

Climate Change Mitigation Fact Sheet: Mass Audubon Leading by Example



At Mass Audubon, we're taking steps to reduce our carbon footprint, and we hope to inspire our members and visitors to do the same. We want to do our part to reduce our carbon emissions from fossil fuel consumption in order to help prevent the worst effects of climate change.

Since 2003, Mass Audubon has reduced its annual carbon emissions from its buildings and vehicles by more than 50 percent. We've made improvements in several key areas:

Conserving Energy in Our Buildings



Following the advice of energy experts who conducted audits at 30 Mass Audubon locations, we have significantly reduced energy consumption in Mass Audubon buildings, many of which were built more than 50 years ago. We have cut our use of electricity and of natural gas, propane, and heating oil by:

- Increasing or replacing building insulation and sealing air leaks in almost all of our 150 heated buildings. As a result, we have reduced annual consumption of heating oil by 22,000 gallons per year, or 40 percent of baseline consumption.
- Upgrading old, inefficient heating systems in many buildings.
- Replacing all refrigerators and freezers manufactured prior to 1995 with **Energy Star** approved models.
- Replacing approximately 2,500 incandescent light bulbs with more efficient compact fluorescent light bulbs. Starting to install even more efficient light-emitting diode (LED) bulbs at some sites.
- Replacing air conditioners and dehumidifiers at 13 sites with **Energy Star** approved models.
- Replacing more than 200 desktop and laptop computers with **EPEAT** Gold-rated equipment.
- Replacing all less-efficient computer monitors with LCD and LED monitors and installing energy-saving surge protectors for all desktop computers.
- Reducing the number of servers and increasing the energy efficiency of our remaining servers.

Buying Electricity Generated from Renewable Sources



Purchasing green electricity is one of the easiest and most cost effective ways to quickly reduce your carbon footprint.

Mass Audubon has eliminated all carbon emissions from electricity use. Since 2009, all Mass Audubon sites have been purchasing green electricity through our electric

utilities and the non-profit organization Mass Energy.

One hundred percent of electricity used at Mass Audubon properties comes from non-fossil fuel sources, with two-thirds purchased from the vendors listed above and one-third generated on-site from Mass Audubon's own photovoltaic arrays. You can learn more about greening your own electricity at

www.massenergy.org/renewable-energy

Generating Renewable Energy



At Mass Audubon, we believe that the development of green, renewable energy sources will be an important factor in reducing carbon emissions and mitigating the destructive effects of climate change.

At all of our sanctuaries with nature centers, we generate electricity by using photovoltaic arrays, which harness energy from the sun. These arrays are both helping us to reduce our carbon footprint and serve as demonstration

models for visitors.

Highlights of our efforts include:

- Producing more than 318,000 kilowatt-hours (kWh) of electricity per year.
- Photovoltaic arrays at 20 locations. These 35 photovoltaic arrays produce almost one-third of Mass annual electricity needs.
- Solar thermal (water heated directly by sunlight) for domestic hot water at staff residences at three sanctuaries.
- Solar thermal water heating for the shower house at Camp Wildwood, as well as the campground shower house, dormitories, and nature center at Wellfleet Bay.
- One geothermal heating/cooling system at Boston Nature Center's George Robert White Education Center. The building has no furnace or air conditioning equipment; all heating and cooling is provided by the geothermal system, which uses water drawn from deep wells to heat and cool the building.

Replacing Vehicles



The Environmental Protection Agency estimates that 28 percent of carbon emissions in the U.S. come from transportation. Improving the way we get around is an important factor in reducing emissions.

Mass Audubon has:

- Replaced all 10 sedans in our 70 vehicle fleet with more-efficient Prius hybrids.
- Increased the number of meetings held via teleconference or video-conference instead of in-person as a way to cut back on how many miles our staff members drive.
- Installed an electric vehicle charging station at Joppa Flats Education Center in Newburyport.

Conserving Water



Water conservation is a key environmental concern in our state and all over the planet. Water is a vital resource for human and animal consumption, agriculture, industrial production, and ecosystems, and it is important to ensure that there's enough to go around.

Cleaning water and moving it through our cities and towns also requires a huge amount of energy. According to the Environmental Protection Agency, drinking water and wastewater systems account for 3-4 percent of energy use in the U.S. and produce 45 million tons of greenhouse gases annually.

At Mass Audubon, we have taken steps to reduce our water consumption by:

- Replacing 130 older toilets with models that use 1.6 gallons of water or less per flush.
- Replacing 121 toilets with dual flush toilets, which have two-way handles that can flush with different amounts of water depending on the waste to be removed.
- Installing 6 waterless urinals.
- Installing waterless Clivus Multrum composting toilets at four sites.
- Replacing washing machines and dishwashers at multiple sites with **WaterSense** and **Energy Star** models.
- Using rainwater stored in a cistern to flush toilets at the Joppa Flats nature center.

Enhancing Energy and Sustainability Education



Every person can play a role in reducing carbon emissions. Mass Audubon seeks to educate members and visitors about ways to promote a sustainable lifestyle by:

- Providing education programs on sustainability, clean energy, and climate change at many Mass Audubon wildlife sanctuaries.
 - Establishing interpretive green “trails” and interpretation of green building features at seven wildlife sanctuaries.
 - Installing data acquisition systems for almost all of our photovoltaic arrays so that visitors to our website can view our electricity production data and the carbon emissions avoided.
- Installing interactive solar sculpture at Drumlin Farm.

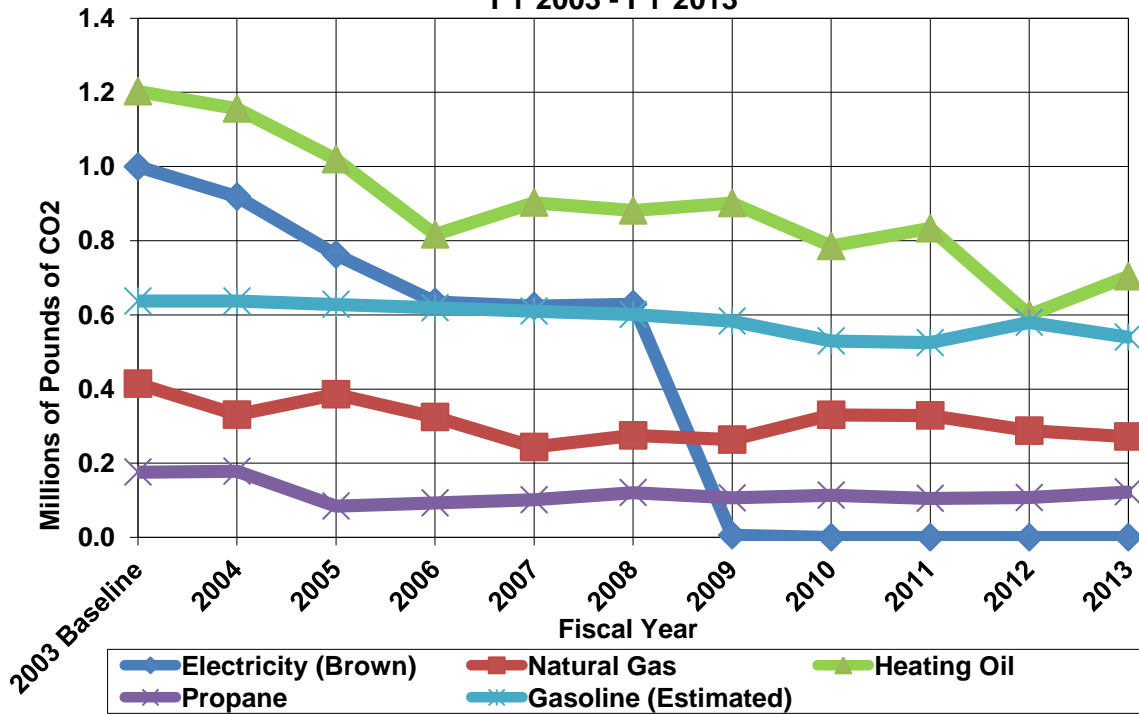
Other Sustainability Projects



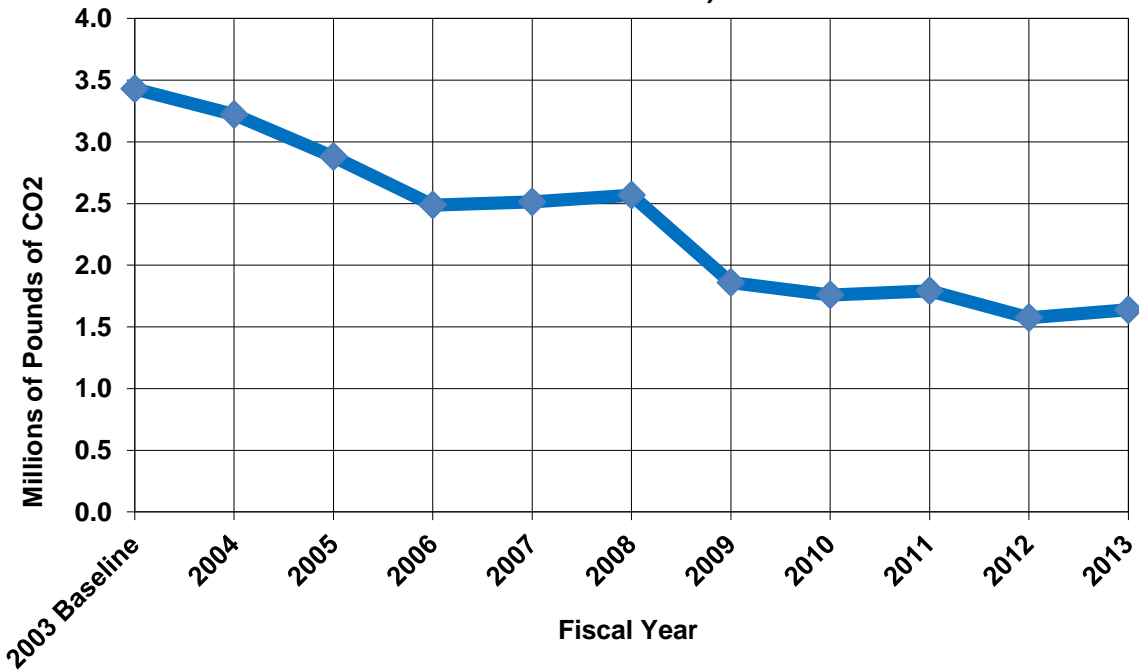
Mass Audubon is trying to be a leader in reducing its environmental impact in other ways. Examples of these sustainability projects include:

- Careful recycling of outmoded electronic products
- Minimizing use of pesticides and other toxic chemicals
- Recycling and food waste composting at many sites
- Installing bottle filling stations for visitors at seven sanctuaries to encourage use of reusable water bottles
- Community Supported Agriculture and community gardens in operation at four sites in order to promote locally-grown food
- Rain gardens and innovative storm water management systems installed at several sites
- Reducing our own use of bottled water
- Paperless paychecks to all regular staff to reduce solid waste

**Massachusetts Audubon Society
Carbon Footprint by Fuel Source
FY 2003 - FY 2013**



**Massachusetts Audubon Society
Overall Carbon Footprint for Buildings and Vehicles
FY 2003 - FY 2013)**



For Further Information

Mass Audubon staff and volunteers can contact Bancroft Poor, Vice President for Operations (bpoor@massaudubon.org), for overall information about our carbon emissions efforts. Nikki McKoon, Manager of Administrative Operations (nmckoon@massaudubon.org), has been in charge of Mass Audubon's energy and water conservation efforts. Stu Weinreb, Director of Capital Assets and Planning (sweinreb@massaudubon.org) leads Mass Audubon green building projects. Many other staff members have been involved in sustainability efforts at Mass Audubon and can also be helpful.