

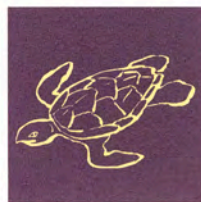
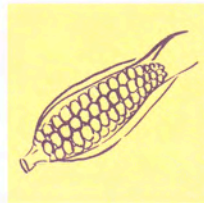
WHAT YOU CAN REALLY DO
FOR THE ENVIRONMENT

LIVING WITH
BIODIVERSITY



BIODIVERSITY AND WHAT YOU BUY

A Guide for Green Consumers



Center for Biodiversity and Conservation
American Museum of Natural History

SHOPPING FOR A HEALTHIER PLANET

Our everyday choices about what to buy and where to shop have a major effect on the environment. When combined with billions of consumer choices being made around the world 365 days a year, the impact is dramatic. What we buy affects not only the demand for the Earth's natural resources; but also how these resources are manufactured into products, and how they are discarded. By learning about the consequences of what we purchase, we can start making shopping decisions that will protect the planet.

Did you know that:

If every American household bought just one roll of toilet tissue made from 100% post-consumer fiber, we would save 375,000 trees.

What is the connection between what we buy and biodiversity?

When we buy a T-shirt, drink coffee, or read the newspaper, we consume products that come from nature. This connection is often hidden, since we are far removed from the origins of everyday things. But the Earth's biological diversity, from rainforests to oceans and the species that live within them, provides the raw materials that sustain human life.

GENETIC DIVERSITY. The ultimate source of the planet's biodiversity, genetic variation enables species to adapt to an ever-changing environment, and to combat predators and disease. The flow of genes from wild relatives provides the basis for medicine, industry, and food. For example, modern corn, which is used in 197 food products, clothing, drugs, and cosmetics, was decimated by a fungus in 1970; genetic material from the wild helped breed resistance to the fungus into the corn crop.

SPECIES DIVERSITY. The sheer diversity of plants and animals provides a wealth of consumer goods. Cotton is not only the source of fabric, but is used in over 50 products like book bindings, nail polish, and plastic; snakes, frogs, and many plants are a source of current medicines and a storehouse of potential remedies. In fact, 57% of our leading 150 prescription drugs have their origins in nature. Many food plants rely on other species to survive; over 80% of cultivated plants, like squash and blueberries, are pollinated by insects. Others rely on natural parasites and predators that provide billions of dollars of free pest control.

ECOSYSTEM DIVERSITY. A rich variety of ecosystems provides life's basic necessities and luxuries. The production of meat, milk, wool, and leather depend on healthy grasslands for livestock. Seafood, shellfish, and beach vacations rely on aquatic ecosystems that are free of pollutants. Functioning ecosystems produce fertile soil to grow plants, and enable bacteria and fungi to ferment products like yogurt, wine, pickles, and soy sauce. Ecosystems also support life by replenishing oxygen, purifying water, decomposing waste, and regulating the climate.

Product packaging makes up nearly 50% of our garbage by volume. Shampoo bottles, toothpaste tubes, yogurt containers, and other packaging can last centuries longer than what came inside of them.

How does what we buy affect biodiversity?

From shoes and T-shirts, to bottled water and computers, producing the things we buy is using natural resources faster than they can be replaced. More people than ever are competing for these resources as 250,000 people are born every day. Consumption on this scale is causing widespread ecological degradation, and in many cases, the extinction of species.

HABITAT LOSS. As consumer demands place pressure on the Earth's natural resources, habitats are being converted to grow crops, build homes, and create roads. In the U.S., over 250 million acres of forest have been cleared for pasture; shopping malls have grown twelvefold in the past three decades. In the last 30 years, building new homes and businesses in New York City's tri-state area has consumed one million acres of land.

OVEREXPLOITATION. Millions of plants and animals are sold as pets, jewelry, and medicines, leading to rapid declines in many species. In the U.S., illegal wildlife trade grosses \$5 billion a year. Overfishing is also threatening the diversity of the world's oceans; swordfish and Atlantic salmon are among the species most imperiled. If fishing for Atlantic salmon stopped today, the species would take at least 20 years to recover.

Exploiting the world's forests for paper and other products eliminates habitat and reduces the capacity of the forest to absorb CO₂, protect watersheds, and hold soil in place. Worldwide, over 60% of forested lands have been cleared; four billion trees are cut each year to produce paper alone.

"EXOTIC" SPECIES. Large numbers of people travelling and shipping products are introducing thousands of exotic species into new environments, killing off native species and threatening their habitats. An Asian fungus eradicated the American chestnut; European purple loosestrife is invading wetlands in New York City's suburbs. Over 4,500 exotics are thriving in the U.S. and may cause over \$100 billion in losses in the next 50 years.

POLLUTION. When certain products are manufactured, fossil fuels – like coal, oil, and natural gas – are burned, releasing pollutants into the soil, air, and water, threatening plants, animals, and humans. Four industries – paper, plastics, chemicals, and metals – account for nearly three-fourths of the toxic emissions from U.S. manufacturing. The loss of wetlands and riparian habitats has increased the impact of non-point source pollution, like runoff from landfills and roads.

GLOBAL WARMING. Through our consumption, excess amounts of heat-trapping gases are being added to the atmosphere, mainly CO₂. The Earth's ability to absorb CO₂ is declining; as a result, the temperature has risen 1°F this century alone. Automobiles, trucks, and buses are responsible for as much as 25% of the CO₂ emissions in industrialized countries; today, there are nearly 200 million motor vehicles in the U.S. and over half a billion worldwide.

The average resident of an industrial country consumes three times as much freshwater, ten times as much energy, and nineteen times as much aluminum as someone in a developing country.



■ What does "post-consumer" content mean?

Post-consumer refers to all of the materials that pass through consumers' hands on the way to the waste stream. For example, a newspaper that has been read and recycled is post-consumer waste. Turning this waste back into "raw" materials saves valuable nonrenewable resources and eases the burden on our landfills. Using recycled materials to manufacture products also reduces pollution; a paper mill can reduce its air pollution as much as 75% by using waste paper, rather than virgin pulp. Check packaging labels for the highest post-consumer content.

TEN SIMPLE WAYS TO

1

Buy what you need

Reject wasteful consumption by rethinking what you really need. Be aware of the endless flood of advertisements – over 3,000 each day – that manipulate your buying decisions. Before you buy, ask yourself: What natural resources were used to make this product? How much energy was needed to transport it? Is the packaging biodegradable?



2

Buy products made locally

The farther a product has travelled to reach you, the more pollution it generated. Check labels to see where products were made. Buy local produce from farmers' markets, which saves energy and reduces the need for packaging. Look for produce that is in season and does not need to be shipped great distances; for New Yorkers choose squash, cabbage, and kale in winter.

3

Choose products with minimal packaging

Over 200 billion bottles, cans, and plastic cartons and cups are thrown away worldwide every year. Choose glass and metal, which are more easily recyclable. Avoid Styrofoam and plastic. Request less packaging; do not "double-bag" groceries; bring your own bag or choose recyclable paper ones. Avoid items with layers of packaging, like small juice boxes and pump toothpaste dispensers.



4

Watch what you eat

Producing meat uses three times as much fossil fuel as growing vegetables and grains. Reduce your intake of beef and pork, which are the most resource-intensive. In the U.S., over four million cattle graze on 280 million acres of public land. Buy certified organic food, which promotes the use of natural pest controls; three billion pounds of pesticides are now used worldwide for agriculture.



5

Reuse and recycle

Slow wasteful consumption by reusing things and recycling them. Return wire hangers to your dry cleaners. Creatively reuse at least part of an item. Reuse plastic carry-out containers; or ask for aluminum ones. Use holidays to get rid of disposable excess. Wrap gifts in paper bags or newspaper. Reuse boxes and mailing envelopes.

Did you know that:

Each week, the average American consumes the equivalent of 300 shopping bags filled with natural resources.

Did you know that:

By 2005, nearly 150 million personal computers will have been sent to landfills.

Did you know that:

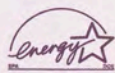
In Staten Island, New York, more than three billion cubic feet of garbage has been dumped in the Fresh Kills Landfill this century, creating one of the continent's largest man-made structures.

MAKE A DIFFERENCE

6

Buy low-impact products

Buy products with low environmental impact. Choose fuel-efficient cars over sports utility vehicles or minivans, which are less efficient and have lower pollution controls. Buy clothing made from organic cotton, or hemp, and "phosphate-free" soaps and detergents. Check efficiency ratings on new appliances. Look for the Energy Star™ label on new TVs, VCRs, and computers.



7

Look for durable products

Buy products that last longer. Every year, Americans throw away over two billion disposable razors alone. Reassess your "throw-away" mentality. Look for products that can be repaired and maintain the ones you own. Even shoes last longer if they are taken care of. Avoid disposable products like plastic utensils, plates, and cups.



8

Use fewer trees

Americans spend nearly \$2 billion a year on tropical hardwood products, like furniture and wood paneling. When buying wood, ask how it was grown. Look for Smartwood or Green Cross labels on wood products, which indicate that the wood comes from a well-managed forest. Avoid disposable products, like wooden chopsticks. Buy tree-free paper made from hemp, kenaf, or old money.



9

Avoid products made from endangered species

Ask if souvenirs and other items came from endangered plants and animals. In the Caribbean, beware of jewelry and trinkets made from black coral or from turtle shells, which probably came from endangered hawksbill turtles. Avoid plants and animals taken from the wild. Do not buy orchids, tropical fish, or birds unless you know where they came from. When traveling, observe restrictions on the transport of plants and animals.

10

Get involved locally

Join local groups that promote resource conservation. Participate in community discussions about protecting the parks and natural areas in your city. Support actions that protect biodiversity. Patronize businesses in your area that promote environmental protection; visit Green Apple Map's website at www.greenmap.com/nyc to find "green" products in New York City.

Did you know that:

Discarded plastic kills over one million birds and more than 100,000 marine mammals every year.

Did you know that:

Americans throw away over 18 billion disposable diapers, 2.7 billion batteries and 7.5 million TV sets every year.

FOR MORE INFORMATION

BOOKS

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- Durning, Alan T. and John C. Ryan. 1997. *Stuff: The Secret Lives of Everyday Things*. Seattle, WA: Northwest Environment Watch.
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- Hollender, Jeffrey. 1995. *How to Make the World a Better Place: 116 Ways You Can Make A Difference*. New York: W.W. Norton & Company.

WEBSITES

- Council on Economic Priorities
www.cepnyc.org
- National Wildlife Federation
www.nwf.org
- TRAFFIC
www.traffic.org
- World Resources Institute
www.wri.org
- Worldwatch Institute
www.worldwatch.org
- World Wildlife Fund Forests for Life
www.wwf.org/forests/

ORGANIZATIONS

- Center for A New American Dream**
6930 Carroll Ave., Suite 900
Takoma Park, MD 20912
Tel: 301-891-ENUF
Website: www.newdream.org
- Co-op America**
1612 K Street NW, Suite 600
Washington, DC 20006
Tel: 800-58-GREEN
Website: www.coopamerica.org
- Environmental Defense Fund**
257 Park Ave. South
New York, NY 10010
Tel: 212-505-2100
Website: www.edf.org
- The Nature Conservancy**
1815 North Lynn St.
Arlington, VA 22209
Tel: 800-628-6860
Website: www.tnc.org
- Natural Resources Defense Council**
40 West 20th St.
New York, NY 10011
Tel: 212-727-2700
Website: www.nrdc.org
- New York City Department of Sanitation**
Sanitation Action Center
125 Worth St.
New York, NY 10013
Tel: 212-219-8090
Website: www.ci.nyc.ny.us/strongest
- Rainforest Relief**
P.O. Box 150566
Brooklyn, NY 11215
Tel: 718-398-3760
Website: www.envirolink.org/orgs/rainrelief

The Center for Biodiversity and Conservation at the American Museum of Natural History is dedicated to bringing science-based solutions into the conservation process and to fostering public discourse on biodiversity conservation issues.

Support for the Center for Biodiversity and Conservation is provided by The Starr Fund for Biodiversity and Conservation, established by The Starr Foundation, and by other generous foundations, corporations, and individuals.

Center for Biodiversity and Conservation
American Museum of Natural History
Central Park West at 79th Street
New York, NY 10024-5192
Tel: 212-769-5742
Fax: 212-769-5292
Email: biodiversity@amnh.org
<http://research.amnh.org/biodiversity/>

The content for this resource guide came out of a program held at the American Museum of Natural History entitled "Biodiversity and What You Buy." The program, sponsored by the Center for Biodiversity and Conservation, was part of a four-part series on "Living with Biodiversity: What You Can Really Do for the Environment" and featured the following speakers:

Alisa Gravitz is the Executive Director of Co-op America, publisher of the *National Green Pages: A directory of products and services for people and the planet*.

John Ryan is Research Director for the Northwest Environment Watch. He is co-author of *Stuff: The Secret Lives of Everyday Things* and author of the *Seven Sustainable Wonders of the World*.

Jim Tripp is General Counsel for the Environmental Defense Fund and Co-chair of the Citywide Recycling Advisory Board.

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BIODIVERSITY AND YOUR ENERGY USE

A Guide for Green Consumers



Center for Biodiversity and Conservation
American Museum of Natural History

KEEPING THE PLANET “GREEN”

We rarely think about energy use in environmental terms. Yet, the way we use energy resources has a profound effect on the quality of the environment. For most people, fossil fuels are the primary energy source, enabling us to turn on the lights, cook food, and watch television. Tragically, burning these fuels is threatening the habitability of the planet. Through wiser energy use, we will not only promote a healthier environment, but will have time to develop “greener” energy alternatives.

Did you know that:

Since 1950, the Earth’s population has doubled, and the amount of fossil fuel burned for energy has quadrupled.

Where does our energy come from?

All of our energy sources are ultimately derived from natural processes. The sun, the original energy source, provides life for plants and animals that become fossil fuels, and heats the Earth, creating renewable resources like wind and water power.

FOSSIL FUELS. Coal, oil, and natural gas are fossil fuels that formed from the remains of organisms living millions of years ago. These resources – finite and nonrenewable – are extracted from the Earth and burned to create energy. It took nearly a million years to produce the fossil fuels we consume in one year. The U.S. uses fossil fuels for 85% of its energy. At the rate they are being burned, coal reserves are estimated to last 130 to 200 years; natural gas, 60 to 120 years; and oil, 30 to 50 years.

NUCLEAR AND HYDROELECTRIC POWER. These energy sources generate nearly one-third of the electricity in the U.S. Nuclear power, while cleaner than fossil fuels, poses serious safety hazards. One nuclear plant can generate over 30 tons of highly radioactive waste annually. The mid-Atlantic region, including New York, uses nuclear power for nearly 40% of its electricity.

RENEWABLE ENERGY. Renewable, or “green,” energy sources are regenerated by natural processes. The sun, wind, oceans, heat from the Earth (geothermal power), and plant matter (biomass) provide renewable energy that has less environmental impact than other sources and can last indefinitely. The U.S. Department of Energy estimates that renewables could provide up to 70% of our total energy within the next 40 years; now, they provide only 2%.

Where are we using the most energy?

IN OUR HOMES. The average new home has grown by a third since the 1970s, requiring more energy to heat and cool. Of growing concern is the proliferation of energy-hungry features like central air-conditioning, home office equipment, and security systems. In apartments, electric lighting and appliances use the most energy.

ON THE ROAD. With people driving more than ever, energy use from motor vehicles is rising quickly. The increase in minivans and sport utility vehicles, which get fewer miles per gallon and have less stringent pollution controls than smaller cars, is beginning to reverse decades of gains.

AT WORK. Energy use has been rising in corporate offices, partly due to an increase in electronic equipment.

In the past decade, Brazil was the world’s fourth largest carbon emitter, releasing several hundred million tons of CO₂ each year from deforestation.

How does our energy use affect biodiversity?

Our use of fossil fuels directly impacts the planet's biodiversity. When we drive, or use electricity, we burn fossil fuels, emitting gases like carbon dioxide and sulfur dioxide into the air. These gases, now building up in the atmosphere, are transforming the environment. In fact, if the level of carbon dioxide keeps increasing, the Earth will warm over the next century, resulting in widespread environmental changes. In the last 100 years, the level of carbon dioxide has increased by 25%.

ACID RAIN. Sulfur dioxide and nitrogen oxide, released when fossil fuels burn, combine with moisture in the air to form acids that fall as rain. The U.S. emits more of these gases than any other country. Acid rain contaminates water, and kills plant and animal life. It is harshest on soil, ponds, and lakes whose pH can be naturally low, particularly in the far eastern and western U.S. Acid rain has damaged trees along most of the Appalachians; 25% of the lakes, streams, and ponds in the Adirondacks are too acidic to support fish life.

AIR POLLUTION. Fossil fuel combustion produces several major air pollutants, like carbon monoxide and nitrogen oxide. Motor vehicles, the main source of carbon monoxide emissions, are the primary air polluter in New York City, where nearly two million automobiles are registered. Air pollution inhibits plant growth and can affect wildlife that depends on plants for food and habitat.

GLOBAL WARMING. Carbon dioxide and other gases trap heat in the atmosphere, allowing the Earth to absorb radiation from the sun in a natural process called the "greenhouse effect." Excess amounts of carbon dioxide may be causing an increase in the Earth's temperature, which has risen 1° F in the last century. If predictions are accurate, and greenhouse gases double in the coming century, the Earth's average temperature could rise between 3° and 8° F, leaving the Earth warmer than at any time in human history.

Such climate change will have profound ecological impacts, altering entire ecosystems. Among the most serious will be the flooding of coastal wetlands as sea levels rise, eliminating habitats and eroding coastlines. The whole balance of the migratory process, particularly for birds, could be thrown off as temperature changes affect food availability along migratory routes. At least one-third of the world's forests could be seriously affected by global warming; up to 40% of the boreal forests in Alaska, Canada, and Russia might be lost, pushing species like the Siberian tiger into extinction.

SOIL AND WATER POLLUTION. Every year, nearly one out of every 1,000 tons of oil produced ends up polluting the oceans and killing marine life. Coal mines leach chemicals into rivers, lakes, and underground reservoirs, contaminating drinking water and ecosystems. Oil and natural gas drilling also produce heavy metals, toxins, and radioactive wastes, which can enter the food chain.

Every year, the typical American home releases more than eight tons of CO₂ into the air through its use of electricity and heating fuels.



■ What could global warming mean for New York?

This last century, temperatures in Albany have warmed 1° F and statewide precipitation has increased nearly 20%. By the year 2100, even warmer, wetter conditions could prevail. New York's diverse ecosystems, from coastal marshes to mountain forests, may be affected by everything from sea level rise to fires and disease outbreaks, like malaria. Coastal wetlands could be flooded, beaches eroded, and algal blooms could damage aquatic habitats. The state's dominant trees would likely change. Maples, beeches, and birches would retreat northward; the maple's brilliant fall foliage could give way to oaks, ash, and pines.

TEN SIMPLE WAYS TO

1

Unplug your gadgets

Items like home entertainment systems, fax machines, hand-held vacuums, and portable tools draw power even when they are not "on."

Together, they can use more power than a refrigerator. If your equipment is hooked up to a remote control, it is drawing power round the clock. Be sure to turn these items off.



2

Buy products that are made locally

In one year, New Yorkers buy nearly 24,000 tons of broccoli, imported mainly from the West

Coast at a cost of \$6 million in transportation alone. Cargo ships, airplanes, and trucks burn enormous amounts of fossil fuels to deliver goods. Buy produce from local farmers' markets and check labels on packaged goods to see if they are made locally.



3

Use "green" transportation

Use mass transit, ride a bicycle, or walk to reduce the demand for fuel. For every gallon of gasoline saved, you prevent the release of 20 pounds of CO₂. When buying a new car, look for good gas mileage. In New York City, if you take a taxi, share, or look for natural gas taxis; the "Clean Air" sticker is on the side of the car. More than 3,000 natural gas vehicles, including taxis and buses, are already on the City's streets.

4

Replace bulbs with compact fluorescents

Buy compact fluorescent bulbs, four times more efficient than standard incandescents. A 27-watt compact fluorescent gives off the same light as a standard 100-watt and lasts 10,000 hours longer. They cost more, but create enormous long-term savings. And, turn off lights not in use; using one kilowatt-hour of electricity emits over a pound of CO₂.



5

Use energy-efficient appliances

The biggest home energy users are refrigerators, water heaters, air-conditioners, washers, and dryers. Ten large power plants could be eliminated if every American household had the most energy-efficient refrigerators available. When purchasing appliances, check efficiency ratings; look for the EPA/Department of Energy's new Energy Star™ label, for the most efficient TVs, VCRs, computers, air-conditioners, and refrigerators.



Did you know that:

Humans generate 24 billion tons of CO₂ each year; only half this amount is absorbed by natural processes.

Did you know that:

Fuelwood provides nearly one-third of the energy needs of developing countries.

MAKE A DIFFERENCE

6

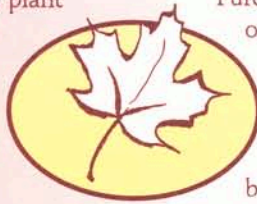
Adjust your thermostats

American home heating systems dump over a billion tons of CO₂ into the air each year. Turning down the thermostat even 2° prevents the release of 500 pounds of CO₂. When buying room air-conditioners, look for energy-efficiency ratings (EER) over 10. Apartment-dwellers should talk to their super about improving the building's insulation and lowering thermostats.

7

Make small home improvements

Nearly 25% of your home's heating and cooling can be lost through windows and doors. Weather-strip door and window frames, or caulk joints and edges, and save up to 10% on your energy bills. Clean vents and radiators to prevent dust from blocking heat. Outdoors, plant broadleaf shade trees native to your area to cool rooms in summer and to absorb CO₂.



8

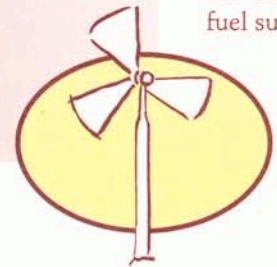
Buy products low in petroleum

Manufacturing oil-based products, like plastic, uses fossil fuels and yields toxic waste. Minimize your use of plastic and other petroleum products. Buy food and other products in bulk to reduce the use of plastic packaging. Purchase cotton, silk, or wool products, rather than those made from synthetics, which can be petroleum-based.

9

Reduce, reuse, and recycle

Americans throw away enough wood and paper to heat five million homes for 200 years. What we don't realize is that making new products from raw materials is far more energy-intensive than using recycled ones. Buy products made from recycled materials; check the package for post-consumer content. Buy durable products and reuse items, like plastic containers, to save energy resources.



10

Support renewable energy

Consumers need to speak out to make green power a reality. In New York City, "green" choices will slowly become available through the deregulation of utilities. As more people choose "green" power, "dirty" power plants may close. Be a part of public discourse on issues like increased fuel-efficiency for motor vehicles and fossil fuel subsidies.

Did you know that:

The U.S. consumes more energy per person than any country in the world; with only 6% of the world's population, it uses almost 30% of the world's energy.

Did you know that:

In New York City, the energy used in an 800-square-foot apartment can release as much as 11,000 pounds of CO₂ in one year.

FOR MORE INFORMATION

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- Wilson, Alex and John Morrill. 1998. *Consumer Guide to Home Energy Savings*. Washington, DC: American Council for an Energy-Efficient Economy.

WEBSITES

- Center for Renewable Energy and Sustainable Technologies
www.crest.org
- Environmental Protection Agency
www.epa.gov/globalwarming/
- EPA/DOE Energy Star Program
www.energystar.gov
- Sierra Club
www.toowarm.org
- Transportation Alternatives
www.transalt.org
- World Wide Fund for Nature
Climate Change Campaign
<http://www.panda.org/climate/climate.htm>

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ORGANIZATIONS

- The Alliance to Save Energy**
1200 18th St. NW, Suite 900
Washington, DC 20036
Tel: 202-857-0666
Website: www.ase.org
- American Council for an Energy-Efficient Economy**
1001 Connecticut Ave. NW, Suite 801
Washington, DC 20036
Tel: 202-429-8873
Website: www.aceee.org
- American Wind Energy Association**
122 C St. NW
Washington, DC 20001
Tel: 202-383-2500
Website: www.econet.org/awea
- American Solar Energy Society**
2400 Central Ave., G1
Boulder, CO 80301
Tel: 303-443-3130
Website: www.ases.org/solar
- Energy Efficiency and Renewable Energy Clearinghouse**
Department of Energy
P.O. Box 3048
Merrifield, VA 22116
Tel: 800-DOE-EREC
Website: www.eren.doe.gov/consumerinfo
- Natural Resources Defense Council**
40 West 20th St.
New York, NY 10011
Tel: 212-727-2700
Website: www.nrdc.org
- Union of Concerned Scientists**
P.O. Box 9105 Two Brattle Square
Cambridge, MA 02238
Tel: 617-547-5552
Website: www.ucsusa.org

The Center for Biodiversity and Conservation
American Museum of Natural History
Central Park West at 79th Street
New York, NY 10024-5192
Tel: 212-769-5742
Fax: 212-769-5292
Email: biodiversity@amnh.org
<http://research.amnh.org/biodiversity/>

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Nancy Cole is the Program Manager for the Union of Concerned Scientist's Sound Science Initiative, and is co-author of *Renewables are Ready: People Creating Renewable Energy Solutions*.

Nathanael Greene is an Energy Policy Analyst at the Natural Resources Defense Council where he develops regulations and policies for renewables, energy efficiency, and utility restructuring.

John Morrill is Director of Operations for the American Council for an Energy-Efficient Economy and is co-author of the *Consumer Guide to Energy Savings*.

WHAT YOU CAN REALLY DO
FOR THE ENVIRONMENT



LIVING WITH
BIODIVERSITY



BIODIVERSITY AND YOUR FOOD

A Guide for Green Consumers



Center for Biodiversity and Conservation
American Museum of Natural History

EATING TO PROTECT THE EARTH

What we eat and the foods we buy dramatically influence the health of the environment. It is not just individual acts that can be harmful; it's our collective actions over time that threaten the Earth's incredible diversity of life — its biodiversity. As consumers, we play a vital role in shaping how our food is produced and what foods are available. Making small changes in our food choices is one of the simplest ways we can protect the Earth.

Why is biodiversity important in what we eat?

From fruits and vegetables to fish and poultry, the Earth's biodiversity is the source of our food supply. We rely on the variety of life for our basic nutritional needs. But biodiversity is also important in several, less obvious ways:

POLLINATION. One of the Earth's most vital processes, pollination is necessary for fruit and vegetable production. Bees and other insects, birds, bats, and other small mammals pollinate 75% of the world's staple crops. In the United States, nearly 90% of the most valuable crops are fertilized by insects.

HEALTHY SOIL COMMUNITIES. The productivity of our agricultural lands depends upon the fertility of the Earth's topsoil. This thin layer of Earth — only 15 centimeters deep — contains organic matter, nutrients, minerals, insects, microbes, worms and other elements needed for plants to survive. The health of the soil depends on this diversity of organisms. They break down and recycle organic matter, providing nutrients that enable crops, pastures, and forests to grow.

GENETIC VARIETY. Over thousands of years, people have domesticated some 12,000 wild plant species and 20 to 30 animal species, primarily for agricultural uses. But agriculture still depends upon wild relatives of domesticated species for genetic material that provides resistance to disease, enhances productivity, and improves adaptability to ever-changing environmental conditions.

NATURAL PEST CONTROL. Farmers around the world spend nearly \$25 billion annually on pesticides; however, natural parasites and predators, like some wasps and birds, provide an estimated five to ten times this amount of free "pest control." Without these wild species, pest damage would be catastrophic.

Did you know that:

Nearly 96% of the commercial vegetable varieties available in 1903 are extinct.

Did you know that:

One in every three mouthfuls of food we eat depends on pollination by bees and other animals.

What is biodiversity?

Bio = life Diversity = variety

Biodiversity is the spectacular variety of living things on Earth and the interdependence among them.

It exists at three basic levels: genes, species, and ecosystems.

How do our food choices affect biodiversity?

Our food choices affect biodiversity directly and indirectly. When you eat species that are overexploited, you contribute directly to their decline. When you buy foods produced in an environmentally-destructive way, you indirectly support biodiversity loss. This loss means more than just a declining number of species; it means the disruption of ecological processes and the extinction of relationships upon which we depend. Some of the effects on biodiversity include:

POLLUTION. Many of the Earth's most important species – pollinators and soil organisms – are threatened by toxic chemical sprays used on crops for pest control. Chemical pesticides and fertilizers also release harmful chemicals into the air, water, and soil. In fact, fertilizer that has washed into lakes and rivers is a major cause of water pollution.

SOIL EROSION AND CONTAMINATION. Many of the modern agricultural techniques we employ cause tremendous erosion and contamination of the Earth's topsoil. When we destroy or disrupt this soil community, we damage its fertility. The loss of fertility remains the greatest threat to the future of our agricultural land.

DIVERSION OF OUR WATER SUPPLY. Agricultural irrigation uses at least two-thirds of our nation's groundwater – our underground water supply – draining it faster than it can be replenished. This is particularly a problem in the western United States, where many of our crops are grown.

DECLINING SPECIES. Many species that are popular food items, like fish, have been declining in numbers. Fish are the only animals still hunted on a large scale and overfishing is a major threat to the diversity of ocean life. Overfishing not only depletes fish populations, but robs other marine animals of food. In fact, eliminating key species in the ocean can shift the makeup of whole communities of fish, impairing the healthy functioning of marine ecosystems. Swordfish, Atlantic salmon, and cod are among the species most threatened. Other marine species are declining as they are unintentionally killed during fishing operations, a process known as bycatch. Although changing fishing practices are beginning to reduce the bycatch of certain species, many are still in peril.

ENERGY COSTS. Our food choices also generate enormous energy costs as food is transported great distances to reach our dinner tables. In fact, the average American meal has traveled approximately 1,200 miles before it is eaten. Long-distance transportation results in fuel consumption and carbon emissions into the atmosphere.

PACKAGING. Food packaging, much of which is non-recyclable, ends up in our landfills and can take centuries to decompose. Packaging makes up more than 30% of the volume of solid waste in our landfills; we throw away 25 billion Styrofoam cups each year alone.

Why do we need biodiversity?
The Earth's biodiversity supports our basic needs by providing us with food, fiber, fuel, medicine, clean air and water.



■ What does “organic” really mean?

Organic refers to the way that agricultural products – both food and fibers – are grown and processed. While uniform standards are still being developed, an “organic” label on an item means it was produced using low-impact agricultural methods and materials. Organic foods use minimal processing and no artificial ingredients, preservatives, or irradiation. By using natural processes, organic farming restores and protects the soil, water, and air, and thus, conserves biodiversity.

TEN SIMPLE WAYS TO

1

Choose organic products

This is one of the most direct ways that you can help promote a healthier environment. Shop in farmers' markets, look for foods with an organic label in your local grocery store, and ask your local grocer to stock a variety of organic produce.



2

Buy produce that is grown locally

Not only will this help reduce transportation costs and energy consumption, but fruits and vegetables that travel short distances are less likely to have been treated with post-harvest pesticides. When you buy local produce, you also help local farmers.

3

Buy produce that is in season

Buying out-of-season produce, like strawberries in February, is incredibly energy-intensive. Not only has this produce been shipped great distances, generating enormous energy costs, but it may come from a country with less stringent pesticide regulations than the U.S. Buying produce that is in season can reduce these environmental costs.

4

Avoid eating overexploited species

Consider the consequences of your demand for certain foods. Let restaurant and store owners know about the choices you make. Learn about alternatives to swordfish and other depleted species. For instance, striped bass is on its way to recovery. To find out what is on the over-fished list, visit the National Marine Fisheries Service website at www.kingfish.ssp.nmfs.gov/sfa.



5

Draw on the Earth's biodiversity: eat a variety of foods

The variety of foods available in supermarkets does not reflect the planet's biological variety. In fact, nearly 90% of the world's food needs are supplied by just 20 crops. Draw on the Earth's biological diversity by eating a wide assortment of foods.



Did you know that:

Farmers around the world spend about \$25 billion annually on pesticides; less than 0.1% of these pesticides ever reach the target insects.

Did you know that:

For every pound of shrimp caught, an average of seven pounds of other sea life is killed.

Did you know that:

Over 2/3 of the world's fisheries are presently overexploited, fully exploited, or depleted.

MAKE A DIFFERENCE

6

Eat foods that are lower on the food chain

An extraordinary amount of land, water, and energy is used in producing meat products, resulting in large amounts of air and water pollution. Eating more fruits and vegetables ensures a high-fiber, low-cholesterol diet that is better for you and for the environment.



7

Buy products with minimal packaging

Try to avoid heavily packaged items, like those that are individually-wrapped, or those wrapped in Styrofoam or plastic. Buy foods in bulk to reduce the overall amount of packaging. When you take food home or order take-out, ask for your food to be wrapped in aluminum foil, not plastic or Styrofoam. Better yet, bring your own container for leftovers.



8

Choose paper or plastic, but not both

The best choice is a reusable cloth bag. Using a reusable bag just five times will displace the pollution caused by the manufacture of one disposable bag. If this is not possible, then opt for paper bags made from recycled fibers. Choose white or clear plastic bags over red, orange, or yellow plastic. Never use paper bags made exclusively from virgin timber.

9

Minimize your food waste

Avoid throwing away food by cooking only what you can eat and freezing your leftovers. Donate extra food to local homeless shelters or food banks. Consider composting to prevent waste from ending up in our landfills.



10

Precycle

Make environmentally-sound decisions *before* you buy. Think twice before accepting a bag if your purchase is small. Replace paper napkins and towels with cloth. Or buy paper products made from 100% post-consumer fiber. Be sure to reuse plastic cups, plates, and utensils.

Did you know that:

Packaging of food alone accounts for 6% of the energy consumption in the U.S.

Did you know that:

Food makes up about 10% of the garbage we send to landfills.

How many species do you eat for lunch?

It takes more than 40 different species to make a simple lunch – a tuna sandwich on whole wheat, potato chips, iced tea and an apple.

FOR MORE INFORMATION

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WEBSITES

- Greenmap/New York City
www.greenmap.com/nyc
- Organic Alliance
www.organic.org
- Organic Trade Association
www.ota.com
- Organic Trading and Information Center
www.organicfood.com
- National Organic Program
www.ams.usda.gov/nop
- U.S. Fish and Wildlife Service
www.fws.gov/r9endspp/endspp.html

ORGANIZATIONS

- Environmental Defense Fund**
257 Park Ave. South
New York, NY 10010
Tel: 212-505-2100
Website: www.edf.org
- Green Guerillas**
625 Broadway
New York, NY 10012
Tel: 212-674-8124
Website: www.greenguerillas.org
- Greenmarket**
Council on the Environment of NYC
51 Chambers St.
New York, NY 10007
Tel: 212-788-7900
Website: www.cenyc.org
- Just Food**
625 Broadway, #9C
New York, NY 10012
Tel: 212-674-8124 ext. 207
- Living Oceans Program**
National Audubon Society
550 South Bay Ave.
Islip, NY 11751
Tel: 516-859-3032
Website: www.audubon.org/campaign/lo/
- Mothers and Others for a Livable Planet**
40 West 20th St.
New York, NY 10011
Tel: 888-326-4636
Website: www.mothers.org/mothers
- Natural Resources Defense Council**
40 West 20th St.
New York, NY 10011
Tel: 212-727-2700
Website: www.nrdc.org
- New York City Department of Sanitation**
Recycling Program
P.O.Box 156, Bowling Green Station
New York, NY 10007
Tel: 212-837-8183

The content for this resource guide came out of a program held at the American Museum of Natural History entitled "Biodiversity and Your Food." The program, sponsored by the Center for Biodiversity and Conservation, was part of a four-part series on "Living with Biodiversity: What You Can Really Do for the Environment" and featured the following speakers:

Merry Camhi is a staff scientist at the National Audubon Society's Living Oceans Program, which is dedicated to conserving ocean wildlife.

Peter Hoffman is a board member of the Chefs Collaborative 2000, a group of gourmet chefs working to develop sustainable food choices for the next century. Mr. Hoffman is also chef/owner of the Savoy Restaurant in Soho.

Betsy Lydon is a program director of Mothers & Others for a Livable Planet, a consumer and environmental education organization. In 1996, Ms. Lydon was appointed by the United States Department of Agriculture as a consumer representative of the National Organic Standards Board.

The Center for Biodiversity and Conservation at the American Museum of Natural History is dedicated to bringing science-based solutions into the conservation process and to fostering public discourse on biodiversity conservation issues.

Support for the Center for Biodiversity and Conservation is provided by The Starr Fund for Biodiversity and Conservation, established by The Starr Foundation, and by other generous foundations, corporations, and individuals.

Center for Biodiversity and Conservation
American Museum of Natural History
Central Park West at 79th Street
New York, NY 10024-5192
Tel: 212-769-5742
Fax: 212-769-5292
Email: biodiversity@amnh.org
<http://research.amnh.org/biodiversity/>

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WHAT YOU CAN REALLY DO
FOR THE ENVIRONMENT



LIVING WITH
BIODIVERSITY

BIODIVERSITY AND YOUR WATER SUPPLY

A Guide for Green Consumers



Center for Biodiversity and Conservation
American Museum of Natural History

KEEPING IT CLEAN

We depend on the Earth's biodiversity for clean, available freshwater. Throughout time, the planet's healthy ecosystems and diversity of life have ensured the flow of pure freshwater. But, as the world population increases, so does the pressure on our water reserves. As individuals, we can play an active role in protecting this increasingly threatened supply. If we conserve life on the planet, and manage our water resources properly, freshwater can be a renewable resource for generations to come.

What is a wetland?

Wetlands are low places where land is perpetually or seasonally saturated. They are often transitional areas between land and water. Wetlands can be coastal, like mangroves, or inland, like swamps.

Why is biodiversity important for our water supply?

Healthy streams, rivers, lakes, and underground aquifers depend on a variety of organisms, including microbes, plants, and animals. This diversity of species and the interaction among them enables us to have clean, available water. The integrity of the Earth's ecosystems and natural processes is essential to the future of our water supply.

WATERSHEDS. These land areas that funnel water into rivers and lakes are fundamental to the Earth's hydrologic cycle. By connecting streams and rivers, lakes and ponds, groundwater and springs, watersheds enable small waterways to join together, creating larger ones that ultimately flow into the oceans. Not only do watershed processes control the amount and rate of water flow, they control the amount of sediment and dissolved materials running into these waterways. Watersheds also help replenish water supplies as rain and snow run off mountains and flow into tributaries that fill the reservoirs.

WETLANDS. Integral links in the hydrologic cycle, wetlands are essential to the health and stability of entire watersheds. Home to a remarkable variety of life, like bacteria, plants, and animals, wetland environments are largely responsible for cleaning water by absorbing heavy metals and toxins. Wetland communities filter water, and replenish and purify groundwater supplies. Wetlands also reduce flooding by acting as sponges, soaking up excess water and releasing it over time.

NATURAL FILTERS. Some species, like freshwater mussels, clarify water by filtering out the impurities. Up to 10 inches long, these mussels burrow into river bottoms. As they feed and breathe, incoming water passes across their gills where it is filtered and purified. The average mussel filters one liter of water every 42 minutes. About one-third of the world's freshwater mussel species—nearly 300 of them—are found in U.S. waterways.

Did you know that:

Nearly 250 million gallons of toxic industrial waste are dumped into U.S. rivers each year.

Did you know that:

Agriculture accounts for more than two-thirds of freshwater use worldwide.

How do our actions affect the water supply?

Every day our individual and collective actions affect the quality and quantity of our water. Each time we flush the toilet, the water used affects one or more aquatic systems. The more water we use, the more energy and chemicals are needed to deliver water to our homes. On a larger scale, when we deforest the land, dam and channel our waterways, and build on areas near watersheds, we contribute to a decline in our water reserves.

WETLAND LOSS. Over half of our original wetlands in the lower 48 states has been lost. This loss, primarily due to commercial and residential development, means not only less available groundwater and drinking water, but also that polluted water is no longer filtered. In some areas, as wetlands are lost, groundwater is replenished more slowly, increasing the chances of drought. Wetland loss increases the threat of floods and storm surges.

DECLINING SPECIES. When beaver populations declined over the last century, their dams collapsed, watersheds lost their wetlands, springs dwindled, and water quality changed for the worse. More critically endangered are freshwater mussels – now the most widely endangered family of organisms in the U.S. – two-thirds of which are at risk of extinction. When mussel beds disappear, our water flows unfiltered.

WATER POLLUTION. Industrial processes and growing urban populations have increased the amount of chemical pollutants, toxic waste, and sewage flowing into our waterways. At home, we unknowingly use many poisonous chemicals – to clean our floors, paint our walls, or wax our cars – that leach into our waterways.

DEFORESTATION. Without trees to anchor the soil, rivers and streams become clouded with excess sediments and contain less organic matter, less food, and fewer species. Soil sediments lower the oxygen supply in the water, destroy habitat, and kill aquatic life by clogging fish gills and suffocating fish eggs.

DEPLETION OF WATER RESOURCES. Water supplies can become depleted through agricultural irrigation, industrial manufacturing, and home use as well as by mining and wetland loss. In some areas, increases in impervious surfaces, like pavement, prevent groundwater from recharging, while increasing the runoff of toxic compounds.

POOR LAND-USE PRACTICES. Agriculture is one of the largest water polluters. Fertilizers and pesticides applied to agricultural lands can seep into groundwater or can be washed into nearby waterways. When we support agricultural producers who use chemical fertilizers and pesticides, we unwittingly contribute to this pollution.

DAMMING. When a watershed is dammed, reservoir-fed rivers replace natural, turbulent, oxygenated ones, changing their course and temperature, and blocking nutrient flow. These shifts can affect species that depend on free rivers, like sturgeon, salmon, and shad, which declined after damming.

By the time you leave for work in the morning, you have used nearly 100 gallons of water to shower, brush your teeth, flush, and shave.



■ Where does New York City's water come from?

New York City's water supply system is unique. It relies on three upstate watersheds – the Catskills, the Croton, and the Delaware – and their reservoir systems. Stretching across nine counties and covering nearly 2,000 square miles, these watersheds and their reservoirs supply New York City with more than 1.3 billion gallons of water every day. Rapid development on nearby lands threatens the system's outstanding water quality as increased runoff from roads, fertilizers and pesticides, and sewage discharge pollute the watersheds. Replacing natural filtration with a water filtration plant would cost nearly four billion dollars.

TEN SIMPLE WAYS TO

1 Reduce household pollutants

Avoid buying toxic household products. Look for a label on soaps, disinfectants, bleach, drain cleaners, and spot removers that says "no phosphates." Or use vegetable-based cleaning products and biodegradable detergents, available in most natural food stores. Do not dump hazardous chemicals, like painting supplies, lawn-care, or cleaning products down the drain. Follow disposal instructions.



5 Reduce, reuse, and recycle

Recycling reduces the need to use raw materials for making new products, a process which is not only water-intensive, but increases water pollution. For instance, producing 1 kg of paper can use as much as 700 kg of water. Many areas now have special drop-offs for hazardous waste and places to recycle batteries and motor oil. Call your local waste management department for more information. In New York City, call 212-837-8183.

8 Do not litter

Dispose of garbage properly to prevent toxins from seeping into the soil and waterways. Eliminate the use of chemicals, like pesticides, fertilizers, and motor oil, which can be carried by wind into storm drains and sewer systems, ending up in our lakes and rivers. Fix automobile leaks promptly to prevent runoff.

2 Conserve water at home

Turn off the faucet while you brush your teeth, wash your face, and shave, and conserve more than 20 gallons of water. Take quick showers. Store drinking water in the refrigerator rather than running the tap for cold water. Avoid using running water to defrost foods; refrigerate them overnight. Urge your landlord to install low-flush toilets, which can save five to seven gallons per flush. Use low-flow faucets and shower heads, which can cut water use in half. For water-saving devices, visit Co-Op America's website at www.coopamerica.org.

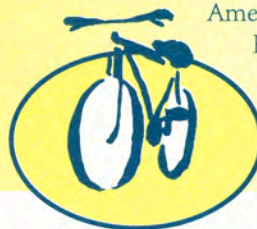
6 Drink less bottled water

Americans drink more than two billion gallons of bottled water a year, spending 900 times more than we do on tap water. The energy and pollution costs in shipping and packaging water are enormous. Often, this water is no safer than tap water, particularly in New York City, where water quality is high. Check with your local authority before switching to bottled water. Instead, use a filter in your water pitcher or on your faucet. If you must, use a home delivery service that brings refillable containers.

9 Conserve energy

Energy conservation lessens the use of fossil fuels and the resultant acid rain and water pollution. Use energy-efficient lighting and appliances to reduce the use of fossil fuels. Seek alternatives to driving. Use mass transit, ride your bike, or walk. For additional energy-saving ideas, contact the

American Council for an Energy-Efficient Economy at 202-429-8873 or www.aceee.org.



Did you know that:

The U.S. has the highest freshwater usage in the world – the average American family consumes nearly 300 gallons per day just at home.

Did you know that:

Today nearly half a billion people worldwide face water shortages. By 2025, that number will reach 2.8 billion.

MAKE A DIFFERENCE

3 Make low-impact food choices

Routine agricultural practices in the U.S. have contaminated groundwater in 26 states with more than 47 pesticides. Buy organic foods, whose production reduces the chemical runoff into our waterways. Eat less meat, particularly red meat, which requires enormous amounts of water to produce. It takes nearly 400 gallons of water to produce a pound of beef. Avoid wasting precious resources – buy only what you can eat.



4 Water plants and lawns in the evening

Outdoor water use accounts for half of the total amount of water consumed in the summer months. Wise use of water not only protects the environment, but provides for optimum growing conditions. Avoid losing water to evaporation by midday heat by watering in the evening. Buy plants native to your area that require less water such as wild geraniums, mountain laurel, and sedum.

7 Check for water leaks

Make sure you do not have a leak at home. If your faucet drips at the rate of one drop per second, you can expect to waste 2,700 gallons per year, adding to the cost of water and sewer utilities, or straining your septic system. Repair drips with new washers. If there is a public water main break or leaking hydrant in New York City, call the Department of Environmental Protection anytime at 1-718-DEP-HELP.



10 Get involved locally

Encourage your friends and neighbors to be part of a water-conscious community. Support community-based projects by joining their efforts to monitor water quality and threats to watersheds. Organizations like GREEN (734-761-8142) trains teachers, students, and businesses to be water stewards. Share your views about the importance of clean and abundant water with decision-makers.

The Earth is almost 70% water. Nearly 97.5% of this water is found in the oceans; and, a mere 2.5% is freshwater. Two-thirds of this freshwater is frozen in glaciers, one-third is groundwater, and less than 1/100th of 1% is freshwater habitat.

Did you know that:

Nearly 50% of U.S. endangered animals and one-quarter of endangered plants live in or rely on wetlands.

Did you know that:

Medical researchers have estimated that there are over 7.6 million cases of waterborne illnesses annually in the U.S.

FOR MORE INFORMATION

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- Postel, Sandra. 1997. *The Last Oasis: Facing Water Scarcity. The Worldwatch Environmental Alert Series*. New York: W.W. Norton & Company.
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WEBSITES

- American Rivers
<http://www.amrivers.org/>
- American Water Works Association
Water Efficiency Clearinghouse
<http://www.waterwiser.org>
- The Groundwater Foundation
<http://www.groundwater.org/>
- The National Drinking Water Clearinghouse
http://www.estd.wvu.edu/ndwc/ndwc_homepage.html
- National Energy Foundation
Water Wise & Energy Efficient Program
www.getwise.org
- U.S. Environmental Protection Agency
Office of Water
<http://www.epa.gov/OW/you/intro.html>
- U.S. Water News Online
<http://www.uswaternews.com/homepage.html>

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ORGANIZATIONS

Adopt-a-Stream

600 128th St. SE
Everett, WA 98208
Tel: 425-316-8592
Website: www.streamkeeper.org

American Littoral Society

Sandy Hook, Building 18
Highlands, NJ 07732
Tel: 732-291-0055
Website: www.bullitt.org/als.htm

American Rivers

1025 Vermont Ave., NW, Suite 400
Washington, DC 20005
Tel: 202-347-9224
Website: www.amrivers.org

Clean Water Action

4455 Connecticut Ave., NW, Suite A300
Washington, DC 20008
Tel: 202-895-0420

National Audubon Society

Wetlands Campaign
P.O. Box 462
Olympia, WA 98507
Tel: 360-709-9695
Website: www.audubon.org

Riverkeeper

Castle Rock Field Station
Route 9D
Garrison, NY 10524
Tel: 914-424-4149
Website: www.riverkeeper.org

Save the Sound

185 Magee Ave.
Stamford, CT 06902
Tel: 203-327-9786
Website: www.savethesound.org

Center for Biodiversity and Conservation
American Museum of Natural History
Central Park West at 79th Street
New York, NY 10024-5192
Tel: 212-769-5742
Fax: 212-769-5292
Email: biodiversity@amnh.org
<http://research.amnh.org/biodiversity/>

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John Cronin is the Hudson Riverkeeper, and is co-author with Robert F. Kennedy, Jr., of *The Riverkeepers*.

Melanie Stiassny is chair of the Ichthyology department at the American Museum of Natural History. Her research focuses on the conservation of fish in freshwater habitats.

Amy Vickers is a nationally-recognized water and conservation expert. She was the Water Team Leader for the Greening of the White House project, and is the author of the *Handbook of Water Use and Conservation*.