NATIONAL WILDLIFE FEDERATION

INSPIRING AMERICANS TO PROTECT WILDLIFE FOR OUR CHILDREN'S FUTURE.

Fact Sheet

PROTECTING AND RESTORING WILDLIFE HABITAT

The Clean Air Act: 40 Years of Protecting Wildlife from Pollution

Carl Heilman

This fall the Clean Air Act turns forty and Americans have much to celebrate. For four decades, the Clean Air Act has protected people from the harmful effects of air pollution. In its first 20 years alone, the Clean Air Act prevented:

- 205,000 premature human deaths
- 18 million child respiratory illnesses
- 672,000 cases of chronic bronchitis
- 843,00 asthma attacks
- 189,000 cardiovascular hospitalizations
- 21,000 cases of heart disease. [1]

Since the Clean Air Act was amended and strengthened in 1990, the public health benefits of the legislation have increased. Preliminary analyses suggest that programs implemented after the 1990 reforms will have prevented 160,000 premature deaths by the end of 2010. Importantly, public health protections under the Clean Air Act go hand in hand with strong economic benefits. The Environmental Protection Agency (EPA) estimates that by 2007, the environmental technology industry had generated $282 billion in revenue and 1.6 million jobs.[2]

The Clean Air Act is both an effective public health program and a successful environmental program. From New York's Adirondack State Park, whose lakes are threatened by acid rain, to California's San Bernardino National Forest, where trees are sickened by ozone, the Clean Air Act is essential for protecting America's precious wildlife and wild places from air-borne pollution.

Photo: The Clean Air Act has helped protect the Adirondacks from Acid Rain.

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How the Clean Air Act Protects Our Wildlife & Wild Places

Low Altitude Ozone: Ozone, a primary component of smog, is created when oxidized nitrogen and volatile organic compounds react in the presence of sunlight. Both of these chemicals come from burning fossil fuels, meaning that vehicles are a main source of ozone pollution. As ozone has increased from pre-industrial levels, it has not only increased the smog in our air, but also damaged forests throughout the Eastern United States and California. Atmospheric ozone affects tree species that are important to the American culture and economy including: white pine (a major source of lumber and Christmas trees), quaking aspen (one of the largest living organisms and most widespread tree in the country), and black cherry (highly prized for fine furniture).

Ozone can hurt trees in many ways. Depending upon the species, ozone may kill needles, cause leaf tissue to die, interfere with photosynthesis stunting growth, and make trees more susceptible to infection by pests like the bark beetle. As a result, trees weakened by ozone damage can't compete and may have reduced survival. In the Los Angeles area, high levels of automobile-generated ozone pollution have sickened and killed pines in the San Bernardino National Forest, changing its composition.[3]

Aspen

The Clean Air Act has been important to helping San Bernardino and other forests hurt by ozone. Since 1980, nitrogen oxide emissions have fallen more than one-third and volatile organic compound emissions have fallen one fifth, leading to comparable reductions in ozone.[4] Despite the success of the Clean Air Act in reducing ozone levels, it will take a long time for forests to recover. Furthermore, despite a national trend towards decreasing ozone concentrations, ozone damage is still being found in new sites and ozone levels are increasing in some important natural areas such as Sequoia and Death Valley National Parks.[5]

Mercury: Mercury, another pollutant regulated under the Clean Air Act, is harmful to fish and wildlife when it is released into the atmosphere from incinerators and coal burning power plants. Mercury pollution is transported across the landscape and deposited onto our land and waters where it slowly poisons wildlife as it works its way up the food chain. As algae and insects are eaten by fish and birds, the amount of mercury consumed by and accumulated in each successive organism gets larger and larger. While an insect or small fish might have only a little mercury, mercury in birds, mammals and large fish at the top of the food chain may reach dangerous levels from the many smaller animals they consume.

Many different types of wildlife are affected by mercury accumulation including otter and mink, fish-eating birds like bald eagles and insect-eating birds like red-wing blackbirds.[6] The effects of mercury poisoning on wildlife are dramatic. Fish affected by mercury may reduce time feeding and become emaciated or, worse, may suffer from brain lesions and death.[7] Common loons with high mercury levels experience hormonal changes, decreased motor skills and decreased reproductive success.[8] Mercury also has a range of devastating impacts on human health, affecting the central nervous, reproductive, and cardiovascular systems of both children and adults. In many lakes and rivers across the country, anglers can't eat what they catch because of unsafe levels of mercury in the fish. Furthermore, the FDA advises children and pregnant women to not eat shark, swordfish, tilefish, or king mackerel and only eat albacore tuna once per week to avoid accumulating dangerous levels of mercury.[9]

Mercury continued

Since 1990, US mercury emissions have decreased from 222 metric tons annually to 103 metric tons in 2003, mostly due to restrictions on medical waste and municipal incinerators. Studies show that when mercury levels are reduced from smokestacks, wildlife benefits. For nine lakes in New Hampshire, mercury levels in common loons decreased by half when local emissions were cut by 45%.[10] Similar effects were found in fish from a lake in Wisconsin; when mercury levels declined in a local lake, mercury concentrations in fish declined by 30%.[11] These studies show that when significant steps are taken to reduce mercury emissions in some ecosystems, wildlife can benefit in a very short time-frame.

Despite reductions in incinerator emissions, mercury levels are still three times those of pre-industrial levels and mercury accumulation remains a large problem. In a study of fish tissue (1998-2009) from a representative sample of 500 lakes in the United States, mercury was found in every fish sample it is estimated that mercury levels in fish exceed EPA safe levels in about 50% of lakes.[12] Fortunately, the EPA has the opportunity to improve enforcement of the Clean Air Act and protect wildlife from mercury when it proposes new rules regulating mercury from coal plants in 2011.

Brook trout die from acidification of lakes during spring snow-melt. Mercury levels in common loons decrease when mercury contamination in lakes decreases.

Acid Rain: Like mercury, acid rain affects all animals in an ecosystem from aquatic plants to fish, birds and mammals. Acid rain is created from sulfur dioxide, nitrous oxides and ammonia emissions from power plants and other sources. It is particularly problematic in the Northeastern United States, where the Adirondacks have experienced decreasing biodiversity and abundance of plankton, macroinvertebrates, and fish. In the Adirondacks, increasing acidity ten times eliminates half of fish species from lakes and in some lakes, acidity may eliminate fish altogether.[13] Acid rain also affects forests. Acidification reduces the ability of red spruce to survive winter cold; half of the red spruce in Vermont and the Adirondacks have died since the 1960s.[14] Acid rain may interact with other factors to kill sugar maples, the source for maple syrup and an iconic tree of the northern forest.[15]

Reducing acid rain has been one of the most dramatic successes of the Clean Air Act. Since the Act's passage, sulfur emissions have decreased nearly half and, since the 1990 amendments, nitrogen dioxide emissions have decreased nearly a third.[16] In 2010, the EPA reported that acid deposition in the Northeast and Midwest has decreased by more than 30%.[17] Furthermore, Clean Air Act regulation of acid rain has been a huge economic success. EPA estimates that the Acid Rain program has produced about $122 billion in health and natural resource benefits, at a cost of just $3 billion. Overall, benefits outweigh costs forty to one.[18]

Despite the great strides the Clean Air Act has made to protect fish and wildlife from acid rain, the problem is not solved yet. While some lakes are starting to recover chemically, it will take decades for soils to recover.[19]

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Clean Air Act: Protecting People and Wildlife in a Warmer World

Polar Bear and Pika

Now, more than ever, the Clean Air Act will be an important tool as we face the pollution challenges of the 21st century: greenhouse gases and climate change. Greenhouse gases, from large polluters such as cars and smokestacks, pose an enormous threat to our health and to our wildlife. Scientists predict that in a warmer climate, allergies and respiratory problems like asthma may worsen and that diseases may be more easily transmitted.[20] Global warming is melting arctic sea ice rapidly and is the primary factor threatening polar bear populations and leading to its listing under the Endangered Species Act. Many other species—from ocean-dwelling coral, to mountain-top mammals like pika, to the sage grouse of the intermountain west – are already experiencing global warming impacts. The Supreme Court ruled in the landmark case *Massachusetts v. EPA (2007)* that the EPA has both the legal authority and obligation to crack down on global warming pollution under the Clean Air Act.

For forty years, Americans and wildlife have benefitted tremendously from the Clean Air Act. Human health benefits are substantial and the Clean Air Act has made great strides towards safeguarding ecosystems for future generations. However, the first forty years of the Clean Air Act are just a starting point for continued work. We need to support the Clean Air Act and encourage the EPA to enforce it and keep reducing pollutants like mercury, ozone, and acid rain, all of which directly threaten our wildlife heritage. Although the nation's fish and wildlife are on the road to recovery, we need to work hard to ensure that recovery remains on track and the Clean Air Act is an essential tool for reducing the pollution that threatens future generations of both people and wildlife.

For more information visit www.nwf.org/cleanairact

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