that heralds the joy and wonder of wildlife in our backyards and throughout the world.

Global warming is the most dangerous threat to the future of wildlife, and we have a moral responsibility to take action now before it is too late. The National Wildlife Federation is confident America can be a global leader in solving global warming if we act with the urgency and determination with which we have successfully confronted past threats to our security and to wildlife.

For the first time in history, we are nearing the tipping point in an ecological crisis that could see wholesale loss of wildlife populations and profound changes in our outdoor experiences. Wildlife species are ill-prepared to meet the threat of global warming's rapid and disruptive climate changes, which extend well beyond temperature changes to include a much broader array of threats to vital habitat. Rising sea levels, drying wetlands, changing water temperatures, more favorable climates for wildlife pests and diseases, and shifting vegetation zones are some of the manifold dangers that make global warming a deadly threat to wildlife.

A study in the journal *Nature* concluded that, within the next 50 years, as many as a third of wildlife species in some regions worldwide could be headed for extinction because of global warming (Thomas et al., 2004).

The threat of global warming to wildlife was vividly illustrated by the U.S. Fish and Wildlife Service's proposal on December 27, 2006, to list the polar bear as a threatened species. Secretary of the Interior Dirk Kempthorne stated that "the polar bears' habitat may literally be melting."

Species that survive global warming may nevertheless undergo large population reductions. For example, global warming-induced drought conditions in the Prairie Pothole Region of central North America could dry up vital wetlands and lead to a two-thirds decline in the abundance of ducks breeding in the region. This will affect mallards, gadwall, blue-winged teal, northern pintails, canvasbacks, redheads and ruddy ducks throughout North America's flyways.

The rapid pace of climate change is already unraveling the tapestry of life in entire ecosystems. In Alaska, Canada and parts of the continental United States, millions of acres of forest have been wiped out in recent years by beetle outbreaks brought about by warmer winters. Warmer, drier conditions due to global warming have caused a four-fold increase in the number of major wildfires in western forests. Some parts of the Caribbean have lost as much as 80 percent of their coral reefs as oceans warm.

These and other threats to wildlife are detailed in a collection of educational reports and materials available on the National Wildlife Federation's website at www.nwf.org/globalwarming.

The remainder of my testimony is divided into the following sections:

- The recent landmark assessment of scientific consensus on global warming
- Opinions of hunters and anglers on global warming
- Global warming and America's wildlife
- Economic importance of wildlife
- Solving global warming
- Additional steps needed to protect wildlife from global warming
- Concluding Remarks

Landmark Assessment of Scientific Consensus

The release on February 2, 2007, of the most recent scientific consensus report by the Intergovernmental Panel on Climate Change (IPCC) should be the final wake up call to Congress after years of procrastination and delay (Intergovernmental Panel on Climate Change 2007). The report is the culmination of decades of research and of unprecedented scientific collaboration by more than 2,500 scientists worldwide. The report is based entirely on research published only in peer-reviewed scientific journals.

In the wake of this report, IPCC chair Rajendra Pachauri warns, "Clearly we are endangering all species on Earth."

We have moved past the threshold of doubt. According to the report, an overwhelming body of evidence indicates that humans are causing global warming:

- The amount of carbon dioxide—the most significant greenhouse gas—in the planet's atmosphere has increased to a level that "exceeds by far the natural range over the last 650,000 years," primarily as a result of burning fossil fuels such as oil and coal.

- Average global temperatures have increased by about 1.5 degrees Fahrenheit over the past century. This warming is "unequivocal" and accelerating. Globally, 11 of the last 12 years rank among the 12 warmest on record since 1850.

- Scientists are more certain than ever that the warming is being driven mostly by pollution that human activity is pumping into the atmosphere.

- This seemingly modest increase in temperature has already had destructive consequences and more likely than not has helped fuel the increase in intense hurricanes in recent years.

- Higher temperatures and reduced rainfall have contributed to an increase in the intensity and duration of droughts.

- Sea levels have risen because of melting ice sheets and warming waters, and the rate of rising sea levels has about doubled in the past decade compared to the past 50 years.

The report warns of dramatically more rapid warming in coming decades if we continue to use fossil fuels such as oil and coal as intensively as we do today. Global warming is accelerating because pollution is building up in the planet's thin atmosphere at a faster rate as we use more and more fossil fuels. Moreover, we have not yet seen the full effects of the pollution we have already pumped into the air. Warming over the next two decades will occur at about twice the rate of the past 50 years. By the end of this century, if we continue to depend heavily on fossil fuels, the scientists' consensus 'best estimate' is that temperatures will increase 7 degrees Fahrenheit above the changes we have already seen (with a range of 4 to 11 degrees, based on the report's 'Fossil-Intensive' emissions scenario).

To put this change in perspective, consider the report's description of the state of the planet 125,000 years ago, when average polar temperatures were 5 to 10 degrees Fahrenheit warmer than today because of differences in the Earth's orbit. Under those conditions, oceans were likely 13 to 20 feet higher than they are now. To repeat such a scenario in the modern world will have almost unimaginable consequences. More than 300 million people live within 1 meter of average sea-level and a third of the world's population live near the coast. If temperatures rise as predicted, the world's maps literally will have to be redrawn. Dr. James Hansen, director of NASA's Goddard Institute for Space Studies and one of the world's foremost experts on global warming, has warned that level of change would create a "different planet."

The report also warns of dramatic changes in the world's oceans beyond the expected increases in sea levels. The scientists conclude that it is very likely that Atlantic Ocean currents will slow down this century. Further, they warn that the buildup of carbon dioxide in the atmosphere will lead to increasing acidification of the ocean; a factor that a number of scientists in other studies have warned will threaten marine life and fisheries.

The stakes of further delay are enormous, and the clock is running out for wildlife. According to the report, the global warming pollution we emit in coming years "will continue to contribute to warming and sea level rise for more than a millennium, due to the timescales required for removal of this gas from the atmosphere."

It is imperative that this Congress and the current Administration come to terms with the urgency of global warming and take meaningful and significant action to reduce the nation's global warming pollution. Dr. Richard Alley, one of the lead authors of the IPCC report and a professor at Pennsylvania State University, summed up the report's implications as follows: "Policy makers paid us to do good science, and now we have very high scientific confidence in this work — this is real, this is real, this is real. So now act, the ball's back in your court."

Opinions of Hunters and Anglers on Global Warming

The United States is home to more than 40 million hunters and anglers, and they have been a powerful force for conservation in America. In 2006 the National Wildlife Federation commissioned Responsive Management of Harrisonburg, Virginia, to conduct a nationwide non-partisan survey of hunters and anglers on the issue of global warming. Responsive Management, one of the most respected non-partisan research firms on sportsmen attitudes, is used widely by state governments and others. Respondents were randomly selected, largely from the pool of people who have recently purchased hunting and fishing licenses.

This first-ever comprehensive nationwide survey of licensed hunters and anglers about their attitudes on global warming provided quantifiable evidence of what our members have been telling us: A vast majority of sportsmen are witnessing the effects of global warming and believe immediate action is necessary to address it. According to the survey, 85 percent of sportsmen believe we have a "moral responsibility to confront global warming to protect our children's future." Eighty percent of sportsmen believe the United States should be a world leader in addressing global warming. Seventy-five percent agree that Congress should "pass legislation that sets a clear national goal for reducing global warming pollution with mandatory timelines because industry has already had enough time to clean up voluntarily." Additional findings are included in the attached report and are available online at www.TargetGlobalWarming.org.

The polling firm, Responsive Management, has noted that some surveys "whisper" their results, but these results "shout" loud and clear. In a nation too often divided on major policy issues, America's hunters and anglers have reached a clear consensus that, on the issue of global warming, now is the time to act.

The sportsmen constituency is influential nationwide. Approximately one out of every five voters is a hunter and/or angler. One sportsman in six belongs to a labor union, and one in seven is a farmer or rancher. According to the survey, 50 percent of sportsmen identify themselves as evangelical Christians. In fact, sportsmen have a wide range of political views but tend to identify themselves as politically "moderate" (37 percent) or conservative (36 percent).

Global Warming and America's Wildlife

For too long we have ignored nature's warnings. As far back as 1950, 10 years before her landmark book Silent Spring, Rachel Carson wrote of a "startling alteration of climate." Pointing to birds appearing in far northern lands for the first time, melting glaciers and other signs in nature, she warned that "the pendulum is swinging."

Decades of wildlife and climate studies have made it clear that global warming threatens to overwhelm wildlife in the United States and throughout the world with a host of climate-influenced threats. As conveyed by the Bush Administration to Congress in 2004, "Analyses based on a large number of studies of plants and animals across a wide range of natural systems worldwide have found that many species have shifted their own geographic ranges or changed temperature-sensitive behavior—such as migration, flowering, or egg-laying, in ways consistent with reacting to global warming" (U.S. Climate Change Science Program, 2004).

Furthermore, a report by The Wildlife Society, the pre-imminent association of wildlife professionals in North America, provides a comprehensive assessment of global warming's likely consequences for North American wildlife and concludes that "the effects of climate change and variability on wildlife simply cannot be ignored" (Inkley *et al.*, "Global Climate Change and Wildlife in North America," 2004).

Although the Earth's climate has changed periodically throughout the past, the current global warming caused by the burning of fossil fuels is uniquely different because it is occurring at an unprecedented rate. Rapid global warming also is occurring at a time when wildlife habitat has been fractured and lost to development and other pressures, limiting the ability of wildlife to adapt. Disruption of habitat by global warming is further opening the door to the latest invasive species that threaten America's wildlife. The link between wildlife and climate is highlighted in several examples below:

Waterfowl:

North America's wetlands support a rich abundance and diversity of waterfowl and other wildlife that have many important economic, ecological, recreational, and aesthetic values. But climate-driven changes in wetland ecosystems may profoundly affect future waterfowl populations and other wetland-dependent species. In the Prairie Pothole Region, the single most important breeding ground for North American migratory waterfowl, the effects of global warming on their abundance could be drastic, reducing migratory waterfowl populations throughout North America. Sorenson et al. (1998) used model projections of future drought conditions in the Prairie Pothole Region to project trends in wetland and duck abundance during the 21st century. Most scenarios and models projected significant declines in wetlands (ranging from no change to 91% declines), and thus declines in the abundance of breeding ducks (losses ranging from 9% to 69%) in this region by the 2080s.

Trout, Salmon and Steelhead

America's prize cold-water fish, including trout and salmon, are imperiled by global warming. As the average temperature of our atmosphere increases, there is an associated increase in the temperatures of many rivers, streams, and other bodies of water, particularly when the air temperature remains at a certain level over time periods of a week or longer (Rahel, Keleher, Anderson, 1996). Water temperatures are among the most important factors affecting the health and distribution of trout, salmon and steelhead—collectively called salmonids (McCullough, 1999).

Temperatures above optimal conditions can influence cold-water fish in each of their life stages (Kyle & Brabets, 2001). Just a few degrees increase in temperature above their optimum range can affect salmonids in many ways, including changing migration timing, reducing growth rates, reducing available oxygen in the water and increasing susceptibility to toxins, parasites, and disease (Poole et al., 2001). In general, salmonids will not be found where river temperatures are outside the optimum range for an extended period of time. The "thermal limit" for most adult salmon, steelhead and trout species occurs where the average daily air temperature in the warmest summer months exceeds 69.8° F (21° C) (McCullough, 1999). Salmonids exposed to water temperatures at or above 71.6° F (22° C) over several days are impaired or will die (Ministry of Water, Land, and Air Protection, 2004).

The U.S. Environmental Protection Agency projects that a 4.5° F (2.5° C) increase in average stream temperatures will yield a 50- to 100-percent reduction in cold-water fish habitat in many New England, Great Lakes and western states (U.S. EPA, 1995). Other research estimates that an increase in average summer water temperatures of 4.5 to 11° F (2.5 to 6° C) could eliminate 21 to 42 percent of stream habitat for the nation's trout and salmon species (O'Neil, 2002).

Polar Bears

A circumpolar species with its southernmost population in Hudson Bay, Canada, the polar bear is dependent upon sea ice from which it catches seals, its primary prey. In western Hudson Bay the duration of ice has declined by 20 days in just 20 years, forcing polar bears to spend longer periods on shore where little food is available. As a result, average weight of polar bears in this area is down by 15% in 20 years, leading to lower reproduction and a 20% or more population decline.

In the Arctic Ocean, perennial sea ice has declined 9.8 percent per decade since 1978, with a 32 percent thinning of the remaining ice from the 1960s and 1970s to the 1990s in some local areas. In a recent four year period Arctic Sea ice declined by an area three times that of California. (Folkestad, 2005) A recent study revealed that Arctic summer sea ice may disappear entirely by 2040. (Holland 2006) Already, adult polar bears are experiencing weight loss and lower cub survival in both Canada and the Southern Beaufort Sea in Alaska. Furthermore, in 2004 biologists observed four drowned polar

bears and others swimming an incredible 50 miles from the coast in open ocean, occurrences that have not previously been documented.

Due to the rapid decline in sea ice accompanied by declining weights, reproduction and populations of polar bears in some areas, the U.S. Fish and Wildlife Service, in a preliminary review of the evidence currently available, determined in December 2006 that the polar likely warrants listing as a threatened species.

Songbirds

Although migratory birds may appear to be particularly suited for adapting to climate global warming because of their ability to move, they may not be well adapted to the new prey, predators, competitors and habitat conditions that changing climate could force upon them (Price & Glick, 2002). Their optimal habitats will no longer exist, at least in the short term (Price & Root, 2001). The number of neotropical migrant bird species is expected to decrease throughout the contiguous United States as bird ranges shift in response to global warming. For example, the southwestern United States could lose 29 percent of its current neotropical migrant bird species (Price & Root, 2001). American goldfinches may no longer breed in much of the United States. Savannah sparrows, sage thrashers and other birds that keep outbreaks of rangeland grasshoppers in check may disappear from Arizona, Nevada and New Mexico (Price & Glick, 2002).

Migratory birds also may face declines in such key food sources as seeds, insects and other foods, affecting bird health for migration and breeding (Price & Glick, 2002). As sea levels rise, populations of shorebirds and other birds that rely on coastal marshes could be reduced (Erwin, 2001). Van Riper *et al*. (1997) found that the endangered southwestern willow flycatcher has seen its numbers plummet during the past 100 years from the loss of its habitat along rivers, streams or other wetlands in southern California, Arizona, New Mexico and parts of Nevada, Utah, Colorado and Texas. Global warming could exacerbate the habitat loss by restricting water flow even further, hurting fish and wildlife as well as songbirds.

Coastal Habitats and Oceans

A significant increase in the rate of sea-level rise due to melting glaciers and ice caps and to thermal expansion of the oceans is one of the most direct consequences of global warming, putting many of the nation's low-lying coastal areas at considerable risk. Sea-level rise is expected to contribute to significant coastal erosion as well as to inundation of coastal wetlands, marshes and other habitat important to many fish and wildlife species. This development threatens not only the fish and wildlife that depend on this habitat but also the security and economy of coastal communities that rely on these buffer zones to help reduce the impacts of hurricanes, storm surges and other severe weather events.

A recent study of sea-level rise in Florida, for example, found that nearly 50 percent of critical salt marsh and 84 percent of tidal flats at nine important coastal sites would be

lost under a moderate 15-inch increase in average sea level (Glick and Clough, 2006). The area of dry land at these coastal sites is projected to decrease by 14 percent, and roughly 30 percent of ocean beaches and two-thirds of estuarine beaches would disappear. The area of brackish marsh is projected to increase more than 40-fold, mostly around Apalachicola, taking over much of the current hardwood swamp land. These changes would have a significant impact on Florida's marine fish and shellfish species and, accordingly, on the state's commercial and recreational fisheries.

Loss of coastal wetlands will likely be exacerbated by other human-induced stressors, such as groundwater withdrawal, wetland drainage and levee construction. In Louisiana, for example, a combination of sea-level rise and these other factors has already contributed to a loss of close to 1 million acres of coastal wetland since 1900 (USGCRP, 2000). With the rate of sea-level rise projected to accelerate during the next century, the losses in this and other regions are likely to be catastrophic - particularly in areas where dikes, levees and other developments hinder the ability of wetlands to shift inland (Glick, Inkley and Tufts, 2001).

In addition to sea level rise, global warming also is raising ocean temperatures. On average, the temperature of the upper 300 meters of the world's oceans rose about 0.5 degree Fahrenheit since the 1950s, a trend that scientists have determined is a direct result of human activities (Barnett, Pierce and Schnur, 2001). In the Tropical Atlantic, average sea-surface temperatures have warmed 1 degree Fahrenheit during the past three decades. These higher sea-surface temperatures are damaging coral reefs, enhancing marine diseases and harmful algal blooms and making hurricanes more intense and destructive. For example, two recent studies have offered compelling evidence that hurricanes around the world have become increasingly intense over the past 35 years, a trend attributed to warmer ocean temperatures fueled by global warming (Emanuel, 2005; Webster, *et al*., 2005).

The rise in severity of storms not only affects vulnerable human populations but wildlife and their habitats as well. Increased storm surge and mean tide levels could alter disturbance regimes in shallow coastal waters that in turn would influence the composition and productivity of sea grasses and benthic fauna vulnerable to changes in sedimentation patterns, current velocity and turbidity (Inkley et al., 2004).

Fish and Wildlife of the American West

Global warming is already having a significant impact on fish and wildlife habitat across the American West, and studies show that the effects will become even more extensive in the coming decades if global warming pollution continues unabated. One of the greatest concerns about global warming in the West is the impact on the region's water resources. Winter snowpack accounts for 75 percent of the water supply in the West and is the primary source of water in many areas in dry summer months as the snow melts in high altitude mountains (Glick, 2006). Global warming is expected to contribute to a significant reduction in average snowpack across the region, as well as earlier spring snowmelt. Mountains in the Pacific Northwest are projected to lose as much as 88

percent of average snowpack by 2090; the Central Rocky Mountains could lose up to 75 percent by 2090; and the Sierra Nevada range could lose up to 74 percent of snowpack within the next 30 years (McCabe and Wolock, 1999).

Another serious consequence of global warming in the West is an increase in the incidence and severity of wildfires, a problem made even worse by decades of fire suppression, extensive grazing and other factors. New research reveals that wildfires in western forests have become much more frequent and larger since the mid-1980s, a trend that corresponds with warmer springs and the expansion of summer dry periods (Westerling, 2006). Across the region, there has been a four-fold increase in the number of major fires each year and a six-fold increase in the area of forest burned since 1986 compared to the period between 1970-1986. These recent trends have occurred during a period when land use practices have not changed significantly from the period prior to the shift, which underscores the role that climate-related variables are playing in wildfire activity in the region. This trend will continue if global warming continues unabated, with devastating consequences for people and wildlife alike. One study, for example, projects that the overall area of acreage burned will double in size across 11 western states if the average summertime temperature increases 2.9 degrees Fahrenheit between 2070-2100 (McKenzie, et al., 2004).

Economic Importance of Wildlife

Fish and wildlife play an integral role in the U.S. economy. In 2001, more than 82 million adults participated in hunting, fishing and wildlife watching, spending more than $108 billion and supporting more than 2.6 million jobs across the nation (U.S. FWS, 2001). With these numbers, the economic importance of hunting, fishing and wildlife watching is comparable to that of the seventh largest corporation in America, with nearly as many employees as the U.S. computer industry (NWF & IAFWA, 2005).

Beyond hunting, fishing and wildlife watching, which focus directly on fish and wildlife resources, abundant fish and wildlife enhances all outdoor activities. A recent study by the Outdoor Industry Foundation revealed that active outdoor recreation, which includes camping, fishing, hunting, paddling, hiking and wildlife viewing, contributes a total of $730 billion annually to the U.S. economy, supports 6.5 million jobs (1 in 20 U.S. jobs), generates $88 billion in federal and state tax revenue and stimulates 8 percent of all consumer spending. To date, no one has estimated what percentage of this economic activity would be lost under various global warming scenarios. However, the EPA estimates that potential economic losses to U.S. cold-water recreational fishing alone from global warming could be $1.3 billion to $3 billion yearly. (Julius, 2001)

Global warming is projected to have devastating impacts on coral reefs which support a commercial and recreational fishing industry around the world worth billions of dollars. The reefs of the Florida Keys alone generated $4.4 billion in tourism revenues in 2000-01. (Scott, 2005) Global warming has placed coral reefs, their fish and wildlife, and their economic benefits in serious jeopardy.

Conserving wildlife and ecosystems has many economic benefits to people beyond those that are quantified in the marketplace. Ecosystems perform fundamental life support services without which human civilizations would cease to thrive. (Daily et al., 1997) These include the purification of air and water, detoxification and decomposition of wastes, regulation of climate, regeneration of soil fertility and production and maintenance of biodiversity. (Boyd et al., 2006; Salzman et al., 2005; Daily et al., 1997) Agricultural, pharmaceutical, commercial fishing and numerous other industries that draw on natural resources sectors depend on healthy ecosystems. For these industries, which represent large portions of the economy, face potentially significant potential for disruption of current harvesting practices and livelihoods under global warming scenarios. (Malcolm et al., 2000)

A significant reduction in the ability of the pharmaceutical industry to harvest wild plants for research also would have large negative consequences for medical practices. Of the top 150 prescription drugs used in the United States, 118 are derived in whole or in part from plants and other natural sources. Nine of the top ten drugs are based on natural plant products. The commercial value of pharmaceuticals in the developed nations exceeds $40 billion per year. (Daily et al., 1997)

The agricultural sector also has much to lose if global warming scenarios unfold as projected and wildlife declines. One third of human food is derived from plants pollinated by wild pollinators. If birds, bats, butterflies and other natural pollinators decline because of global warming, yields of important crops would likewise decline. In the United States alone, the value to the agricultural industry of native pollinators sustained by natural habitats is estimated in the billions of dollars per year. The agricultural industry is also heavily dependent on abundant wildlife and healthy ecosystems for pest control. Roughly 99 percent of potential crop pests are controlled by natural enemies such as birds and spiders. Wildlife species save farmers billions of dollars annually by protecting crops and reducing the need for chemical control. (Daily et al., 1997)

Solving Global Warming

The action we take to solve global warming can simultaneously drive a transformation in how we produce and use energy, yielding far-reaching benefits for our economy, for our energy security and independence from foreign oil, and for the health of children jeopardized by air pollution.

The National Wildlife Federation asks Congress to act now to set enforceable, science-based goals to reduce U.S. global warming pollution, bolstered with new laws to promote renewable energy and more energy efficient vehicles, appliances and buildings. The *Agenda for a Clean Energy Future to Combat Global Warming*, supported by the National Wildlife Federation and 15 other leading conservation and environmental groups, is attached (and available online at www.saveourenvironment.org).

By starting now to cut global warming pollution levels 2 percent annually and setting concrete goals to cut emissions 20 percent every decade, we can reduce our pollution

levels a total of 80 percent by mid-century. After enacting such a plan, the U.S. will be positioned to provide global leadership and to encourage other nations to do their share to help stabilize our climate.

This plan will be effective because global warming is being driven largely by carbon dioxide pollution from fossil fuels we use as our primary sources of energy, particularly oil and coal. Every minute, we emit 25 million pounds of carbon dioxide into the atmosphere in the United States. The oil used for transportation and the coal used in power plants to generate most of the electricity we use in our homes and offices together account for about two-thirds of U.S. global warming pollution from energy. By cutting pollution from these and other sources 2 percent annually, we are likely to prevent the planet from warming more than an additional 2 degrees Fahrenheit—a potential 'tipping point' threshold scientists are warning we must not exceed if we are to avoid the most severe risks of global warming.

Without urgent action, the Department of Energy projects that our dependency on fossil fuels will climb dramatically in coming years, resulting in a 37 percent increase by 2030 in carbon dioxide pollution from oil and coal. (DOE, 2007) In short, if current energy practices persist, we will make the problem worse and worse every year, adding to the pollution legacy we are leaving our children.

Because our growing dependency on fossil fuels is at the heart of the global warming crisis, a transformation in how we produce and use energy is a cornerstone for building a safer climate future. We can diversify our energy sources with clean alternatives such as wind and solar power as well as with a new generation of advanced, sustainably managed biofuels crops. As we wean ourselves from our over-reliance on oil and coal, we can greatly improve our energy security and stabilize energy prices to avoid the radical jolts we have experienced at the gas pump. We can also keep more of America's hard-earned money here to bolster our economy rather than shoveling it overseas.

The Apollo Alliance, a coalition of national labor unions and other partners, has estimated that a bold program of investments in clean-energy technology will create more than 3 million high-wage jobs in construction, manufacturing and industrial machinery by 2015 and expand the economy by $330 billion. These estimates echo the findings of a government commission which, in 1999, determined that clean energy investments are critical to help U.S. firms "capture much of the $10 trillion which will be spent worldwide for energy supply technologies over the next 20 years."

By applying today the same leadership to global warming that Congress applied to other air and water pollution threats in the past, Congress can secure our environmental and economic future. Since the Clean Air Act was signed in 1970, America has cut in half the emissions of the six common air pollutants for which air quality standards have been established. What has been good for our environment has been good for our economy, which has almost tripled during that time. Cleaning up our environment has created new opportunities for entrepreneurs and engineers. America's environmental technology

sector today generates more than $220 billion annually and supports 1.6 million jobs in more than 50,000 firms.

We ask Congress to show the same determination to get the job done when it comes to reducing global warming pollution. If Congress sets clear goals and safeguards to curb pollution, American industry will become the driving force behind solving global warming.

Recently, a coalition of some of America's leading companies and major emitters of greenhouse gases, including GE, Alcoa, BP, DuPont, Duke Energy, and Caterpillar, called for Congress to enact legislation to curb global warming pollution by 10 to 30 percent below current levels within 15 years and by 60 to80 percent by 2050. The coalition warns that "any delay in action to control emissions increases the risk of unavoidable consequences that could necessitate even steeper reductions in the future."

These companies, which have voluntarily stepped forward to take action, have clearly demonstrated that technologies exist today to reduce emissions significantly. Companies that have set goals for reducing emissions have been able to achieve those goals consistently ahead of schedule and at a corporate profit. For example, BP, one of the world's largest energy companies, met its internal greenhouse-gas-reduction target in 2001, nine years ahead of schedule, reducing emissions by 18 percent and saving $650 million over three years after an initial investment of $20 million.

As documented in the report *Carbon Down, Profits Up,* five global companies, including IBM and DuPont, have achieved greenhouse gas reductions of 60 percent or more with combined savings of more than $5.5 billion from improved energy efficiency, fuel switching and reduced waste.

Beyond the economic opportunity of shifting money from fossil fuels to clean energy, it also is important to consider the economic impacts of global warming if we fail to act. A recent report by a United Kingdom commission chaired by Sir Nicholas Stern, former chief economist of the World Bank, found that global warming could reduce world economic output by as much as 20 percent if we fail to take action. In contrast, the cost of taking steps to reduce worldwide pollution significantly would only amount to perhaps 1 percent over a period of decades.

With more frequent weather extremes – heat waves, droughts, and heavy precipitation events – and more intense hurricanes, we are already experiencing the economic impacts of more frequent natural disasters. According to Munich Re – a leading insurance provider – the insurance industry has experienced a massive increase in the frequency and cost of natural disasters in recent years. Between 1994 and 2005 there were nearly three times as many weather-related natural disasters than during the 1960s. The trend is even clearer in light of the economic losses, which increased by more than a factor of five in the same period. (Munich Re, 2007).

2004 was a record year for hurricane damages. The insurance industry had to pay a record $30 billion for losses caused by North Atlantic hurricanes, especially in the United States and the Caribbean. Losses in 2005 more than doubled this record – topping $83 billion (Munich Re, 2007).

There are numerous opportunities to reduce global warming pollution from a variety of sources and set us on a course that can minimize the economic damages of global warming. Consider the opportunities to address one key contributor to global warming – our skyrocketing dependence on oil. The fuel-economy of cars and SUVs sold today is, on average, worse than it was 20 years ago. Indeed, fuel-economy standards have not been updated significantly since the era of the 8-track tape player.

The National Academy of Sciences concluded in 2002 that we have the technologies today to make far more fuel efficient cars of all sizes (National Research Council, 2002). But without Congressional leadership, little has been done to get those technologies into the cars we drive.

In contrast to our lack of progress on fuel economy, consider the innovation that has occurred over this time period: the personal computer, the Internet, mobile phones. The space shuttle, first launched in 1981, is today considered an "old" technology that NASA plans to shut down within four years. With the right leadership, we can put America's entrepreneurial and technology leadership to work for our planet.

Many nations have already begun moving down this path and are far ahead of the United States in cutting pollution and promoting clean energy. Most industrialized nations have signed the Kyoto Protocol – an international treaty to curb global warming pollution. Even some major developing nations are taking bold steps. China has tougher fuel economy standards for motor vehicles than the United States and has recently established goals to promote renewable energy and energy efficiency.

Without the leadership of the United States, which accounts for one-quarter of the world's global warming pollution, the bold global pollution reductions needed in coming decades will not get done. The United States has the industrial strength and ingenuity to lead the way with low-pollution technologies, and it's time we became a world leader in confronting global warming.

Fortunately, state and local governments have not been standing still despite the lack of action in Congress. Representing more than 55 million Americans, there are now 369 mayors who have signed onto the U.S. Mayors Climate Protection Agreement to curb emissions in their municipalities. California has enacted laws to cut emissions by 25 percent by 2020, and a dozen states have set new standards to curb carbon dioxide emissions from tailpipes of new cars and SUVs.

Additional Steps Needed to Protect Wildlife from Global Warming

In addition to reducing global warming pollution, Congress and the Administration need to take steps to fund and manage America's wildlife resources better in preparation for the climate changes already underway.

The Wildlife Society (Inkley *et al*., 2004) has identified many actions wildlife managers should be implementing now to ameliorate the effects of global warming on wildlife. These management actions include protecting coastal wetlands to allow for sea level rise, reducing the risks to wildlife from potential catastrophic events, adjusting yield and harvest models, accounting for known climatic variations and taking global warming into consideration when selecting the location and other characteristics of conservation areas. Wildlife managers also need to expect the unexpected and to reduce non-climate stressors on ecosystems.

Overall, wildlife managers can minimize negative impacts to wildlife and take advantage of positive aspects by planning ahead and employing adaptive management. However, absent funding to implement these recommendations now, fish and wildlife resources will be less able to endure the challenges of global warming.

An important way to help fish and wildlife survive the impacts of global warming is to provide a dedicated, stable source of funding to state wildlife agencies, allowing the states to prepare locally for the impacts of a changing climate. State fish and wildlife agencies are at the forefront of the conservation, protection and restoration of fish and wildlife. They are best positioned to work through cooperative partnerships to assist fish and wildlife in adapting to the changes caused by global warming. But, they lack adequate resources for taking on the challenge of protecting wildlife from global warming. The FY05 federal appropriation of $61 million to the states through the State Wildlife Grants program is far short of what states need to conserve successfully our rich fish and wildlife heritage. State agencies need a guaranteed source of annual funding for climate adaptation that supplements the annual congressional appropriation for State Wildlife Grants.

Accordingly, the National Wildlife Federation and 375 sportsmen groups, state fish and wildlife agencies, conservation groups and scientific societies have requested that any climate legislation include dedicated funding for the Wildlife Conservation and Restoration Account of the Pittman-Robertson Act, which funds the State Wildlife Grant Program (letter attached). By using the well-established structure of this account, a part of one of America's landmark conservation laws, funds derived from a market-based regulatory system would be efficiently and fairly distributed to the states.

For years, sportsmen have been paying license fees to help support the many successful conservation programs that have sustained our wildlife populations. But industrial pollution is threatening to undermine our conservation success throughout the nation. Polluters should contribute their fare share to sustaining wildlife populations. Adequate and consistent funding for the Wildlife Conservation and Restoration Account of the Pittman-Robertson Act is essential to enable states to meet the challenges facing wildlife from global warming.

Congress will also need to fund the work of federal managers of land, water and wildlife so that these agencies can help ensure that wildlife populations within their jurisdictions survive global warming. To date, very few federal agencies have updated their management plans to confront this leading threat to wildlife. Billions of dollars in conservation investments made by Congress in the past several decades are at risk of being lost if the federal government fails to adjust to the new reality of global warming. On the other hand, if Congress points the way and provides the necessary funding, the United States can maintain our leadership in the stewardship of wildlife and ecosystems for future generations.

Conclusion

The National Wildlife Federation has worked for 70 years to advance non-partisan solutions to protect America's wildlife. The National Wildlife Federation is prepared now to work with Congress to advance science-based global warming solutions. We cannot sit back and wait when we know that solutions are within reach and that the time for grasping them is rapidly dwindling.

The Senate Environment and Public Works Committee has two bills pending before it—the Global Warming Pollution Reduction Act (S. 309) and the Climate Stewardship and Innovation Act (S, 280)—that will put us on the pathway needed to solve global warming. The bills are led by several environmental champions who sit on this Committee. We urge all Senators on the Committee to work together on global warming as your top priority and to move such bills out of Committee expeditiously for full Senate action.

Thank you again for your attention to global warming's impacts on wildlife. There is no more important conservation issue for our children's future than global warming.

Attachments
NWF 2006 Hunter/Angler Survey
Letter to Congress re State Wildlife Grant Program Funding
Agenda for a Clean Energy Future to Combat Global Warming

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